

MARCH 21-25, 2022

Research Appreciation Day 2022 VIRTUAL CONFERENCE

ABSTRACT BOOK



Gibson D. Lewis Library

presents

The University of North Texas Health Science Center's

RESEARCH APPRECIATION DAY 2022 ABSTRACT BOOK

ORAL PRESENTATIONS

Molecular characterization of human adipose-tissue derived stem cells (ASCs) from the breast in the presence and absence of exogenous estrogen

Abstract ID: UNTHSC372

Research Area: Cell & Molecular Biology

Presenter: Maria Artiles

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

- Maria Artiles
- Sara Al-Ghadban
- Bruce Bunnell

Abstract:

Purpose: Adipose-derived stem cells (ASCs) are multipotent cells of mesodermal origin with self-renewal and differentiation capabilities, isolated from adipose tissue. ASCs are located in adipose tissue depots throughout the body and maintained for life. Our group has extensively studied abdominal ASCs (aASCs) harvested from lean and obese individuals and how their contribution to the tumor microenvironment (TME) results in amplified breast cancer proliferation, tumorigenesis, and metastasis; in a series of processes that have been linked to leptin signaling cascades and estrogen-mediated pathways. Furthermore, these properties are exacerbated in aASCs from obese donors, which express increased levels of leptin and pro-inflammatory cytokines compared to those harvested from lean individuals. Of particular interest are ASCs located in breast adipose tissue (bASCs). These bASCs have unique immunomodulatory, antiinflammatory, and antioxidative properties. They serve essential endocrine functions in healthy breast tissue, but they also play a role in the development and pathophysiology of breast cancer, being a critical component of the breast cancer TME. While bASCs influence their microenvironment, they are also altered by physiological changes associated with obesity, the circulating levels of the sex hormones such as estrogen and progesterone, and the adipokine leptin. The fluctuations in estrogen levels before and after menopause are also accompanied by a shift in the accumulation site of subcutaneous adipose tissue. This study aims to characterize bASCs from human donors and compare their gene expression, proliferation, differentiation properties, and response to exogenous hormonal variations, to those of aASCs. Methods: bASCs were

characterized and compared to aASCs after being cultured in the presence or absence of exogenous estrogen. Adipogenic and osteogenic differentiation was induced and assessed with Oil Red O and Alizarin Red S staining, respectively. Alterations to colonyforming unit capabilities were assessed with crystal violet staining. Cell surface markers were evaluated using flow cytometry. The expression of hormonal receptors, adipogenic genes, and osteogenic genes was evaluated by real-time PCR and Simple Western. Results: bASCs display similar morphological characteristics, surface markers, colonyforming capabilities, proliferation potential, and differentiation potential to that of aASCs. However, bASCs express higher levels of hormone receptors and are more susceptible to changes in exogenous estrogen than aASCs. Conclusion: Given that hormone receptor positive breast cancers are more prevalent in obese women after menopause, while triple negative breast cancers (TNBC) are more common in obese pre-menopausal women, hormonal levels may play a role in the development of both hormone receptor-positive breast tumors and TNBC tumors by affecting the surrounding bASCs

Phosphorylated Annexin A2 at Tyrosine 23 Regulates Exosome Release and Biogenesis in Triple Negative Breast Cancer

Abstract ID: UNTHSC362

Research Area: Cancer

Presenter: Priyanka Prakash Desai

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

- Priyanka Prakash Desai
- Amit Kumar Tripathi
- Michael Donkor
- Srikantha Thyagarajan
- Harlan Jones
- Timothy Treuren
- Jana Lampe
- Panka J Chaudhary
- Jamboor Vishwanatha

Abstract:

Purpose: Exosomes are highly involved in the progression of diverse diseases. Targeting exosome biogenesis and release is a potential strategy for the treatment of the disease like cancer which urges an improved understanding of the process. During the exosomes biogenesis, invagination of the plasma membranes forms early endosomes which mature into late endosomes and multivesicular bodies. Annexin A2 (AnxA2), a calcium dependent phospholipid binding protein, is one of the cargo proteins which gets uploading into the exosomes and impart aggressive phenotype in triple negative breast cancer (TNBC). The mechanism how AnxA2 uploads the exosomal cargo into the exosomes and releases exosomes in the tumor microenvironment remains to be unidentified. In this study, we have explored the potential mechanism for exosome biogenesis and release to target it in TNBC, which lacks the targeted based therapies. Methods: Plasmids expressing constitutive phosphomimetic (AnxA2-Y23E) and nonphosphomimetic AnxA2 (AnxA2-Y23F) mutant gene were transfected in MDA-MB-231 cells. Exosomes isolated from AnxA2-Y23E and AnxA2-Y23F mutant cells were analyzed for expression of the exosomal cargo proteins and RNAs by Western blot and RT-PCR. The number of exosomes released were analyzed by Nanotrack analysis (NTA). Mutant cells treated with Rapamycin, mTORC1(Mammalian Target of Rapamycin Complex 1) inhibitor, were analyzed for the cargo and exosomal secretion. Mutant cells were injected in nude mice to generate tumors. Serum exosomes were isolated and analyzed for cargo and number of exosome release by NTA. Results: In this study, we found that phosphorylated Annexin A2 at tyrosine 23 increases exosome secretion. It loads proteins like AnxA2, CD9 (Cluster of Differentiation 9), LC3B, and Tsg101(Tumor susceptibility gene 101), and AnxA2 and mTOR mRNA into the exosomes. Moreover, secretion and loading of cargo into the exosomes is regulated by increased phosphorylation of AnxA2 and reduced downstream mTORC1 activity. Conclusions: Phosphorylation of AnxA2 at tyrosine 23 regulates exosome secretion and cargo loading into the exosomes in TNBC.

The association between prescribing patterns and type of primary care visit among older adults with polypharmacy: a cross-sectional study

Abstract ID: UNTHSC360

Research Area: Patient Safety

Presenter: Elias Arellano Villanueva

Submission Type: Oral Presentation

Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine

Classification: GSBS Student

Author(s):

- Elias Arellano
- Kimberly Fulda
- Yan Xiao
- Anna Espinoza
- Omair Muzaffar
- Noah Hendrix

Abstract:

Background: Primary health care has been vitally disrupted by the COVID-19 crisis. Changes in primary care delivery in COVID-19 present an opportunity to study how patients and primary care professionals have adapted to the crisis. With the wide adoption of telehealth modalities, understanding changes in prescribing practices among elderly patients could serve to reduce adverse drug events. With the ongoing adoption of telehealth services, there are concerns about the potential of inappropriate prescribing practices. Moreover, older adults who take more medications and require more monitoring than all other age groups could be disproportionately impacted by policies enacted to limit the spread of SARS-Cov-2. The complex care requirements of elderly patients with multimorbidity's heightened health care strains due to COVID-19, and medication errors can have significant negative health consequences on elderly patients. In this cross-sectional study, we looked for associations between prescribing practices and visit modality for adults with polypharmacy within primary care. Methods: Through post-visit surveys, we interviewed a total of 64 low-acuity patients \hat{a} 50 who were on more than 5 medications and were attended by a provider within the Family Medicine Clinic at HSC Health Clinic between June 2021 and August 2021. Of the 64 patients, that were interviewed, 32 had an in-person visit and 32 had telehealth visits with their providers. The providers were also asked to complete a survey about

their visit with the patient and the types of changes that were made during the consult. We looked for an association between the visit modality type and prescription changes through the following question: "@Did the total number of medicines or supplements change as a result of this visit" from the surveys provided by the providers. Logistic regression was used to look at the association between prescription changes & visit modality while controlling for age and gender. Results: Of the 64 patients that completed the survey, age (M = 66.66 years, SD = 9.57 years), gender included Female (n=50) and Male (n=14). Data for this study included adults who self-reported as White (n=43), Black or African American (n=19), Prefer not to Answer (n=1) and Unknown or not Listed (n=1). The association between prescription changes and visit modality was found to be non-significant (odds ratio [OR] .1.140; 95% confidence interval [CI] .417-3.115). This finding did not change even while adjusting for gender and age (adjusted odds ratio [OR] .820; 95% confidence interval [CI] .384-3.35). Conclusions: Prescription changes were similar between in-person visits and telehealth visits for adults ≥ 50 years who were on ≥ 5 medications while adjusting for gender and age. If differences between visit modality and prescribing changes were to be found other factors should be investigated. Given the need to reduce medication errors among older adults, providers can provide accessibility options through different visit modalities while ensuring consistency in medication changes.

Travel-Induced Stress at Varying Ages Modulates the Pathogenesis of Autoimmunity in Female Lupus Mice

Abstract ID: UNTHSC346

Research Area: Integrative Physiology

Presenter: Viet Dinh

Submission Type: Oral Presentation

Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Viet Dinh
- Sarika Chaudhari
- Keisa Mathis

Abstract:

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease that causes inflammation throughout the body, notably in the kidneys. Inflammatory flares that occur during the pathogenesis of SLE increase morbidity in humans and are associated with stress and environmental factors. Heat shock proteins (HSPs) are chaperone proteins that are elevated in the stressful conditions, especially HSP90 which is increased in subsets of SLE patients. HSP90 is also correlated with interleukin (IL)-6, a proinflammatory cytokine known to stimulate autoimmune processes in many diseases including SLE. The lupus mice used in our lab travel to our university from Bar Harbor, ME. However, it is not known if this travel period induces stress on these mice that significantly affects the pathogenesis of SLE and renal damage. Likewise, it is unknown if the age at which the mice travel also predicts outcomes of the disease. Based on this, we hypothesize that stressors that occur early in life have a greater impact on the pathogenesis of SLE and renal inflammation than stressors that occur during adulthood in lupus-prone mice. We used female NZBWF1 mice "" an established model of SLE "" that traveled to our university at 6 weeks of age (pre-pubertal stage) or at 19 weeks of age (mature adult stage) to compare the effects of travel at different ages of life. At 30 weeks of age, they were placed in metabolic cages weekly to collect urine samples. Upon reaching 35 weeks of age, a point at which these mice usually develop severe lupus symptoms, we collected blood samples, euthanized the mice, and collected tissues. Urine, plasma, and homogenized right kidneys were analyzed via ELISA to compare various biomarkers, including double-stranded (ds)DNA autoantibodies (a hallmark of SLE), urinary albumin (a marker of renal injury), IL-6, and HSP90. No

differences were found in plasma dsDNA autoantibodies between mice that traveled in younger life vs. in adulthood (Young: 6.0e5 ű 8.4e4 vs. Adults: 5.2e5 ű 7.6e4 U/mL; p=0.6930). Likewise, no differences were found in urinary albumin between these groups (Young: 1.2e7 ű 3.2e6 vs. Adults: 1.0e7 ű 8.4e6 ng/mL; p=0.8208). In mice that traveled as adults, IL-6 was significantly higher in plasma (Young: 195.8 ű 87.4 vs. Adults: 826.7 ű 130.0 pg/mL; p=0.0096) and in kidneys (Young: 177.1 ű 60.6 vs. Adults: 798.1 ű 166.5 pg/mL; p=0.0002). Levels of plasma HSP90 were lower in mice that traveled as adults (Young: 152.1 ű 23.4 vs. Adults: 65.70 ű 8.60 ng/mL; p=0.0302). In conclusion, our data indicate that mice subjected to travel-induced stress as adults developed higher levels of plasma and renal IL-6 and lower levels of plasma HSP90 at 35 weeks of age. We will continue to evaluate these outcomes in more mice and further data will expand on these findings, which will act as an important steppingstone for furthering our understanding of how environmental stressors play a role in the progression of autoimmunity well into adulthood.

Therapeutic Efficacy of ????7 Nicotinic Acetylcholine Receptor Positive Allosteric Modulators in Acute Ischemic Stroke

Abstract ID: UNTHSC335

Research Area: Neuroscience

Presenter: Katherine Hernandez

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

• Katherine Hernandez

Abstract:

Ischemic strokes are a leading cause of disability in humans, which can result in decreased motor function, impaired cognition, and emotional disturbances. Currently, there are only two approved treatment options available: administering a tissue plasminogen activator or performing a surgical thrombectomy. Both treatment options are limited by time constraints, making it difficult to treat stroke patients effectively. PNU 120596, a positive allosteric modulator of the alpha 7 nicotinic acetylcholine receptor (a7 nAChR), has previously exhibited increased motor function in male stroke model rats. However, research on the effects of this novel drug on female rats has not been conducted. We hypothesize PNU 120596 will improve both motor and cognitive function in female rats. We will study this using behavioral tests, such as Rotarod and Barnes maze, on a middle cerebral artery occlusion (MCAO) stroke in both male and female Sprague Dawley rats. Depending on these results, we will further confirm our findings using either Magnetic Resonance Imaging (MRI) or brain tissue staining to support or disprove our hypothesis.

CT-based assessment of lower limb surface area, volume, and tissue composition: Implications for ecogeographic rules of thermoregulation

Abstract ID: UNTHSC329 Research Area: Structural Anatomy Presenter: Clay Carey Submission Type: Oral Presentation Department: Center for Anatomical Sciences Classification: GSBS Student

Author(s):

- Barclay Carey
- Scott Maddux

Abstract:

Purpose: Anthropological research into human climatic adaptation has shown that global variation in skin surface-area to body volume (SA/V) ratio is generally consistent with theoretical predictions of ecogeographic rules. However, most studies have ignored the fact that internal body volume is comprised of various tissues (e.g., bone, muscle, fat) which exhibit different thermoregulatory properties. To address this issue, NSF has recently funded a research project in which human subjects will undergo full-body computed tomography (CT) scanning, and physiological testing during exposure to climatic extremes in an environmental chamber, to permit direct evaluation of associations between morphological variation and thermoregulatory physiology. Accordingly, the goal of the current project is to develop analytical methods for the NSF project, which will be used to 1) compare CT-derived SA/V ratios to traditional estimation methods, and 2) to evaluate potential volume differences in internal tissue compositions (e.g., bone, muscle, fat). Methods: 20 full body CT scans were selected from the New Mexico Decedent Image Database, a repository of CT scans made available to researchers by the New Mexico Office of the Medical Examiner. CT scan processing was performed in the Avizo software program. Appropriate anatomical landmarks were identified for segmentation of the hip, knee, and foot. The boundary between torso and lower limb is defined by a transverse plane between left and right greater trochanters. Separation of thigh and leg is defined by a similar plane between the medial and lateral midpoints of the knee on the tibial plateau. A final plane at the ankle passes through the medial and lateral malleoli. Identification of tissue types (bone, muscle, adipose) from the CT data began with generally accepted Hounsfield

unit (i.e., density) ranges. These threshold ranges include +400 HU and higher for bone, -29 to +150 HU for muscle, and -190 to -30 HU for adipose. Results: Landmarks employed to orient planes of anatomical division were found to be readily identifiable across all specimens, permitting accurate collection of surface area and volume data for each of the 4 regions of interest (lower limb, thigh, leg, foot). In contrast, the use of basic Hounsfield unit threshold ranges was not found to permit reliable differentiation between bones, muscle, and adipose tissues. In particular, thresholding rages for bone had to be substantially altered to account for density-related differences between cortical bone, trabecular bones, and bone marrow. Hounsfield unit ranges for muscle and adipose did not need as much adjustment, but selections required more manual segmentation for contouring and removal of scanning artifacts. Conclusion: The methods developed by this project allow differences in tissue composition to be accurately accounted for during assessments of body volume. Thus, these methods provide advantages over traditional volumetric methods which assume tissue uniformity, and consequently, are well positioned to facilitate future experimental research into the relationships between anatomical variation and thermoregulatory physiology.

Alzheimer's Disease Risk Allele Frequencies Differ Based on Ethnicity in HABLE Cohort

Abstract ID: UNTHSC275

Research Area: Aging / Alzheimer

Presenter: Mohammad Housini

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: Dual Degree Student

Author(s):

- Mohammad Housini
- Sumedha Rao
- Nicole Phillips
- Sid O'Bryant
- Robert Barber

Abstract:

Purpose: Alzheimer's Disease (AD) or other related dementias remain a significant burden on our aging population. Here we evaluate the top 10 AD risk alleles previously reported by Kunkle et al. (2018) in Mexican Americans and non-Hispanic whites enrolled in the Healthy Aging Brain in Latino Elders Study (HABLE) cohort to see if allele frequencies vary based on ethnicity. Methods: DNA was extracted from buffy coat samples (n = 1635) on the Hamilton robotic system with the Mag-Bind Blood & Tissue DNA HDQ 96 Kit. Genotyping was performed per manufacturer's protocol using the Illumina Infinium Global Screening Array (GSA) and analyzed with Genome Studio 2.0. Samples with call rates less than 98% were repeated or excluded. Allele and genotype frequencies were calculated using standard statistics by compiling the top ten AD risk alleles from Kunkle et al. (2018) and measuring their frequencies in the HABLE cohort. Results: Our data suggest varying degrees of allele and genotype frequencies among the top 10 risk conferring SNPs between Mexican Americans and Non-Hispanic Whites. In particular, we show some instances (BIN1, PTK2B) where the heterozygotes are in higher frequency than homozygotes. 8 of our evaluated SNPs show a difference greater than 5% between the two ethnicities. Conclusion: It may be beneficial to further study the top AD risk alleles among different ethnicities to determine if there are variable frequencies in those populations. We plan to expand and continue this work in other ethnicities and further elaborate on these differences to promote ethnicity targeted diagnostics and help reduce health disparities in medicine and science.

Inositol-requiring enzyme 1 alpha (IRE1 \hat{I} ±) at the int-ERsection of astrocyte-mediated neurotoxicity: Implications in (METH)amphetamine use and HIV-associated neurocognitive disorders

Abstract ID: UNTHSC255

Research Area: Cell & Molecular Biology

Presenter: Jessica M Proulx

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

- Jessica Proulx
- Kathleen Borgmann

Abstract:

Human immunodeficiency virus 1 (HIV-1) invades the central nervous system (CNS) early during infection and can persist in the CNS for life despite effective antiretroviral treatment. Infection and activation of residential glial cells leads to low viral replication and chronic inflammation, which damage neurons contributing to a spectrum of HIVassociated neurocognitive disorders (HAND). Astrocytes are the most numerous glial cells in the CNS and provide essential support to neurons to ensure CNS health and function. During a neuropathological challenge, such as HIV-1 infection, astrocytes can shift their neuroprotective functions to become neurotoxic and even serve as reservoirs for HIV-1 infection. Indeed, astrocyte-mediated neurotoxicity (astrogliosis) is a hallmark of neurodegenerative diseases and disorders provoking consequences such as neuroinflammation, oxidative stress, and glutamate excitotoxicity. Astrocyte responses that regulate these outcomes include increased release of inflammatory mediators, decreased metabolite and antioxidant provision, and impaired uptake of glutamate from the tripartite synapsis, respectively. Notably, substance use disorders, including (METH) amphetamine are disproportionately elevated among people living with HIV-1. METH use can induce neurotoxic and neurodegenerative consequences, which can increase one's risk and severity of HAND. Identifying cellular and molecular mechanisms underlying astrocyte-mediated neurotoxicity are of heightened importance to optimize the coupling between astrocytes and neurons and ensure neuronal fitness against CNS pathology, including HAND and METH use disorder. Mitochondria are

essential organelles for regulating metabolic, antioxidant, and inflammatory profiles. Moreover, endoplasmic reticulum (ER)-associated signaling pathways, such as calcium and the unfolded protein response (UPR), are important messengers for cellular fate and function, including inflammation and mitochondrial homeostasis. Increasing evidence supports that the three arms of the UPR are involved in the direct contact and communication between ER and mitochondria through mitochondria-associated ER membranes (MAMs). Our previous studies in primary human astrocytes demonstrated increased UPR/MAM mediator protein expression following HIV-1 infection or chronic METH exposure, of which, inositol-requiring enzyme 1 alpha (IRE1 \hat{I} ±) was most prominently elevated. Interestingly, pharmacological inhibition of the three UPR arms, illuminated that IRE1 \hat{I} + is a potential regulator of astrocyte mitochondrial respiration. Here, we further delve into the functional role of $IRE1\hat{I} \pm in$ primary human astrocytes using an IRE1 \hat{I} + overexpression plasmid followed by stimulation with proinflammatory cytokine, interleukin $1\hat{I}^2$ (IL- $1\hat{I}^2$). These conditions permit interpretations for both IRE1 \hat{I} + expression and activation as IL-1 \hat{I}^2 is a potent activator of ER stress. Our findings confirm IRE1 \hat{I} + modulates astrocyte metabolic function, morphological activation, cytokine secretion, and glutamate clearance, highlighting a novel target for regulating astrocyte metabolic and inflammatory phenotypes. Therapeutic targeting of astrocyte IRE1 \hat{I} + could help combat astrocyte-mediated neurotoxicity and potentially promote a more neuroprotective phenotype during CNS pathology.

Effects of Sustained Hypobaric Hypoxia on Amplitude of Forced Hemodynamic Oscillations During Central Hypovolemia

Abstract ID: UNTHSC227

Research Area: Integrative Physiology

Presenter: Garen K. Anderson

Submission Type: Oral Presentation

Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Garen Anderson
- Alexander Rosenberg
- Haley McKeefer
- Jordan Bird
- Brandon Pentz
- Britta Byman
- Nicholas Jendzjowsky
- Richard Wilson
- Trevor Day
- Caroline Rickards

Abstract:

Introduction: Forcing oscillations in arterial pressure and cerebral blood flow at 0.1 Hz during simulated hemorrhage protects cerebral oxygenation at both low and high altitude. Arterial pressure oscillations at 0.1 Hz are endogenously driven by rhythmic fluctuations in sympathetic nerve activity. As hypobaric hypoxia increases basal sympathetic activity, we hypothesize that the amplitude of forced oscillations in arterial pressure and cerebral blood flow during simulated hemorrhage will be greater at high altitude compared to low altitude. Methods: 8 healthy human participants (4 M, 24.7 $\hat{A} \pm 4.1$ y; 4 F, 34.3 $\hat{A} \pm 8.3$ y) underwent a hypovolemic oscillatory lower body negative pressure (OLBNP) protocol, where chamber pressure reduced to -60 mmHg then oscillated every 5-s between -30 mmHg and -90 mmHg over 10-min (0.1 Hz). This protocol was performed at both low altitude (LA; Calgary, Alberta, Canada; 1045 m) and high altitude (HA; White Mountain, California, USA; 3800 m). Mean arterial pressure (MAP), mean middle cerebral artery velocity (MCAv), and cerebral tissue oxygenation (ScO2) were recorded continuously. Frequency analysis (via continuous

wavelet transform) was used to quantify oscillations in MAP and mean MCAv at ~0.1 Hz. Data were analyzed with linear mixed-models and paired t-tests. All data are represented as mean $\hat{A}\pm$ SD. Results: Baseline amplitude of oscillations were similar between HA and LA for MAP (1.9 $\hat{A}\pm$ 0.6 mmHg vs. 1.2 $\hat{A}\pm$ 0.5 mmHg; P = 0.47) and mean MCAv (0.9 $\hat{A}\pm$ 0.4 cm/s vs. 1.1 $\hat{A}\pm$ 0.3 cm/s; P = 0.91). Oscillatory amplitudes increased with 0.1 Hz OLBNP and altitude for MAP (ANOVA main effect, OLBNP: P < 0.001, Altitude: P = 0.007) and mean MCAv (ANOVA main effect, OLBNP: P = 0.002, Altitude: P = 0.008). Amplitude of oscillations during OLBNP were greater at HA for both MAP (4.0 $\hat{A}\pm$ 2.1 mmHg vs. 2.6 $\hat{A}\pm$ 1.4 mmHg, P = 0.05) and mean MCAv (2.4 $\hat{A}\pm$ 1.1 cm/s vs. 0.9 $\hat{A}\pm$ 0.4 cm/s; P = 0.01). The relative ($\%\hat{a}^+$) decrease in ScO2 was not different between HA and LA (-0.63 $\hat{A}\pm$ 0.92 % vs. -2.56 $\hat{A}\pm$ 2.61 %, P = 0.11). Conclusions: Oscillatory amplitudes at 0.1 Hz in both MAP and mean MCAv increased during OLBNP at high altitude. This effect may be due, in part, to the sympathoexcitatory stimulus of hypobaric hypoxia, and does not alter the protection of cerebral tissue oxygenation in this environment.

Reprogramming of B16-F10 melanoma-educated macrophages by STING agonists loaded in mannose-decorated reconstituted high density lipoprotein nanoparticles.

Abstract ID: UNTHSC188

Research Area: Cancer Presenter: Akpedje Serena Dossou Submission Type: Oral Presentation Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Akpedje Dossou
- Ammar Kapic
- Lois Mamo
- Nirupama Sabnis
- Andras Lacko
- Rafal Fudala

Abstract:

Purpose: Representing a large portion of tumor-infiltrating cells, tumor-associated macrophages (TAMs) have the potential to mediate an immune response against the tumor. Instead, they are educated by the tumor microenvironment (TME) to display an immunosuppressive (M2) phenotype that favors tumor progression. The utilization of stimulator of interferon genes (STING) agonists to re-program TAMs to an immunostimulatory (M1) phenotype leads to tumor regression. However, the wholebody distribution of macrophages, the complex TME architecture, and low bioavailability at the TME are challenges to this therapeutic approach. The selective delivery of STING agonists by suitable nanoparticles can help address these challenges. Reconstituted high-density lipoprotein nanoparticles (rHDL NPs) are biocompatible, can penetrate the TME, and interact readily with macrophages. The scavenger receptor class B type 1 (SR-B1) mediates the intracellular delivery of rHDL NPs' payload. Since TAMs highly express scavenger receptors and the mannose receptor CD206, we hypothesize that mannose-decorated rHDL NPs will efficiently deliver STING agonists to TAMs for their repolarization to an M1 phenotype. Thus, the purpose of this study is to assemble and characterize mannose-decorated rHDL NPs and assess the ability of the formulation to

deliver STING agonists and polarize B16F10 melanoma-conditioned macrophages to an M1 phenotype. Methods: DSPE-PEG-Mannose (DPM) was used to introduce a mannose moiety onto the rHDL NPs. Two STING agonists (DMXAA, MSA-2) were loaded separately in the rHDL-DPM to form rHDL-DPM-DMXAA and rHDL-DPM-MSA-2. Dynamic light scattering, absorbance- and fluorescence-based measurements were used to evaluate the chemical composition and characterize the formulations. Murine macrophages incubated in B16-F10 melanoma-conditioned media served as an in vitro TAM model. Lipopolysaccharide + interferon-gamma- and interleukin-4 -treated macrophages respectively served as M1 and M2 macrophage references. Western blots and ELISA were used to assess the expression of M1 markers (CXCL10, HLA-DR) and M2 markers (CD36). Results: Similar characteristics, including size, were found for rHDL-DPM-DMXAA and rHDL-DPM-MSA-2. In addition to CD206 expression, B16F10conditioned macrophages show expression of M2 markers. M2 macrophages and B16-F10-conditioned macrophages showed a higher SR-B1 expression and higher uptake of the payload from rHDL-DPM NPs than M1 macrophages. Treatment with STING agonistloaded rHDL-DPM diminished CD36 expression and induced HLA-DR and CXCL10 expression in B16F10-conditioned macrophages. Conclusions: The above findings show that the rHDL-DPM NPs can serve as a delivery vehicle for both DMXAA and MSA-2 and potentially can be extended to other TAM-repolarizing drugs. The expression of SR-B1 and payload uptake by the B16-F10-conditioned macrophages validate the utility of rHDL-DPM NPs to efficiently target TAMs. In addition, the induced expression of CXCL10 could be beneficial for the recruitment of CD8+ T-cells when rHDL-DPM NPs are used in combination with T-cell-based immunotherapies to improve treatment outcomes for cancer patients.

Resistance Breathing and Sympathetic Nerve Activity During Simulated Hemorrhage in Humans

Abstract ID: UNTHSC185 Research Area: Integrative Physiology Presenter: Kenneth Austin Davis Submission Type: Oral Presentation Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Kenneth Davis
- Justin Sprick
- Victoria Kay
- Caroline Rickards

Abstract:

Purpose: Resistance breathing amplifies the respiratory pump during inspiration, so may be an effective intervention for treatment of hemorrhagic injuries. In animal studies of actual hemorrhage, and human studies of simulated hemorrhage, resistance breathing protects arterial pressure, and improves tolerance to this stress. Anecdotally, resistance breathing also increases the coupling between sympathetic nerve activity and arterial pressure. The impact of resistance breathing on overall sympathetic nerve activity, however, has not been examined. We tested the hypothesis that resistance breathing increases sympathetic nerve activity during simulated hemorrhage in healthy humans. Methods: Lower body negative pressure (LBNP) was used to simulate hemorrhage in five human subjects (3M, 2F; 29.2 \hat{A} ± 6.8 y). Two experiments were conducted (randomized order): 1) a control condition in which LBNP was applied at 3 mmHg/min until the onset of presyncope, and 2) a resistance breathing condition in which the same LBNP protocol was used, but subjects breathed through a resistance device (set at -7 cm.H2O) during the final stages of the protocol. Arterial pressure and muscle sympathetic nerve activity (MSNA) of the radial nerve were monitored continuously. Bursts frequency (bursts/min) and burst incidence (burst/ 100 heart beats) were used to quantify MSNA. Coupling between diastolic arterial pressure (DAP) and MSNA was assessed by transfer function analysis coherence within the low frequency range (0.04-0.15 Hz). Two-way repeated measures ANOVAs were conducted for assessment of responses in the control and resistance breathing conditions, between baseline and at matched time points late in the LBNP protocol. Results: While

LBNP induced increases in both MSNA burst frequency (P=0.003) and burst incidence (P=0.06), there was no effect of resistance breathing on MSNA for either index during LBNP (control, 57.9 ű 25.9 bursts/min vs. resistance breathing, 50.6 ű 21.7 bursts/min, P=0.99; control, 55.6 ű 25.6 b/100 heart beats vs. resistance breathing, 42.3 ű 18.3 b/100 heart beats, P=0.42). Additionally, there was no effect of resistance breathing on DAP (control, 73.2 ű 9.9 mmHg vs. resistance breathing, 72.8 ű 4.4 mmHg; P=0.99), or coherence between MSNA and DAP during LBNP (control, 0.53 ű 0.21 vs. resistance breathing, 0.69 ű 0.17; P=0.46). Conclusion: Contrary to our hypothesis, resistance breathing had no effect on sympathetic nerve activity during LBNP. A limitation of this study is the low sample size (N=5), and high variability of MSNA. Future investigations with a larger sample size are needed to determine if respiratory dynamics can influence the coupling between MSNA and arterial pressure.

Hyperbaric Oxygen Treatment improved Cognitive deficits in a mouse model of Alzheimer's Disease

Abstract ID: UNTHSC140

Research Area: Aging / Alzheimer

Presenter: Paapa Mensah-Kane

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: GSBS Student

Author(s):

- Paapa Mensah-Kane
- Philip Vann
- Delaney Davis
- Lad Dory
- Nathalie Sumien

Abstract:

Purpose: Alzheimer's disease (AD) is an economic burden affecting 40 million people worldwide and projected to increase to 120 million by the year 2050. Current approved treatments of AD only manage symptoms, involving anti-cholinesterase or NMDA antagonist. Seeking out new therapeutics and interventions that can reverse and alleviate the devastating effects of this disease has become paramount. Though a complex disease, there are major factors such as hypoxia, oxidative stress, and neuroinflammation that have been heavily involved in the pathogenesis of AD. Interventions that can reduce these two factors would likely reverse the progression of the disease. Hyperbaric Oxygen Therapy (HBOT), which has been used for the past 50 years for thermal burns, decompression sickness among other conditions, seems promising for neurological conditions such as traumatic brain injury and stroke. It has been shown to reduce inflammation and hypoxia. At the center of AD controversy also, is the relative vulnerability of the different sexes to AD. Whereas most studies in the US show no difference in incidence, studies in Europe have demonstrated a higher risk in women than men. On the contrary another study in United Kingdom reported men are at a higher risk. Thus, it has become more important to use both sexes in any study that seeks a successful treatment. Therefore, our aim was to explore whether HBOT can improve cognition in both male and female 5xFAD (AD model) mice. Methods: A total of 132 male and female 5xFAD and wildtype (WT) mice were randomly assigned to one of four experimental groups consisting of WT-HBOT, WT+HBOT, 5xFAD-HBOT and

5xFAD+HBOT. HBOT (O2 pressure at 2.4 ATA maintained for 90 min) daily (5 days/week) was started at 9-10 months and continued until the mice were euthanized at 12-13 months. Morris water maze test for spatial learning and memory, active avoidance T maze test for cognitive flexibility and fear conditioning test for associative learning were carried out at 1 month into the treatment with HBOT. Results: HBOT improved spatial learning and memory deficits in 5xFAD males but not in females. However, cognitive flexibility impairments were reversed with HBOT in 5xFAD females but not males. Also, HBOT improved associative learning in 5xFAD females, a deficit which was absent in males. Conclusion: This work does support HBOT as a viable option for reversing cognitive impairment associated with an AD phenotype with some sex differences depending on cognitive domain. Future work will seek to evaluate the mechanisms of action of HBOT including the possible involvement of epigenetics and sex differences, to help bring some clarity to the equivocal vulnerability of males and females to AD.

Suppression of Adaptive Immunity by Borrelia burgdorferi: An Investigation of Complex Host-Microbe Interactions

Abstract ID: UNTHSC109

Research Area: Immunology

Presenter: Megan Williams

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

- Megan Williams
- Yan Zhang

Abstract:

Purpose: Infection with Borrelia burgdorferi (Bb), the causative agent of Lyme Disease, induces broad suppression of the host adaptive immune response. It has been shown that short-lived germinal centers form in the lymph nodes shortly after infection, but then collapse approximately one month post-infection. The resulting adaptive immune response is characterized by unusually strong and persistent IgM production and lack of long-lived immunity. Additionally, when a group of Bb-infected mice were given a coadministered influenza vaccine, they mounted a significantly abrogated influenzaspecific antibody response when compared to an uninfected group that received the same vaccine. A better understanding of how Bb manipulates host immunity can help enhance serological testing and treatment options for Lyme Disease. We aim to determine the duration of humoral immune suppression by Bb and characterize the events leading up to germinal center collapse. Methods: We will randomly assign mice to 5 groups (n=4). One group will be inoculated with a SARS-CoV-2 spike protein vaccine. The remaining 4 groups will be infected with Bb and will subsequently receive the SARS-CoV-2 vaccine at Day 0, 14, 28, or 42. We have recently tested the safety of the vaccine for use in mice. This protocol has undergone IACUC approval (IACUC-2020-0033). We will assess the SARS-CoV-2-specific antibody response at different stages of infection with Bb, which will be measured using enzyme-linked immunosorbent assays (ELISA). We will also use genetic techniques such as RT-qPCR and single-cell RNA sequencing to interrogate the events underpinning this immune suppression. Results and Conclusion: This study has not yet been completed. Although conclusions cannot yet be drawn, preliminary evidence demonstrates that the SARS-CoV-2 vaccine is safe

for use in mice and induces a robust antibody response. We have recently successfully established infection in mice using Bb strain N40 and are currently examining lymph node histology of infected mice to confirm germinal center suppression in our infection model.

The effects of previous exposure to chronic methamphetamine on drug-seeking behavior and neurodegeneration in male and female mice

Abstract ID: UNTHSC108

Research Area: Neuroscience

Presenter: Delaney Davis

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: GSBS Student

Author(s):

- Delaney Davis
- Daniel Metzger
- Philip Vann
- Jessica Wong
- Ritu Shetty
- Michael Forster
- Nathalie Sumien

Abstract:

Purpose: Recreational and medical use of stimulants among young adults have gained popularity in the United States over the last decade, with amphetamine compounds becoming the second most common illicit drug used in college students. Although amphetamine stimulants have proven to be safe and efficacious in children and adults with Attention Deficit and Hyperactivity Disorder (ADHD) when used as prescribed, these drugs can have significant adverse side effects such as an increased potential of recreational abuse liability, dependence, and neurotoxicity. There are known sex differences in drug abuse, in which women have lower rates of illicit drug use, but use more of the drug, reach dependence faster and have more adverse effects. We hypothesize that females may be more vulnerable to the reinforcing effects of METH as well as METH-induced neurotoxicity and dopaminergic dysregulation. Our study investigated the effects of early chronic exposure to the prototypical stimulant, methamphetamine (METH), at a dose designed to emulate human therapeutic dosing, on abuse potential and biochemical markers of dopaminergic function and neurodegeneration in male and female mice. Methods: Groups of 4-month-old male and female C57BL/6J mice were administered non-contingent intraperitoneal injections of either saline or METH (1.4 mg/kg) twice a day for 4 weeks. METH (0.5 mg/kg)-induced

conditioned place preference (CPP) was tested in mice to determine the reinforcing effects of previous METH exposure. Mice were randomly assigned to either: Experiment I (short-term) in which male and female mice underwent CPP 13 days after injection cessation or Experiment II (long-term) in which female mice underwent CPP 5 months after injection cessation. Following behavioral testing, the animals were euthanized and striatum and midbrain were collected for biochemical testing of dopaminergic function and neurodegeneration. Results: In Experiment I, chronic METH exposure induced drug preference for subsequent doses of METH especially in males, and downregulated dopaminergic markers in males and induced apoptosis in females. In Experiment II, when CPP was performed 5 months after injection cessation, females with prior exposure to METH did not exhibit drug preference to subsequent doses of METH and there were no effects on markers of neurodegeneration or dopaminergic function. Conclusion: Previous exposure to METH induced a heightened sensitivity to subsequent doses of METH especially in males. While the effect in females was smaller, it disappeared in the long-term suggesting that this heightened sensitivity does not last over time. The increase in sensitivity was supported by alterations in the dopaminergic system in males. These outcomes suggest sex differences in response to prior METH exposure, and that these effects may not be long-lasting.

Aging impairs regulatory T cell (Treg) cells to affect lateonset (aged) multiple sclerosis (MS) - with the model of experimental autoimmune encephalomyelitis (EAE)

Abstract ID: UNTHSC101

Research Area: Immunology

Presenter: Weikan Wang

Submission Type: Oral Presentation

Department: GSBS: Microbiology, Immunology & Genetics

Classification: GSBS Student

Author(s):

- Weikan Wang
- Rachel Thomas
- Jiyoung Oh
- Dong-Ming Su

Abstract:

Purpose: A master immunoregulator FoxP3-expressing CD4+Treg cells play an ameliorative role in the severity of MS/EAE disease. However, it remains to be determined why severe MS/EAE symptoms and pathology in the aged are co-existing with relatively enhanced thymic CD4+Treg generation and accumulated peripheral CD4+Treg cells. Methods: We immunized young and aged mice to induce EAE and investigated the disease courses and Treg cell associated mechanisms. Results: The EAE onset was delayed in aged mice, but the disease severity is increased relative to young mice. Using single-cell (sc)-RNA-Seq assay, we found that CNS-infiltrating CD4+Treg cells in aged EAE mice had increased pathogenic properties, showing coexpression of Infg and Il17a with Foxp3, and reduced suppressive effect, exhibiting increased clonal expansion of pathogenic CD4+ T cells. These indicate pathogenic changes in Treg quality in aged EAE mice. In addition, CNS-infiltrating CD8+ T cells also gained increased Infg and II17a expressions in the aged EAE mice. Transient inhibition of aged peripheral FoxP3+ Treg cells mitigated the disease severity in the aged mice. The ameliorative effect was more significant when partially inhibiting FoxP3+ Treg cells with a drug P300i than completely depleting FoxP3+ Treg cells in FoxP3DTR transgenic mice. The mitigation is probably attributed to the correction of Treg cell distribution outside and inside the CNS. By inhibiting accumulated FoxP3+ Treg cells adhering to the brain's choroid plexus (outside the CNS), the IFN- \hat{I}^3 -producing cells can be restored, thereby, the impediment of immune cell trafficking into the inflamed CNS is

released in aged EAE mice. As a result, the proportion of myelin-specific CD4+Treg cells inside the CNS was increased for repairing neuroinflammatory damage. Conclusion: The underlying mechanism of severe MS symptoms in elderly patients is associated with the accumulation of Treg cells outside the CNS, which prevents the reparative antigen-specific Treg cells from entering the CNS during the disease.

Design and discovery of new tool compounds for studying the role of Slack potassium channels in malignant migrating partial seizure of infancy

Abstract ID: UNTHSC99

Research Area: Pharmaceutical Sciences

Presenter: Alshaima'a Qunies

Submission Type: Oral Presentation

Department: HSC College of Pharmacy: Pharmaceutical Sciences

Classification: GSBS Student

Author(s):

- Alshaima'a Qunies
- Brittany Spitznagel
- Yu Du
- C. Weaver
- Kyle Emmitte

Abstract:

Purpose: Slack channels are sodium-activated potassium channels encoded by the KCNT1 gene, and are key regulators of electrical activity in the central nervous system. Slack channels belong to the Slo family of potassium channels (Slo2.2). The development of malignant migrating partial seizure of infancy (MMPSI), a type of severe infantile epilepsy, has been linked to KCNT1 gain of function mutations. The aim of this project is to design and synthesize Slack channel inhibitors for use as in vivo probes via an iterative hit optimization approach. Methods: 110K-member library was screened in a cell-based assay against wild-type Slack and three MMPSI-associated KCNT1 mutants. The hit compound VU0531245 (VU245) was selected for the development of structure-activity relationship (SAR) studies in order to optimize its potency and drug metabolism and pharmacokinetic (DMPK) properties. A thallium flux assay in HEK-293 cell lines stably expressing Slack channels was utilized to evaluate Slack inhibitory activity of the resulting compounds. Results: Compound libraries were designed around VU245 through the systematic scanning of the chemical space and incorporating various bioisosteric replacements. Our data suggest that modifications at the phenyl ring A lead to mode switching from inhibition to activation. However, fluorinated, alicyclic, and deuterated alkoxy groups at 2-position of the phenyl ring maintained Slack inhibitory activity; moreover, they improved some DMPK properties. We have demonstrated that piperidine replacement at ring B was tolerated. In addition, an ethylene linker in place of the 1,2,4-oxadiazole ring at position C maintained the Slack activity. A 4-fluorophenyl ring at position D was tolerated, improved the metabolic stability, and was used as the basis for further SAR exploration. Finally, a sulfonamide linker was optimal for Slack inhibitory activity. Collectively, the tested analogs within this series demonstrated good passive permeability with no evidence of P-gp-mediated efflux; however, high protein binding (fu ~ 0.01 "`` 0.04) was observed. Conclusions: SAR for Slack activity and DMPK properties was identified around VU245. Further optimization is required to develop suitable Slack in vivo probes with improved potency and DMPK properties.

Acute Heat Exposure Improves Microvascular Function in Skeletal Muscle of Aged Humans

Abstract ID: UNTHSC52

Research Area: Cardiovascular

Presenter: Rauchelle Richey

Submission Type: Oral Presentation

Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Rauchelle Richey
- Holden Hemingway
- Amy Moore
- Albert Yurvati
- Steven Romero

Abstract:

Acute heat exposure improves microvascular function in the leg of aged adults as assessed using post-occlusive reactive hyperemia. However, reactive hyperemia measures whole-limb blood flow and cannot isolate perfusion among various tissues. Thus, it is unclear if the skeletal muscle circulation contributes to the improvement in microvascular function observed following acute heat exposure. We tested the hypothesis that acute hot water immersion would improve microvascular function in the vastus lateralis of aged adults. Seven aged adults (1 man, 71 \hat{A} ± 4 yrs) were immersed to the umbilicus for 60 min in thermoneutral (36 ŰC) or hot (40 ŰC) water. Body core temperature was measured via a telemetric pill. Two microdialysis probes were placed in the vastus lateralis ~30 min after immersion. Microdialysis was utilized to bypass the cutaneous circulation and directly assess endothelial-dependent and endothelialindependent microvascular function in skeletal muscle by measuring the local blood flow response to a graded infusion of acetylcholine (ACh, 27.5 and 55.0 mM) and sodium nitroprusside (SNP, 21 and 42 mM), respectively. Local blood flow was measured using the ethanol washout technique. Body core temperature increased by $\hat{I}''1.1 \hat{A} \pm 0.3 \hat{A}^{\circ}C$ during hot water immersion but was relatively unchanged during thermoneutral immersion ($\hat{I}''0.1 \hat{A} \pm 0.3 \hat{A}^{\circ}C$). Baseline skeletal muscle blood flow did not differ between thermal conditions for the ACh probe (P = 0.9), nor the SNP probe (P = 0.7). The hyperemic response to 27.5 mM ACh did not differ between thermal conditions (thermoneutral immersion, $\hat{I}''11.3 \hat{A} \pm 11.5 \text{ ml/min/100g vs.}$ hot water immersion,

Î"18.6 ű 16.8 ml/min/100g; P = 0.7). However, the hyperemic response to 55.0 mM ACh was increased with prior hot water immersion (thermoneutral immersion, Î"30.7 ű 16.9 ml/min/100g vs. hot water immersion, Î"56.2 ű 19.7 ml/min/100g; P < 0.01). Similarly, the hyperemic response to 21 mM SNP did not differ between thermal conditions (thermoneutral immersion, Î"16.9 ű 16.8 ml/min/100g vs. hot water immersion, Î"18.2 ű 18.8 ml/min/100g; P = 0.9), but was increased with prior hot water immersion during the infusion of 42 mM SNP (thermoneutral immersion, Î"29.3 ű 14.4 ml/min/100g vs. hot water immersion, Î"58.5 ű 31.2 ml/min/100g; P = 0.02). These data suggest that acute heat exposure improves endothelial-dependent and endothelial-independent microvasculature function in skeletal muscle of aged humans. Furthermore, these data highlight the therapeutic potential of heat therapy to attenuate the hypoperfusion of skeletal muscle that occurs in aged adults during conditions that require an elevated blood supply such as exercise.

Oxidative Stress and Release of Cell-free Mitochondrial DNA from Trophoblast Cells

Abstract ID: UNTHSC51

Research Area: Pediatrics & Women's Health

Presenter: Jennifer J. Gardner

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: GSBS Student

Author(s):

- Jennifer Gardner
- Spencer Cushen
- Jessica Bradshaw
- Isabelle Garlotte
- Nicole Phillips
- Rebecca Cunningham
- Styliani Goulopoulou

Abstract:

Cell free mitochondrial DNA (mtDNA) is an indicator of cellular stress and systemic inflammation. These properties are accentuated when mtDNA undergoes oxidative damage. In addition, toll-like receptor 9 (TLR9), a receptor of the innate immune system, is activated by mtDNA. Inflammation, oxidative stress, and cell death are characteristics of placental ischemia, a common feature of preeclampsia. Recent work from our lab has shown dysregulation of circulating cell-free mtDNA in pregnancies with preeclampsia and association of this dysregulation with preeclampsia diagnosis. However, mechanisms underlying the release of mtDNA remain unclear. We hypothesized that human trophoblast cells exposed to oxidative stress via antimycin A, an inhibitor of complex III of the electron transport chain, would induce release of mtDNA via cell death-dependent mechanisms, leading to increased TLR9 activation. BeWo cells (ATCCif¢ CCL-98) were treated with increasing concentrations of antimycin A (10, 50, 100, 320 $\text{Å}\mu\text{M}$) and vehicle (ethanol, 0.16% v/v) for 4 hours. Supernatants were collected and snap frozen in liquid nitrogen. Absolute real-time qPCR quantification with TaqManâ, ¢ probes and chemistry was used to quantify cell-free mtDNA (amplification target: MT-ND5 gene) and nuclear DNA (nDNA). Flow cytometry was used to assess the activation of cell death mechanisms in response to oxidative stress. To determine TLR-9-associated immunostimulatory potency of cell culture supernatants, we used an engineered cell line of human embryonic kidney 293 cells
transfected with a human TLR-9 gene (HEK-BlueTM hTLR9). Exposure of trophoblast cells to antimycin A did not induce the release of mtDNA (p>0.05) or nDNA (p>0.05). Similarly, there were no differences in TLR9 activation between groups (p>0.28). Antimycin A (320 ŵM) reduced cell viability (Vehicle: $64.44 Å \pm 5.46\%$ vs Antimycin A: $18.14 Å \pm 5.78\%$, p< 0.05) and increased necrosis (Vehicle: $10.39 Å \pm 3.11\%$ vs Antimycin A (100, 320 ŵM): $30.51 Å \pm 4.43\%$, $40.16 Å \pm 5.08\%$, P< 0.05), while apoptosis levels remained unchanged (P>0.1). Activation of oxidative stress pathways, via inhibition of complex III of the electron transport chain, leads to cell death, but does not affect release of mtDNA. These data suggest other cellular mechanisms, such as mitophagy or activation of antioxidant pathways, may serve a cytoprotective role against oxidative stressors in trophoblast cells. This study extends our pre-clinical knowledge about the links between placental oxidative stress and immunogenic factors in trophoblast cells. These findings may contribute to development of novel therapeutic targets for treatment of maternal cardiovascular dysfunction in preeclampsia.

Musculoskeletal Differences Between Amputated and Non-Amputated Lower Limbs

Abstract ID: UNTHSC45

Research Area: Structural Anatomy

Presenter: Graci Finco

Submission Type: Oral Presentation

Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Malaka Finco
- Cait Finnerty
- Wayne Ngo
- Bethany Holley
- Rachel Menegaz

Abstract:

Purpose: People with lower limb amputations frequently experience greater risks of musculoskeletal injury. Forces active during walking help to develop and maintain the shape, volume, and strength of musculoskeletal tissues. Conversely, altered walking patterns following limb loss may lead to atrophy of muscle and bone tissues. Reductions in joint spaces are indicative of excess stress placed on the limb, which may lead to osteoarthritis. Bone loss in high stress regions like the femoral neck can reduce the bone's ability to resist compressive or rotational movements, making the bone more susceptible to fracture. The aim of this study was to measure musculoskeletal differences between an individual's residual (amputated) limb and intact (nonamputated) limb to identify structures vulnerable to injury. We hypothesized that the residual limb, compared to the intact limb, would show: 1) less muscle mass and more fat as indicators of muscle atrophy, 2) wider hip and knee joint spaces as indicators of osteoarthritis in the intact limb, and 3) decreased femoral neck width as an indicator of fracture risk. Methods: CT scans of 10 males (42-79 years) were obtained from the New Mexico Decedent Image Database. 3D Slicer software was used to measure gross skeletal properties, hip and knee joint dimensions, and cross-sectional muscle and fat tissue areas at the midshaft. A Wilcoxon Signed-Rank test was used to assess the differences between residual and intact limbs. The significance level was set at $\hat{I} \pm \hat{a}$ ‰× 0.10 due to a small sample size. Results: Compared to the intact limb, the residual limb had significantly less muscle tissue area (p=0.010) and a significantly narrower femoral

neck width (p=0.077). No significant differences were found in hip or knee joint spaces between limbs. Conclusions: In agreement with hypotheses 1 and 3, these results suggest residual limbs are at increased risk of muscle atrophy and femoral neck fracture compared to intact limbs. Loading inequalities between the residual and intact limb likely contribute to these results. A better understanding of the structural properties associated with musculoskeletal atrophy could inform targeted therapies to reduce the likelihood of injury in this population. Future studies will assess biomechanical properties, such as moment of inertia, to better understand the residual limb's ability to withstand torsional forces and fracture. Additional data on how musculoskeletal tissues respond to unloading at multiple structural levels can improve clinical interventions for lower limb strength and function in amputees.

Hypoxemia Augments the Local Metabolic Error Signal and Improves Coronary Pressure-Flow Autoregulation

Abstract ID: UNTHSC35

Research Area: Cardiovascular

Presenter: Cooper M. Warne

Submission Type: Oral Presentation

Department: GSBS: Physiology & Anatomy

Classification: GSBS Student

Author(s):

- Cooper Warne
- Sal Essajee
- Gregory Dick
- Johnathan Tune

Abstract:

The local metabolic hypothesis proposes that myocardial oxygen tension, indexed by coronary venous PO2 (CvPO2), determines the degree of coronary pressure-flow autoregulation by increasing the production of vasodilator metabolites as coronary perfusion pressure (CPP) is reduced. We tested this hypothesis by examining the extent to which exaggeration of the metabolic error signal influences coronary autoregulatory capability. Experiments were performed in anesthetized, open chest swine (n = 8) in which the left anterior descending coronary artery was cannulated and connected to a servo-controlled roller pump system. This allowed CPP to be reduced from 140 to 40 mmHg in increments of 10 mmHg before and during hypoxemia (PaO2 from 138 \hat{A} ± 5 to 34 $\hat{A} \pm 1$ mmHq). Under control-normoxic conditions, CvPO2 decreased from 33 $\hat{A} \pm 1$ to 20 $\hat{A} \pm 1$ mmHg and coronary blood flow fell from 0.81 $\hat{A} \pm 0.09$ to 0.35 $\hat{A} \pm 0.04$ ml/min/g as CPP was reduced from 140 to 40 mmHg. Hypoxemia augmented myocardial oxygen consumption (P < 0.01), increased coronary blood flow (P < 0.01) 0.0001), and reduced CvPO2 (22 $\hat{A} \pm 1$ to 14 $\hat{A} \pm 1$ mmHg; P < 0.0001) over the same range of CPPs. Increases in coronary blood flow during hypoxemia were sufficient to maintain myocardial oxygen delivery at values equivalent to normoxic conditions (P = 0.20). Calculation of closed-loop autoregulatory gain (Gc) over a CPP range of 120 to 60 mmHg (value of 1 represents perfect autoregulation) demonstrated that Gc was improved from 0.18 \hat{A} ± 0.05 to 0.45 \hat{A} ± 0.14 under normoxic vs. hypoxemic conditions respectively (P = 0.02). Gc was also inversely related to CvPO2 and the slope increased ~4-fold by hypoxemia. These findings support that coronary pressure-flow

autoregulatory capability is augmented by hypoxemia-induced increases in the local metabolic error signal.

Low-dose methotrexate exposure induced long-term cognitive deficits in mice

Abstract ID: UNTHSC27

Research Area: Neuroscience

Presenter: Oanh Trinh

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: GSBS Student

Author(s):

- Oanh Trinh
- Nathalie Sumien
- Philip Vann
- Delaney Davis
- Robert Luedtke
- Riyaz Basha
- Meharvan Singh

Abstract:

Purpose: Chemotherapy-related cognitive impairment (CRCI) remains a mysterious morbidity that threatens the quality of life of up to 70% cancer survivors in the United States. Longitudinal studies of CRCI highlighted deficits in memory, learning, attention, motor, and executive functions for up to 20 years after the completion of chemotherapy paradigm. These deficits, especially if happened during childhood, can negatively impact educational achievement, employment, self-independence, and life expectancy of approximately 500,000 adult survivors currently living in the U.S. Given that acute lymphoblastic leukemia (ALL) is the most common diagnosis of childhood cancers worldwide, the folate-inhibitor methotrexate (MTX) has been at the backbone of ALLtreatment with a substantial risk of neurotoxicity. The purpose of this study was to establish a tumor-free mouse model representative of MTX-induced CRCI in childhood ALL survivors and study the long-term effects of chemotherapy treatment on brain function. We hypothesized that MTX administration at a very young age will induce long-term cognitive impairments. Methods: At post-natal day 15, male and female C57BL6/J pups received intraperitoneal injections of either saline (n=12) or MTX (2 mq/kg; n=12) once a day for 3 days. The pups were weaned at post-natal day 21 and allowed to age. At 8-month-old, animals underwent behavioral tests to assess motor, affective and cognitive functions. Results: MTX administration impaired cognitive flexibility in males and impaired spatial learning and memory in females, indicating

potential sex- and test-dependent behavioral outcomes. MTX increased performance in coordinated-running test, and increased swimming speed. Anxiety-like behaviors were not affected by the treatment. Conclusions: These preliminary results suggested that low dose MTX-treatment induced sex-dependent cognitive deficits while affective and motor functions were not negatively affected. This study will be repeated, and behaviors will be assessed at other time points to establish complete neurobehavioral profiles of mice affected by MTX chemotherapy.

Mechanisms of peptain-mediated neuroprotection in retinal ganglion cells

Abstract ID: UNTHSC23

Research Area: Eye / Vision

Presenter: Gretchen A. Johnson

Submission Type: Oral Presentation

Department: North Texas Eye Research Institute

Classification: GSBS Student

Author(s):

- Gretchen Johnson
- Jennifer Pham
- Bindu Kodati
- Raghu Krishnamoorthy
- Ram Nagaraj
- Dorota Stankowska

Abstract:

PURPOSE: To determine mechanisms underlying neuroprotective effects of the core peptide of alpha-B crystallin, peptain-1 (P1) conjugated to a cell-permeable peptide CPP (P1-CPP) in retinal ganglion cells (RGCs) in a rodent model of glaucoma. METHODS: Intraocular pressure (IOP) was elevated in Brown Norway (BN) rats and intravitreally injected with 2 $\hat{A}\mu$ of either P1-CPP or vehicle, once a week for a period of 2 weeks. Rats were euthanized, primary adult RGCs were isolated by the immunopanning method. Total RNA was isolated using the Trizol/column method. RNA-sequencing was performed using an Illumina platform. The resulting FASTQ files were uploaded into Galaxy for analysis with FASTQC, RNASTAR, feature counts, and finally DESeq2. The results from DESeq2 were then assessed with Qiagen's Ingenuity Pathway Analysis (IPA) to identify significantly upregulated pathways. Relative Creb-1 expression normalized to reference gene GAPDH was determined in IOP-P1-CPP and IOP-vehicle treated rat RGCs. Briefly, quantitative Polymerase Chain Reaction (qPCR) was performed using BioRad's PrimePCR Assay and SsoAdvanced Universal SYBR Green Supermix on the BioRad's CFX96 Real-Time System C1000 Touch Thermal Cycler. RESULTS: RNA-seq analysis from rat RGCs isolated following 2 weeks of IOP-elevation revealed that P1-CPP treated groups had several differentially expressed (DEGs), compared to vehicle-treated groups, including 6343 significantly upregulated and 5960 significantly downregulated. Some significantly upregulated pathways following P1-CPP

treatment include phagosome formation, synaptic long-term depression, and CREB signaling in neurons. The IOP and vehicle-treated groups, when compared to the naà ve group, demonstrated a decreased expression of members of the CREB signaling pathway (Creb-1, c-RAF, MEK1/2, ERK1/2, and p90RSK). This decline was prevented by P1-CPP treatment. Quantitative PCR further confirmed the RNA-seq findings of the increased expression of Creb-1 in P1-CPP treated rats compared to that of vehicle-treated group. CONCLUSIONS: Mechanism of action of P1-CPP in a rodent model of glaucoma includes the activation of the pro-survival CREB signaling pathway, phagosome formation, and long-term synaptic depression to prevent cell death and vision loss.

Characterizing Region-Specific Glucose Metabolic Profile of the Rodent Brain Using Seahorse XFe96 Analyzer

Abstract ID: UNTHSC22

Research Area: Neuroscience

Presenter: Linshu Wang

Submission Type: Oral Presentation

Department: GSBS: Pharmacology & Neuroscience

Classification: GSBS Student

Author(s):

- Linshu Wang
- Kiran Chaudhari
- Ali Winters
- Yuanhong Sun
- Ran Liu
- Shaohua Yang

Abstract:

Purpose: The brain is highly complex with diverse structural characteristics in accordance with specific functions. Accordingly, differences in regional function, cellular compositions, and active metabolic pathways may link to differences in glucose metabolism at different brain regions. A recent study using imaging mass spectrometry demonstrated that some of the glucose metabolism enzymes and ATP level vary dramatically cross the brain. Disruption of glucose metabolism forms the pathophysiological basis for many brain disorders. Therefore, the brain spatial metabolic signatures are of high relevance in our understanding of the normal brain physiology and neuropathology of neurological diseases. Method: We optimized an acute biopsy punching method and characterized region-specific glucose metabolism of rat and mouse brain by a Seahorse XFe96 analyzer. Results: In the current study, we demonstrated that 0.5 mm diameter tissue punches from 180-µm thick brain sections allow metabolic measurements of anatomically defined brain structures using Seahorse XFe96 analyzer. We found that the cerebellum displays a more quiescent phenotype of glucose metabolism than cerebral cortex, basal ganglia, and hippocampus. In addition, the cerebellum has higher AMPK activation than other brain regions evidenced by the expression of pAMPK, upstream pLKB1, and downstream pACC. Furthermore, rodent brain has relatively low mitochondrial oxidative phosphorylation efficiency with up to 30% of respiration linked to proton leak. Conclusions: The present study determined

the region-specific glucose metabolic profile of rodent brain using acute biopsy punches and Seahorse XFe96 analyzer. The metabolic flux analysis indicated that the cerebellum has a more quiescent phenotype of glucose metabolism as compared with the cerebrum. In addition, glucose metabolism might be less efficient in the brain than we expected, with relatively large component of proton leak-linked respiration. COMPETITION POSTERS

Studying the Interplay Between Baseline Mental Health and Alzheimer's Disease Progression

Abstract ID: UNTHSC376 Research Area: Aging / Alzheimer Presenter: Sumedha Rao Submission Type: Competition Poster Department: Institute for Healthy Aging Classification: TCOM DO Student (2nd Year)

Author(s):

- Sumedha Rao
- Mohammad Housini
- Donald Royall
- Raymond Palmer
- Robert Barber

Abstract:

Background: In aging adults, the most common form of dementia is Alzheimer's disease (AD). AD pathogenesis involves the accumulation of beta-amyloid (AÃŽÂ²) protein aggregation in plagues and tau proteins in neurofibrillary tangles that are associated with a decreased number of synapses in the brain, altered neuronal function and cell death via neurotoxicity, as well as learning and memory deficits. Clinically, the presence and severity of neuropsychiatric symptoms that AD patients present with can be reliably measured by the Neuropsychiatric Inventory Questionnaire (NPIQ). This study aims to explore the association between baseline mental health and the severity of AD progression. Methods: To measure baseline mental health, NPIQ scores were used while the change in DeltaEq was used to represent the severity of AD progression within the TARCC cohort. DeltaEq is a homolog of Delta, a reliable latent dementia proxy that represents cognitive correlates of functional status and is specific for distinguishing cases with AD from other dementiarelated presentations. Most crucially, the DeltaEq homolog has been adjusted for equivalence across ethnicities. Using stratified analysis and structured equation models, the association between baseline mental health and change in was investigated. Results: The first model exploring NPIQ and the change in DeltaEq was only adjusted for baseline $\tilde{A}^{-}\tilde{A}\Box\tilde{A}^{x}$ eq; it showed NPIQ explaining 19% of the variance in delta DeltaEq and was statistically significant at p=0.016 for Non-Hispanic Whites. With the second model, age, sex, and education were adjusted for in addition to baseline $\tilde{A}^{-}A \Box A^{-}x$ eq. NPIQ was shown to explain 25% of the variance in delta DeltaEq while being statistically significant at p=0.037for Non-Hispanic Whites. This model was replicated in the Alzheimer's Disease Neuroimaging Initiative (ADNI) cohort; NPIQ was shown to be predictive for delta DeltaEq at p=0.013. Conclusion: In Non-Hispanic Whites, worse baseline mental health has been shown to predict increased severity and progression of AD. This makes it a clinical

therapeutic target with the possible benefit of impacting the course of AD in patients. The fascinating interplay between mental health and its relationship to Alzheimer's disease should be studied further with an additional focus on ethnicity.

The Incidence of Arterial Injury on CT Imaging in Cervical and Skull Base Fractures

Abstract ID: UNTHSC373 Research Area: Other Presenter: Caren Stuebe Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCU/UNTHSC School of Medicine

Author(s):

- Nadeem Al-Adli
- Caren Stuebe
- Michael Oh

Abstract:

Introduction: Blunt trauma to the head and cervical spine can result in vascular injury, particularly to the carotid and vertebral arteries. Computed tomography (CT) angiography is replacing conventional cerebrovascular angiography in the screening of trauma patients with suspected arterial injury. We were interested in investigating the incidence of CT-identified vascular injuries in skull base and/or cervical fracture patients. Methods: To assess the incidence of CT-identified arterial injury, a retrospective review was conducted of traumatic cervical and skull base fracture patients at a level I trauma center from January 2015 to September 2021. Results: 726 total patients were identified. 50 patients were excluded for insufficient imaging data. 17 patients (6 with skull base fractures, 10 with cervical fractures, and 1 with both cervical and skull base fractures) received a non-CT imaging modality and were excluded. None had arterial injuries. 659 total patients received CT imaging, 422 with CT-imaged cervical fractures, 213 with CT-imaged skull base fractures, and 24 with CTimaged cervical and skull base fractures. Of the 422 CT-imaged cervical fractures, 2 had carotid artery injuries, 20 had vertebral artery injuries, and 4 had both carotid artery and vertebral artery injuries. Of the 213 CT-imaged skull base fractures, 2 had carotid artery injuries and 2 had vertebral artery injuries. One of the 24 CT-imaged patients with both cervical and skull base fractures had vertebral artery injury. Conclusion: The incidence of CT-identified arterial injury was 6.16% in cervical fracture patients, 1.88% in skull base fracture patients, and 4.17% in patients with both cervical and skull base fractures. While CT-identified arterial injuries were noted, the incidence was low overall, although it appears higher in the setting of cervical, as compared to skull base, fractures. Future studies will assess the characteristics, screening, and outcomes of cervical and skull base fracture patients with arterial injuries.

Pilot Testing a Web-Based Mobile App Designed to Increase Communication and Care Coordination Among Patients, Physicians and Pharmacists

Abstract ID: UNTHSC371 Research Area: Health Disparities Presenter: Rachel Clark Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Rachel Clark
- Annesha White
- Jin Liu
- Tram Vo

Abstract:

OBJECTIVES- The fragmented healthcare system in the United States results in failures of care coordination estimated to cost the healthcare system between \$27.2 billion to \$78.2 billion. Improving communication between providers, pharmacists, and patients is an area with potential to reduce medication errors. Current fax and phone-based communication between pharmacists and physicians is insufficient to address patient concerns. The objective of this pilot project was to test the feasibility and categorize the desired features of a mHealth web-based platform. METHODS- Market research was conducted to identify the available mobile applications focused on patient engagement with physicians and pharmacists. Once the functional web-based application was developed, feasibility and desirability was tested by the assessment of feedback received from early users (patients, physicians and pharmacists). After contact was established and eligibility confirmed, participants were interviewed to collect baseline information about facilitators and barriers in their process of communication. Once the interviews were complete, responses were content analyzed. RESULTS- A total of 10 patients, 9 pharmacists, and 12 physicians (N=31) provided positive feedback on the feasibility and desirable features of the app as evidenced by high rates of interest (all respondents shared that they would use the app if available) and low participant burden. Feedback on desirability was categorized as features that include: (1) Telemedicine/communication, (2) E-prescriptions, (3) Prescription discounts, and (4) Patient EHR portals. Based on the stakeholder interviews, there was interest in integrating a platform spanning across health systems to promote more efficient communication and reduce the barriers to patient-initiated collaboration between physicians and pharmacists. CONCLUSION- There is a need to consolidate health information to improve healthcare outcomes. A web-based communication platform would serve to reduce medical errors caused by a lack of care coordination between physicians, pharmacists, and

patients. The application will empower patients and include pharmacists in digital collaboration for patient care.

Educating Rural Communities About Advance Directives

Abstract ID: UNTHSC370 Research Area: Community Medicine Presenter: Arkoon Ali Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Arkoon Ali
- Alyssa Molina
- Lesca Hadley

Abstract:

Introduction: Advance directives are legal documents that allow patients to convey end-oflife care to their family, medical community, and other important people in their lives. However, a meta-analysis of 150 studies found that only 36.7 percent of the 795,909 sample population had advance directives completed. Limited healthcare resources and low levels of health literacy in rural communities can create challenging medical situations that can be abated by advance directives. Thus, it is imperative to find unique ways to educate and increase the number of advance directives within rural communities. Methods: A presentation and question-and-answer session about advance directives was conducted for adult residents of Eagle Lake, Texas. This occurred in public spaces such community centers and local places of worship. Afterwards, a survey was administered to assess the likelihood of patients creating advance directives. Results: There were 29 participants in the study of which 17 did not have advance directives. Of the 17, 10 were moderately considering or higher to create advance directives prior to the presentation and question-and-answer session. After the enhancement activity, 12 of the 17 were moderately considering or higher to create advance directives. Conclusion: Due to the small population size of the study, the effectiveness of community education on likelihood of completion of advance directives cannot be made. Expanding the population size should be considered in a future study to determine statistical significance. Furthermore, from conversations with participants in the study, several said they would update their existing advance directives due to the presentation. In the future, data should be collected about revaluations of prior written advance directives to have a more complete understanding of the impact of the intervention. From the data gathered, there is a significant percentage of participants that were considering making advance directives but had not done so. A study should be conducted to determine what is limiting rural populations from completing their advance directives.

Multimodal Treatment of Sarcomas Linked to BCOR-CCNB3 Fusion in Pediatrics: A 3-Patient Case Series

Abstract ID: UNTHSC367 Research Area: Cancer Presenter: Salma Omar Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Salma Omar
- Karen Albritton
- Kenneth Heym
- Jason Wang
- Anish Ray

Abstract:

Background: Molecular genetic testing in cancer diagnosis has resulted in subclassifications of malignancies previously grouped together. In 2012, a new entity was classified according to fusion of the B-cell lymphoma (BCL-6) co-repressor (BCOR) gene and the testis-specific cyclin B3 (CCNB3) gene on the X-chromosome, known as a BCOR-CCNB3 fusion positive sarcoma. Previous studies have focused on clinical and pathologic characterization of this specific malignancy, but standard treatment modalities are not well documented. Objectives: Given their relatively new classification, the treatment approach has remained variable. We describe three pediatric patients with BCOR-CCNB3 fusion positive sarcomas. In summarizing treatments and outcomes, we aim to add to the body of knowledge for this subtype. Design/Method: This was a retrospective study of three de-identified patient charts. BCOR-CCNB3 fusions were confirmed in all three patients using fluorescence in-situ hybridization (FISH). Results: Case 1 "" A 2-year-old Black female presented with a firm, right calcaneal mass measuring 5.6 x 3.7 x 3.1 cm. Following diagnosis of BCOR-CCNB3 fusion sarcoma, she was promptly started on an interval compressed regimen of alternating vincristine-doxorubicin-cyclophosphamide and ifosfamide-etoposide with local control accomplished through amputation of the right foot. She has been in remission for two years. Case 2 "" A 12-year-old Caucasian female presented with a two-week history of unilateral right hip pain that worsened with activity. Imaging revealed a 8.2 x 6.0 x 8.3 cm mass on the right pubic bone. She began treatment with 6-cycles of ifosfamide and doxorubicin. For local control, the patient underwent radical resection of the right pubic bone. She remains free of disease and fully active 2.5 years following completion of therapy. Case 3 "" A 16year-old Black male presented with right lateral ankle pain and swelling and was unable to bear weight. MRI revealed a soft tissue mass, measuring $6.0 \times 4.0 \times 6.6$ cm. The mass was grossly excised with positive margins. Therapy consisted of compressed alternating cycles of interval vincristine-doxorubicin-cyclophosphamide and ifosfamide-etoposide with daily proton beam therapy starting cycle 7. The patient remains in remission at his last visit 2 years from completion of therapy. Conclusion: We notice Cases 1 and 3 were treated using 5-drug Ewing sarcoma treatment protocol while Case 2 received two drug therapy using combination of ifosfamide and doxorubicin. The variation in treatment regimens highlight existing lack of consensus and we hope that a multi-institutional trial will help solidify future course.

Effects of Osteogenesis Imperfecta on Dental Tissue Volumes in Mice

Abstract ID: UNTHSC366 Research Area: Structural Anatomy Presenter: Jacob Moore Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Jacob Moore
- Emma Handler
- Rachel Menegaz
- Lauren Gonzales
- Jason Organ

Abstract:

Osteogenesis imperfecta (OI), commonly known as brittle bone disease, is associated with lifelong dental problems, including increased dental fractures, discolored teeth, and malocclusion. OI is a disorder of the type I collagen protein. Insufficient amounts or misshapen forms of this protein lead to disruptions in the microstructure of bone and teeth tissues. Dentin, the hard tissue which comprises the bulk of the tooth and absorbs shock forces during chewing, develops on a type I collagen matrix. Thus, collagen abnormalities in OI lead to disorganized and less stable dentin. Further, teeth in people with OI frequently exhibit dentin hypertrophy, where increased amounts of dentin are deposited at the interior of the tooth, shortly after dental eruption. Enamel, unlike dentin, develops on a matrix of non-collagenous proteins, and is thought to develop normally in OI. However, abnormalities in the underlying dentin in OI can lead to enamel fractures. Finally, the teeth in people with OI have often been noted to be smaller than those of people without OI. Because dental development occurs early in life, there is a lack of data surrounding the developmental processes and associated issues in dental development of children with OI. Mice are commonly used models for dental development, yet, this process has not yet been studied in mice. The objective of this study is to compare dental tissue volumes of teeth from mice with OI (oim) and wild type mice (wt) at different developmental stages to determine the degree of volume and gross dental size differences during late growth stages. Threedimensional models of upper and lower first molars and incisors were created from microCT scans from oim and wt mice. Scans were taken at weaning age (four weeks after birth; "ceW4") and young adulthood (sixteen weeks after birth; "ceW16"). Dental tissue volumes were measured using 3D Slicer and normalized to mandibular centroid size. Mann-Whitney U tests were used to compare tissue volumes between genotypes and age groups. At W4 and W16, oim mice had significantly lower dentin volumes and total tooth volumes

for upper incisors than wt mice (p < 0.05), with no significant difference between groups for other tooth types at either timepoint. At W16, total tooth volume was significantly lower in oim mice for molars before adjusting for mandible size (p < 0.05). For both oim and wt groups, W16 mice had significantly greater dentin, enamel, and total tissue volumes for lower and upper incisors compared to W4 mice (p < 0.05), as well as greater dentin volumes for lower molars (p < 0.05). These results demonstrate that the trend of smaller teeth in humans with OI also holds for the oim mouse. These differences are present at both the juvenile and young adult life stages. This affirms the oim mouse as a possible model for dental development in humans with OI. Further studies are needed to determine the developmental program of these volume differences at earlier growth stages.

3D TUMOR MODELING TO IMPROVE BIOMARKER IDENTIFICATION AND CANCER OUTCOMES.

Abstract ID: UNTHSC363 Research Area: Cancer Presenter: Preteesh Leo Mylabathula Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Postdoctoral Fellow

Author(s):

- Preteesh Mylabathula
- Payal Ranade
- Rucha Trivedi
- Jamboor Vishwanatha

Abstract:

Purpose: Cancer-associated proteins annexina2 (ANXA2) and MIEN1 are overexpressed in various cancers including triple negative breast cancer, prostate, and colorectal cancers. Therefore, these proteins are being investigated as potential biomarkers and therapeutic targets. We will use a 3D tumor model to mimic in vivo tumor growth and evaluate changes in tumor characteristics after silencing ANXA2 and MIEN1 to understand their correlative/causal relation to tumor behavior. Methods: Ultra-low attachment 3D culture plates were used to culture tumor spheroids in breast cancer cells(MDA-MD-231) with ANXA2 knock-down using sh-RNA and colorectal cancer cells(HT29) with MIEN1 knock-out (KO) using CRISPR-Cas9. Changes in spheroid growth, migration and invasion, drug sensitivity, and immune cell killing will be evaluated. Boyden chambers with Matrigel inserts were used to evaluate migration and invasion. Spheroids were imaged using confocal microscopy for size estimation. Results: Optimal initial seeding density was 5000 cells and spheroids were grown for 7-days. Average tumor spheroid size was 1360ű420ŵm with no differences in spheroid size with MIEN1 KO. 50% reduction in migration and invasion potential were observed after MIEN1 KO in colorectal cancer cells in a 96-hour time-course experiment. Experiments with ANXA2 knock-down are ongoing with spheroid sizes averaging 1700ű260ŵm. Future experiments include evaluating changes in protein expression, drug sensitivity, immune cell killing as a result of knockout of MIEN1. Conclusion: We expect the results to identify functional role of cancer-associated proteins ANXA2 and MIEN1 in tumor spheroid growth, metastasis, drug sensitivity, and susceptibility to immune cell killing. Funding: Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health under Award Number R01CA220273 (JKV).

Title: In-vitro Two Step Dissolution Study of Docetaxel Granules in Fed Media

Abstract ID: UNTHSC359 Research Area: Pharmacology Presenter: Chaitanya Kasim Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: TCOM DO Student (2nd Year)

Author(s):

Chaitanya Kasim

Abstract:

Presenter: Chaitanya Kasim Authors: Chaitanya Kasim, OMS-II, Dr. Brijesh Shah, Ph.D, Dr. Xiaowei Dong, Ph.D Title: In-vitro Two Step Dissolution Study of Docetaxel Granules in Fed Media Background: Lung cancer is the leading cause of death in America amongst all cancer related deaths. The conventional treatment for lung cancer is with Docetaxel (DTX), which works by inhibiting microtubule formation and has shown to significantly slow lung cancer progression. Typical administration of DTX is based on administering high doses of chemotherapeutic drugs at low frequency; however, this treatment method yields a poor 5year survival outcome. Specifically, DTX is administered intravenously (IV) due to its low oral bioavailability. IV administration, however, is taxing on the patient, so better therapy modalities are needed. Recent studies suggest that metronomic therapy, administering low doses of a drug at high frequency, may lead to better survival outcomes. Our lab explored in situ self-assembling nanoparticle (ISNP) granule composed of lipids and surfactant as a potential method of drug delivery for metronomic therapy. The aim of this study is to determine the optimal Lipid: Surfactant ratio and composition for high DTX drug release. Hypothesis: We hypothesize that the ISNP granule composed of 1:1 lipid: surfactant ratio will lead to the highest drug release. Methods: Previous studies have shown that ISNP granules were able to deliver significant drug concentration to lung tissue in vivo but failed to demonstrate these results in vitro. To reflect this discrepancy between in vivo and in vitro studies, our lab developed new protocols that correlated with physiological pH changes during digestion known as "œFed Media"□. Our lab formulated DTX ISNP granule composed of different ratios of lipid-Miglyol 812 (M) and surfactant- TPGS (T) and added to Fed Media. Samples were taken at different timepoints and drug release was measured via HPLC. We then formulated granules composed of different lipids (Cap200 and PG8 backbone) and measured its drug release. Results: The M:T 1:1 formulation led to the highest drug release. As expected, the blank granules led to a lower or similar release when compared to pure DTX powder. However, there was an interesting result, the DTX release for M:T ratio 0:1 is close to M:T 1:1. This was surprising as it showed that surfactants played an important role when prior emphasis was placed on lipids. For different lipid compositions, Cap200 is

showing a higher drug release compared to PG8 backbone. Conclusion: The results validate the hypothesis that 1:1 M:T ratio will lead to the highest drug release. However, the 0:1 M:T ratio provides interesting avenues for research. The role of surfactants in improving DTX solubility needs to be explored further. One theory is that the granule formulation process might by playing a role in improving solubility. Future directions for this study include exploring different diester lipid backbones and see how it effects drug release.

Sacroiliac Joint Fusion Using the iFuse Titanium Triangular Implant System: Longitudinal Outcomes Study

Abstract ID: UNTHSC358 Research Area: Other Presenter: Nadeem Al-Adli Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Nadeem Al-Adli
- Alexandra Richards
- Gregory Smith

Abstract:

Introduction: Sacroiliac (SI) joint dysfunction causes severe, debilitating lower back pain that often interferes with activities of daily living. It is considered a significant contributor to low back pain in the general population and is amenable to treatment with minimally invasive techniques. This study aimed to characterize the patients who underwent elective SI joint fusion and evaluate the associated long-term outcomes. Methods: From October 2012 to October 2019, 230 eligible cases were identified. Demographic and medical history was collected retrospectively via chart review, while patient-reported measures were collected prospectively via electronic survey. The Oswestry Disability Index (ODI), 5-level EuroQol-5D (EQ-5DL), visual analog scale (VAS) for health, and Likert scales for satisfaction and repeat likelihood were utilized to evaluate long-term outcomes. Patient-reported medications were utilized to calculate opioid oral morphine milligram equivalents (OMME). Results: Twenty-nine patients (M=9; F=20) with a mean age of 61.07 years (SD 12.23, range 31-79) and outcome data, on average, 5.06 years (1.91, 2.66 "" 8.38) from surgery were included. Prior to surgery, 12% of patients had pain for less than 1 year, 35% for 1-2 years, 15% for 2-3 years, 19% for 3-5 years, and 19% for more than 5 years. 50% of patients were very satisfied with their surgery, 27% were satisfied, 15% were neutral, only 8% were dissatisfied, and no patients were very dissatisfied. Overall, 38% of patients were very likely to repeat the surgery for the same diagnosis, while only 19% were very unlikely to do so. Mean total ODI score was 16.52 (10.65, 0-72), EQ-5DL mobility was 2.21 (1.14, 1-5), EQ-5DL self-care was 1.42 (0.65, 1-3), EQ-5DL usual activities was 2.38 (1.13, 1-5), EQ-5DL pain discomfort was 2.50 (1.10, 1-4), EQ-5DL anxiety and depression was 2.00 (1.10, 1-5), and VAS health score was 65.08 (17.97, 29-90). ODI total percentage was strongly correlated with VAS health scores (r = -0.6059, p=0.0017). The mean OMME was 5.65 (13.25, 0-50), which was correlated with ODI pain intensity (r=0.2159, p=0.0065), ODI total percentage (r=0.4478, p=0.0248), and VAS health scores (r=-0.4920, p=0.0148). Lastly, pre-operative duration of pain was not significantly associated with ODI

scores or VAS health scores. Conclusion: Our data suggest that patients who electively undergo SI joint fusion using the iFuse implant system are mostly satisfied with the operation and likely to repeat it for the same diagnosis. Furthermore, the operation is associated with long-term benefits demonstrated by the mean time since surgery for the entire cohort and their associated ODI, VAS health, and EQ-5DL scores. Lastly, preoperative pain duration did not significantly affect the patient-reported outcomes, indicating that patients can expect positive outcomes, regardless of the chronicity of their pain prior to the operation. Future studies should focus on predictive factors of these longitudinal measures of patient quality of life, disability, pain features, and return to activity following SI joint fusion.

Pharmacist's Role in Interdisciplinary Clinic Model for Patient-Centered Care of Chronic Pediatric Asthma

Abstract ID: UNTHSC357 Research Area: Community Medicine Presenter: Kimberly Tran Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

• Kimberly Tran

Abstract:

Asthma is a chronic inflammatory disease of the airways affecting millions of adults and children worldwide that typically presents with wheezing, dyspnea, chest tightness, cough, and sputum. Pharmacists play a critical role in the management of asthma through patient education, medication training, and medication adjustment. The UNTHSC Health Pediatrics Asthma Clinic Protocol team, using a collaborative interdisciplinary model, consisted of a medical assistant, medical student/resident physician/attending physician, and pharmacy student/pharmacy resident/clinic pharmacist. The workflow diagram was modified for COVID-19 with virtual visits for management, allowing for less time constraints and higher volume and provider availability for patients. A hybrid patient-centered asthma clinic can be proposed to merge both models to streamline accessibility to care and facilitate provider-patient partnering.

Virtual reconstruction of 3D skeletal anatomy: A comparison of two methodologies

Abstract ID: UNTHSC356 Research Area: Structural Anatomy Presenter: Amanda Warner Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

- Amanda Warner
- Scott Maddux
- Alexa Kelly

Abstract:

Due to destructive taphonomic processes, human skeletal remains recovered from forensic and archaeological investigations commonly exhibit varying amounts of damage and fragmentation. This damage inherently presents obstacles for subsequent analyses via 3D morphometric techniques, as such methods typically require that all specimens possess homologous anatomy (i.e., no missing data). As a consequence, the use of 3D modeling software for digitally reconstructing damaged skeletal remains has become increasingly important across forensic anthropology, bioarchaeology, and paleoanthropology. To date, two competing methods are generally employed for reconstruction purposes: mathematical prediction of missing data using a reference sample (i.e., "œmean substitution") and virtual reconstruction in which missing data on one side is predicted by reflecting existing data from the contralateral side (i.e., " ∞ mirror imaging" \Box). Given that the mean substitution method requires the availability of an appropriate reference sample, mirror imaging approaches are widely preferred by most researchers even though they are usually more time consuming and computationally intensive. However, the actual accuracy and comparability of mean substitution and mirror imaging has not been thoroughly investigated. Here, we compare mean substitution and a new mirror imaging method we have developed for reconstructing human cranial remains. Our newly developed method permits missing data to be reconstructed using mirror imaging while incorporating data from any intact/undamaged anatomy available on the side under reconstruction. To test the accuracy and comparability of the two reconstruction methods, we employed a fully intact cranium and used the two methods to digitally reconstruct the left side of the face (as if it was damaged). Bilateral measurements of facial width (i.e., spanning the right and left side of the face) derived from the two reconstruction methods were then compared to the specimen's actual measurements. Results indicate that the mirror imaging approach accurately reconstructs missing data to within 0.3-2.6 mm of the specimen's actual anatomy. Importantly, measurement error for this 3D virtual reconstruction technique

appears to be randomly distributed, indicating this method does not systematically over- or under-estimate the positioning of reconstructed data. In contrast, the mean substitution approach was found to reconstruct missing data points to between 4.1-8.0 mm of their actual correct anatomical position. Measurement error for this method was found to routinely overestimate the mediolateral positioning of reconstructed data, indicating that this method typically reconstructs facial structures slightly wider than is anatomical accurate. These results suggest that the mirror imaging method permits more accurate reconstruction of missing data compared the mean substitution approach. Moreover, the mean substitution approach remains dependent on the predictive accuracy of the employed reference sample, the appropriateness of which may be difficult to identify for specimens of unknown ancestry and/or sex. Accordingly, the mirror imaging methodology developed for this study appears advantageous in most investigative scenarios. Additional evaluation of this newly developed 3D reconstruction method in comparison to other virtual reconstruction protocols is thus warranted.

A Drug-Loaded Nanoparticle to Target Bone-Metastatic Prostate Cancer

Abstract ID: UNTHSC353 Research Area: Cancer Presenter: Jana B. Lampe Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Jana Lampe
- Priyanka Desai
- Amit Kumar Tripathi
- Amalendu Ranjan
- Jamboor Vishwanatha

Abstract:

Treatment for localized prostate cancer (PCa) has a tremendous success rate. However, the fact that the five-year overall survival rate drops from 100% to 30.2% when tumor cells metastasize to distant sites, represents an unmet medical need. In 90% of metastatic cases, bone is the primary metastatic site. Our objective is to co-load a poly(lactic-coglycolic) (PLGA) nanoparticle (NP) with Cabazitaxel (CBZ) and Bortezomib (BTZ) and to conjugate a bone-targeting moiety, Alendronate (ALN), to the outside of the nanoparticle to facilitate targeting to bone tumors and to ameliorate the resulting bone damage. We hypothesize that this targeted nanomedicine will affect genes and proteins that contribute to invasion and migration, anti-apoptotic signaling, and ultimately lead to tumor-cell apoptosis. Furthermore, we predict that the nano-delivery system will help ameliorate bone lesions inflicted by the tumors. Methods: Nanoparticles were engineered using an Emulsion-Diffusion-Evaporation Technique in which PLGA is dissolved in dichloromethane, 5% polyvinyl alcohol, and Bis(sulfosuccinimydyl)suberate (BS3) crosslinker. For targeting, Alendronate (ALN) is later conjugated to the outside of the nanoparticle via this crosslinker. Results: Our average NP size was around 240 nm in diameter, a PDI of < 0.2, with a Zeta Potential (ZP) of -28 mV. Our drug loading capacity (DL) for CBZ was 11.97% and for BTZ 0.9%. Encapsulation efficiency (EE) for CBZ was 25.26% and 8.9% for BTZ. The IC50 for the CBZ NPs is 5.6 nM and BTZ NPs is 15.6 nM. We have successfully shown that the gene expression for various migration and invasion markers as well as cell signaling proteins have been affected by the nanoparticles. Conclusions: Our nanoparticles have a desirable size, PDI, ZP, DL, and EE for our intended therapeutic purpose. Furthermore, we have shown alterations in the cell signaling and gene expression responsible for Epithelial-to-Mesenchymal Transition-Transcription Factors (EMT-TFs), indicating that our

nanotherapeutic has significant potential to treat metastatic PCa and to mitigate the damage done by metastatic tumors.

Disseminated Cryptococcus Neoformans Infection in a Renal Transplant Patient

Abstract ID: UNTHSC352 Research Area: Microbiology / Infectious Disease Presenter: Praharsha Tangirala Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (3rd Year)

Author(s):

- Praharsha Tangirala
- Trina Mathew
- Jack Lee
- Ryan Arispe
- Harika Yalamanchili
- Mohan Sengodan
- Madhrira Machaiah
- Saravanan Balamuthusamy

Abstract:

Background: Cryptoccocus Neoformans is a fungus mainly found in the environment that infects humans via inhalation and usually affects the lungs and central nervous system. Most people remain asymptomatic; however, immunocompromised patients are most susceptible to this pathogen, particularly HIV/AIDs patients. We present a case of a renal transplant patient with disseminated Cryptococcus Neoformans infection. Case Presentation: A 71 y/o female presents to the emergency department for further evaluation of a fever of unknown origin that has been going on for 6 days. Outpatient workup was initiated by the transplant service; however, due to persistently high fevers she was admitted for further workup and management. Patient reports that her fevers mainly occur at night and reach a maximum of 104-105 F. In the morning the fever decreases to 102 F with Tylenol. Denies any other significant symptoms, recent travel, sick contacts, alcohol, tobacco, or drug use. Past history is significant for CKD due to IgA nephropathy with renal transplant 2.5 years ago. Patient is currently on a chronic immunosuppressive regimen of Mycophenolate and Tacrolimus and infection prophylaxis with TMP-SMX and Valganciclovir. Upon admission, vitals were within normal limits and physical exam was unremarkable. Labs showed negative urinalysis, influenza, COVID-19, and rapid strep antigen test. Lactic acid, magnesium, coagulation studies, TSH, and troponin were all within normal limits. BUN was elevated at 32 and Creatinine at 1.8. White blood cell count was decreased at 2.8k, hemoglobin decreased at 10.9, and hematocrit decreased at 34.2. Chest X-ray showed nodular opacifications involving the right mid to upper lung, possibly masses or mass like infiltrates. Malignancy at this point was high on the differential. CT of the chest was then

obtained, which revealed a right upper lobe mass and bilateral pulmonary lymph node involvement that was concerning for metastatic disease. On admission day 2, a CT guided lung biopsy was done. Preliminary reads were suggestive of fungal etiology and no malignancy with the final report of histoplasmosis, but clinical correlation was recommended. On day 5, Cryptococcus Antigen (Ag) titer was obtained and was elevated. On day 6, bronchoscopy with cultures using MALDI-TOF revealed Cryptococcus neoformans and no malignant cells. Given concomitant cytopenia, patient was started on treatment for disseminated Cryptococcal disease with ambisome and flucytosine. However, patient developed an AKI likely from ambisone, and the regimen was switched to PO Voriconazole BID. On day 10, patient was switched to high dose fluconazole. On day 12, repeat Cryptococcal Ag titers showed an increase from 1:40 to 1:320, which was concerning for a high fungal burden. Ambisone was added back on with the fluconazole; however, due to worsening renal function ambisome was held again. Ultimately, the patient wanted to go home and she was discharged on high dose fluconazole per infectious disease recommendation with PCP and transplant service outpatient follow up. Discussion: This case demonstrates that although lobar masses in the elderly can be highly suspicious for malignancy, rarer causes such as Cryptococcus Neoformans should be considered on the differential.

An Intraoperative Diagnosis of Intrathyroid Parathyroid Adenoma in a 34-year-old Hispanic Female: A Case Report

Abstract ID: UNTHSC351 Research Area: Other Presenter: Ren Shirai Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Ren Shirai
- Jeffery Przybyla

Abstract:

Background: Up to 85% of primary hyperparathyroidism is caused by a single parathyroid adenoma, which most commonly occurs in the external aspect of the inferior pole of the thyroid. In rare cases, they are found within the thyroid gland. Even with recent advancements in ultrasound (US), Tc-99m sestamibi scintigraphy, and computed tomography (CT) scan, preoperative localization of intrathyroid parathyroid adenomas (IPA) may be difficult. Surgeons may occasionally be required to make an intraoperative diagnosis and perform an unplanned hemithyroidectomy. Case description: A 34yo Hispanic female was referred due to complaints of multiple episodes of nephrolithiasis, recent onset of arthritis in her hands and wrists, bilateral hearing loss, and fatigue. Her labs showed 130 pg/mL PTH, 11.0 mg/dL Ca, and 6.1 mg/dL ionized Ca. Further workup with US imaging and sestamibi scintigraphy revealed a single left parathyroid adenoma. The patient subsequently underwent a selective parathyroidectomy. Intraoperatively, the posterior aspect of the gland was looked over carefully to locate the parathyroid adenoma as previously seen on US. However, no adenoma was visualized on the superior or inferior poles. A decision was made to resect the left thyroid lobe. The resected specimen was then sent to pathology for an intraoperative frozen section examination, which confirmed the presence of the IPA. Conclusion: A definitive preoperative diagnosis of IPA may be limited with current imaging modalities. Our case report suggests that an IPA can be diagnosed intraoperatively using frozen section following a careful exploration.

Secondary Amenorrhea in OHVIRA Syndrome

Abstract ID: UNTHSC350 Research Area: Pediatrics & Women's Health Presenter: Emma Kiefer Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (3rd Year)

Author(s):

- Emma Kiefer
- Alison Pasciucco
- Biren Patel

Abstract:

Background: Obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) syndrome is a rare obstructive $M\tilde{A}^{1}$ /allerian duct anomaly (MDA) producing pelvic pain, dysmenorrhea, and urinary retention. Exact prevalence of MDAs is difficult to ascertain, but studies quote those that are obstructive in nature at up to 7% of the general population. Case Presentation: A 21-year-old Caucasian nulligravida female presented for a well woman exam with no acute complaints and secondary amenorrhea for one year. She reported OCP use for many years but discontinued their use a year prior to her visit. A withdrawal bleed occurred following use of over the counter levonorgestrel (Plan B) a month prior to initial presentation. Menarche was reached at age 14 and cycles were irregular, occurring on average once every 40 days. Further gynecologic history revealed current sexual activity without pain or concern, no previous STIs, no prior pap smear, and no known breast disease. Medical, surgical and family histories were unrevealing, but social history detailed occasional alcohol and tobacco use. She denied pelvic pain, vaginal discharge, vaginal bleeding, or dyspareunia. The patient was afebrile and vital signs were unremarkable. A general physical examination showed no abnormalities. A genitourinary examination was significant for a large anterior mass effect to the hymen, a non-visible, non-palpable cervix, an enlarged, non-tender uterus spanning from just below the umbilicus to the distal vagina, and nonpalpable adnexa. The anterior vaginal wall was bulging and exhibited loss of a rugae pattern prompting additional imaging studies. Preliminary abdominal and pelvic ultrasound indicated both adnexa were within normal limits and the mass was uterine in origin, fluid filled, and suspicious for hematometra. MRI findings revealed absence of the right-kidney and hematometrocolpos with suspicion of a complete septate uterus and vagina necessitating surgical evaluation. Surgical management entailed opening of the hemivagina, irrigation and drainage of the hematometrocolpos, and complete excision of the hemivagina. Intraoperative hysteroscopy revealed two uterine moieties with no connecting plane, an entirely normal left moiety and ostia, and normal vaginal mucosa in the previously occluded right hemivagina. There were no post-operative sequelae. A follow-up pelvic sonogram
showed a uterine didelphys and the formal diagnosis of OHVIRA syndrome was given. Conclusion: This case further expands the heterogeneity of clinical presentations and contributes to the limited data pool of OHVIRA syndrome

Assessment of Sex Differences Following Repeated Mild Head Injuries

Abstract ID: UNTHSC349 Research Area: Neuroscience Presenter: Aakaash Duggal Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: GSBS Student

Author(s):

- Aakaash Duggal
- Philip Vann
- Daniel Metzger
- Affan Ahmed
- Nathalie Sumien
- Derek Schreihofer

Abstract:

Background: Traumatic brain injury (TBI) is a major cause of disability, morbidity, and mortality in the U.S. Although there is a growing understanding of the effects of moderate and severe TBI, less is understood about the effects of repetitive mild TBI (rmTBI). Nevertheless, some studies show that long term participants in contact sports have an increased risk for neurodegenerative disease. In addition, there is limited information about sex differences in TBI, despite some studies suggesting females participating in contact sports experience more head injuries than males. With an increasing number of females participating in contact sports, it's important to explore the effects of rmTBI in females. Purpose: This study will test the hypothesis that rmTBI will lead to more severe neurological deficits in female mice than in male mice. Methods: C57BL/6 female mice were assigned to sham and rmTBI groups (n=30/group). Lightly anesthetized mice received 25 mild head injuries, once a day (M-F) over 5 weeks using a weight drop model that included a free fall with rotational injury. Acute effects of injury were assessed by righting reflex and balance beam tests weekly. Chronic effects were tested with rotarod, Morris water maze (MWM), elevated plus maze (EPM), and T-maze beginning 5 or 25 weeks after the last injury. Effects in female mice will be compared to previously collected data in male mice. Inflammation and white matter injury will be assessed with western blotting and immunohistochemistry, respectively. Results: Acutely, rmTBI female mice performed worse than sham injured mice on the balance beam (F (1,28) = 4.309, P=0.0472) whereas there was no difference in males. Five weeks after injury, both male and female mice in the rmTBI group performed significantly (T-test P < 0.01) worse on the Rotarod. Neither males nor females displayed deficits in cognition on the T-Maze or learning phase of the MWM, although males had a significant impairment on MWM memory (Probe T-test P< 0.05). Neither sex showed deficits in the EPM. Fifteen weeks after injury, male mice displayed significant deficits in learning in the MWM (T-test P< 0.05) and EPM (T-test P< 0.05). Male mice in the rmTBI group also showed increased astrogliosis and Tau phosphorylation in the cerebral cortex compared to sham injured mice. Additional assessments of white matter injury are planned, but assessment of female mice 15 weeks after injury is incomplete at this time. Conclusion: Acutely, female mice showed balance deficits that were not apparent in males. Five weeks after injury, both sexes continued to show motor deficits on the rotarod, but only males had mild deficits in cognition. Ongoing studies will assess whether these differences persist or new differences between males and females appear chronically. AUP: 2021-0035

Glaucoma-associated stretch of optic nerve head astrocytes drives changes in glycolysis bioenergetics and glutamine dependency

Abstract ID: UNTHSC347 Research Area: Eye / Vision Presenter: Eric Yin Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

- Eric Yin
- Nate Pappenhagen
- Denise Inman

Abstract:

Purpose: Glaucoma is an optic neuropathy that leads to irreversible blindness, often through a chronic increase in intraocular pressure which promotes a stretch injury to the optic nerve head. In rodents and humans, the predominant glial cell in this region is the optic nerve head astrocyte (ONHA). Since this region of the optic nerve is unmyelinated, the ONHAs provide neighboring axons with metabolic support, likely in the form of lactate produced through astrocytic glycolysis. Previously, we found that exposing astrocytes to glaucomaassociated deformation altered their metabolism in ways that indicated stronger commitment to and upregulation of glycolysis. Here, we explore the predominant source supplying the requisite carbon for TCA cycle intermediates that this stretch-induced glycolysis upregulation demands; our hypothesis is that glutamine metabolism plays a major role in this mechanism. Methods: Primary ONHAs were cultured from P5 rat pup optic nerve head explants. Metabolic changes in ONHAs were investigated by subjecting them to 24h of 12% biaxial stretch at 1Hz. The cells' bioenergetics were measured using a Seahorse XFe24 Analyzer. Protein markers for glycolysis and other cellular metabolism pathways were measured using a ProteinSimple Jess Automated Western Blot Analyzer. Results: We observed significant glycolytic and respiratory activity differences between control and stretched ONHAs, including greater extracellular acidification and lower ATP-linked respiration, yet higher maximal respiration and spare capacity in stretched ONHAs. We determined that both control and stretched ONHAs displayed a dependency upon glutamine over pyruvate or long-chain fatty acids for fuel. We also found increased proteome markers of glutamine metabolism such as glutamine synthetase, and glycolytic lactate production through increased lactate dehydrogenase-a, in stretched ONHAs when compared against that of control. Conclusions: Our results of extracellular acidification rate, fuel flexibility studies, and various metabolic proteome markers suggest that ONHAs, after being subjected to glaucoma-associated stretch deformation, show a preference for the increased

use of glycolysis over oxidative phosphorylation, and glutamine over other sources of TCA cycle carbon intermediates. Therefore, stretch alters ONHA bioenergetics to support an increased demand for internal and external energy. This is significant as these altered bioenergetics could potentially inhibit ONHAs from providing metabolic support to neighboring retinal ganglion cell axons, further advancing the axonal degeneration commonly associated with glaucoma.

Heard But Not Understood: Language Style Matching As a Predictor of Sentinel Events Among Nursing Staff

Abstract ID: UNTHSC344 Research Area: Patient Safety Presenter: Jack Burrows, MS Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Jack Burrows
- Robert Arrowood

Abstract:

Purpose: Communication plays a significant role in maintaining the daily workflow and safety of patients in a healthcare setting. In recent years, there has been increased interest in understanding how communication can affect sentinel events, adverse events, and near misses in a hospital setting. Previous studies have shown that a significant percentage of adverse events were precipitated as a result of communication failures during hall handovers at shift changes and during patient transfers. Therefore, effective communication is necessary to avoid unintentional harm to patients in a healthcare setting. This study examines language style matching (LSM), the action of matching another person's speech pattern based on nine sets of function words, in writing or conversation, between active nurses and nurse residents to evaluate whether teams with a high level of LSM will be associated with fewer sentinel events, near misses, and adverse events compared with teams with lower language style matching. Past studies have examined LSM in romantic relationships as well as corporate environments (Gonzales et al., 2010; Ireland et al., 2011; Tausczik & Pennebaker, 2010), however, this is the first study relating to nursing teams. Methods: Trained researchers administered a survey consisting of basic demographic information, list of closest coworkers, and self-reporting of adverse events. The survey also included a writing prompt (adapted from Pennebacker (2012)) "@"@Since time immemorial, laymen have doggedly adhered to pearls of folk wisdom such as, "œBirds of a feather flock together" or "copposites attract." These platitudes are unquestionably simplistic. Nevertheless, one of the two is bound to be a close approximation of the truth. Which phrase do you believe is more accurate and why? Please spend about 5 minutes on your response." . Then, after data collection, utilizing named coworkers, 58 pairs were formed and LSM and self-reported adverse event data were analyzed using LIWC software. Results: Two logistic regression analyses were conducted. Repeat data was controlled in the first step of the model. Results showed a negative trend between LSM and near misses such that higher LSM was associated with a reduced likelihood of a near miss , b = -30.37 (S.E. = 23.72, Wald \ddot{I} = 1.64, p = .20, odds ratio < .01, 95% C.I. = .001, 10069714.4.

Furthermore, a significant positive trend was observed between LSM and sentinel events such that lower LSM was associated with a reduced likelihood of a sentinel event b = 9.27 (S.E. = 7.06), Wald \ddot{I} = 1.73, p = .19, odds ratio < .10577.39, 95% C.I. = .01, 10711997526.96. Conclusions: Due to the reduced likelihood of near misses associated with higher LSM between individuals, further study is warranted. It is likely that the observed positive relationship between LSM and sentinel events is an artifact of data due to the small sample size. However, this research is applicable as a potential screening tool for team curation in a healthcare setting in order to reduce the overall number of near misses in patient-care.

Pleural Effusion as an Unusual Complication in a Woman with Primary Sjögren's Syndrome: A Case Report

Abstract ID: UNTHSC342 Research Area: General Medicine Presenter: Jack Healy Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Jack Healy
- Rehan Malik

Abstract:

BACKGROUND: Sjögren's syndrome (SS) is a chronic, systemic, autoimmune condition causing lymphocytic damage to exocrine glands. Immune-mediated dysfunction of the lacrimal and salivary glands leads to the classic symptoms of SS: dry eyes (xeropthalmia) and dry mouth (xerostomia). The combination of these two symptoms is also known as sicca syndrome. Sjögren's Syndrome is classified as either primary (occurring in isolation, without another diagnosed autoimmune condition) or secondary (occurring with a comorbid autoimmune disorder, such as systemic lupus erythematosus or rheumatoid arthritis). In addition to sicca symptoms, patients with Sjögren's Syndrome may have extra-glandular involvement in multiple organ systems. Lung manifestations most frequently involve the airways and interstitium. Inflammation usually spares the serosa (pericardium and pleura), and pleural effusion in this population is rare (< 1% reported incidence). CASE INFORMATION: A 79-year-old female with primary Sjögren's syndrome presented to the ED for chest pain. Her medical history also included COPD, anemia, and atrial fibrillation with previous cardioversion. She described the pain as sudden onset, bilateral, squeezing chest discomfort that awoke her from sleep earlier that morning. Her pain was exacerbated by lying down and inspiration, and non-responsive to over-the-counter analgesics. She endorsed dyspnea and vomiting but denied cough, diaphoresis, or pain radiating to her jaw or back. In the ED, she was tachypneic but otherwise in stable condition. She was admitted for further evaluation and treatment. Workup for ACS, heart failure, COPD exacerbation, pneumonia, pneumothorax, flu, and Covid-19 were negative. CT and X-ray suggested new bilateral pleural effusions with no evidence of embolism. Thoracentesis drained 870 mL of fluid and confirmed the diagnosis. Analysis of the collected sample showed weakly exudative pleural fluid with a protein ratio of 0.58, and cytology negative for malignancy. After eight days of supportive care (IV furosemide and respiratory therapy) she was discharged in stable condition, with evidence of resolving pleural effusion on imaging. CONCLUSIONS: The pulmonary structures typically involved in Sjögren's syndrome are the airways and interstitium, not the pleura. The most commonly seen pulmonary compilations in SS are

pneumonitis, bronchiolitis, and bronchiectasis. As such, this case describes an unusual complication of pleural effusion in the setting of primary Sjogren's Syndrome. The mechanism underlying pleural effusion in SS in unknown. One theory suggests that CD4+ T cells may activate B lymphocytes, which produce autoantibodies against lung tissue, causing buildup of fluid in the pleural space.

Contact Angle as Characterization Method for Vitreous Humor and Vitreous Humor Substitute Gels

Abstract ID: UNTHSC340 Research Area: Pharmaceutical Sciences Presenter: Dylan Jacobsen Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

• Dylan Jacobsen

Abstract:

Purpose: In clinical ophthalmology, intraocular injections and long-acting implants are currently utilized to facilitate controlled drug release into the eye. However, in vivo pharmacokinetic testing not possible due to the inaccessibility of intraocular tissue. This has created a need for bio-relevant in vitro dissolution methods that reflect in vivo pharmacokinetic studies. To achieve that, tissue properties need to be assessed for relevancy to drug release and, if necessary, incorporated into the in vitro dissolution method design and media selection. Currently, synthetic gel substitutes are utilized in ocular drug release studies and release medium viscosity is the primary property that is adjusted to biorelevant ranges to mimic human vitreous humor. Here, surface characterization of vitreous humor is studied as a potential marker to develop biorelevant in vitro release media. To achieve this, contact angle measurements of human vitreous humor, as well as synthetic vitreous humor substitutes, were obtained using an optical goniometer (DataPhysics Instruments USACorp.). It is hypothesized that obtaining contact angle values of these substances allows for more accurate predictability of drug release. Water contact angle is a simple and efficient method to obtain characterization of the hydrophobicity or hydrophilicity of surfaces and this technique has yet to be utilized in vitreous humor studies. Methods: An analysis of eight different samples of human vitreous humor (donated by Dr. Abe Clark, North Texas Eye Research Institute) and a vitreous humor substitute gel formulation made of agar and hyaluronic acid was completed. The synthetic gel formulation has been reported in the literature as a vitreous humor substitute. Both vitreous humor samples and gel samples were deposited on glass microscope slides and allowed to air dry at room temperature for 24 hours. Water contact angle was then measured at multiple points on each slide and the average values of each run were compiled. Human vitreous humor demonstrated two different phases: a viscous, gel-like portion and a thin, watery portion. These phases were separated in each sample and were tested independently. Contact angles were measured at different hyaluronic acid content of the synthetic gel formulation. Results: Water contact angle measurements were reproducible in both the vitreous humor and synthetic gel samples. The gel-like, more viscous phase of vitreous

humor had an average contact angle of 77.46Å \pm 25Ű. In contrast, the less viscous, watery phase produced an average contact angle of 38.31Å \pm 25Ű. The synthetic gel formulation demonstrated a contact angle of 66.79Å \pm 10Ű. Additionally, when altering the concentration of hyaluronic acid in the gel formulation, contact angles were reduced by $8Å\pm2Ű$ with every .05% reduction in concentration of hyaluronic acid. Conclusions: Water contact angle shows promising capabilities as a reliable method of surface characterization of vitreous humor and vitreous humor substitute gels. Our data showed that vitreous humor, but they can be corrected by simple formulation adjustments. Future studies will utilize the method developed here to study the effect of contact angle on controlled drug release studies of intraocular formulations.

A Novel Method to Characterize Invasive Ductal Carcinoma Tumor Biopsies Using Contact Angle Measurements

Abstract ID: UNTHSC338 Research Area: Cancer Presenter: Julio Rincon Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Postdoctoral Fellow

Author(s):

- Julio Rincon
- Ina Mishra
- Michail Kastellorizios

Abstract:

Purpose: The goal of this work is to develop a preclinical method to characterize human breast cancer biopsies of different racial origin. Contact angle measurements are used to assess the biopsies' surface properties and examine possible correlation with race/ethnicity, tumor type, and cancer grade. This method enables us to study differences in interaction of drugs directly in tumor tissues based on available covariate data of the obtained samples. Here, we present a study of 80 invasive ductal carcinoma tumor samples compared against their matching normal and/or cancer adjacent tissues. Methods: To obtain contact angles of tumor tissues, we developed a contact angle instrument capable of delivering a \sim 45 nL drop on top of a 1.5 mm biopsy using a modified goniometer with added custom components (DataPhysics Instruments USA Corp.). The system allows us to measure contact angles from 3 different positions (0Ű, -45Ű, 90Ű), and viewing the tumor tissue through an inverted microscope to determine drop position and quality. For this study, breast cancer tissues were obtained as tumor micro arrays (TMA) and as FFPE tissues with matching normal adjacent tissue. For TMA slides, two drops per tissue were delivered and the test was repeated with a subsequent section of the same TMA, unless the TMA included duplicate cores. For FFPE samples, tissues were processed with a microtome at a thickness of 15 $\hat{A}\mu m$, a minimum of 6 drops were delivered per tissue. Results: Aggregated data showed normal adjacent tissue (NAT) had an average contact angle (CA) of $51.4\hat{A}^{\circ} \hat{A} \pm 6.5\hat{A}^{\circ} n=19$, cancer adjacent tissue (CAT) had an average CA of $62.8\hat{A}^\circ \hat{A} \pm 8\hat{A}^\circ n = 59$, grade 1 tumors had an average CA of 71.1Ű \hat{A} ± 7Ű n=13, grade 2 tumors had an average CA of 67.4 \hat{A} ± 9.1Ű n=49, and grade 3 tumors had an average CA of 64.6Ű Å± 10.3Ű n=11. When comparing normal adjacent tissue against any other tissue, p-values \hat{a} ‰× 0.05 and power \hat{a} ‰¥ 0.80 were observed. When comparing cancer adjacent tissue, only CAT vs NAT and CAT vs grade 2 tumors had p-values â‰× 0.05 and power ≥ 0.80. Individually, 37 cases reached p-values â‰× 0.05 and power ≥ 0.80, were tumor tissue showed

contact angles greater than their NAT or CAT. An additional 7 cases met p-values â‰× 0.05 and power ≥ 0.80, however, tumor contact angles were lower than their NAT or CAT. Finally, ignoring type 2 errors, then an additional 11 cases reached p-values â‰× 0.05. Conclusions: Higher contact angles of deionized water were observed in tumor tissues when compared to matching normal or cancer adjacent tissue. It is clear that breast cancer tumors exhibit surface energy differences from normal adjacent tissues, with cancer tissue being more hydrophobic compared to normal tissue. Future work includes the determination of contact angles of Doxil-like liposomes in these tumors and the determination of surface energy of the tissues.

Unilateral Levator Scapulae Anatomical Variant in Female Cadaver

Abstract ID: UNTHSC337 Research Area: Structural Anatomy Presenter: Alexander Frangenberg Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

- Alexander Frangenberg
- Cara Fisher

Abstract:

Background The levator scapulae (LS) muscle is a superficial extrinsic muscle of the back, most commonly originating on the posterior aspect of the transverse processes of the first through fourth cervical vertebrae and inserting on the superior aspect of the medial border of the scapula. These attachment sites further indicate the action of the LS, which along with the trapezius and rhomboid muscles, function to elevate the scapula during overhead upper extremity movements and shrugging of the shoulders. This elevation of the scapula also causes the scapula to rotate clockwise, thus tilting the glenoid cavity inferiorly. If the scapula is fixed, the LS may also function to rotate the neck laterally at the cervical attachment points. The most common pathology of the LS is termed "œlevator scapulae syndrome" and is commonly due to poor posture, resulting in chronically achy, tight, and tender neck muscles that may impede movement and illicit excess pain. Case Information Dissection of the posterior cervical region and deep upper back on an embalmed 41-yearold female cadaver revealed a unilateral accessory muscle of the left LS muscle. This accessory slip inserted perpendicularly onto the broad aponeurotic fibers of the serratus posterior superior muscle, deep to the rhomboid major muscle. This anatomical variant is present in the literature and is a common site of accessory muscle attachment for the LS. Conclusions This case report describes the anatomical findings in-depth and discusses their prevalence in the literature. Interestingly, the literature indicates a higher predominance of unilateral LS accessory muscles in women compared to men, and this case report further supports this finding. Damage to the LS may be caused by high-velocity injuries, however, the most frequent presentation is implicated in cases of chronic neck pain due to poor posture. Due to the high rates of neck pain diagnosis in U.S. adults from an increasingly sedentary and technology-prevalent lifestyle, variations in muscular anatomy to the LS should not be overlooked. Such variations could play a role in the presence of chronic neck pain through the interaction with vascular and neurologic factors and should be considered during diagnosis and surgery of the region.

Assessment of Mitochondrial DNA Damage in Cognitive Impairment via NGS: Health Disparities in Mexican Americans

Abstract ID: UNTHSC334 Research Area: Aging / Alzheimer Presenter: Danielle Reid Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Danielle Reid
- Robert Barber
- Jie Sun
- Roland Thorpe
- Zhengyang Zhou
- Nicole Phillips

Abstract:

Mexican Americans (MAs) are the fastest growing subpopulation in the US, and as age increases, this population will be disproportionately affected by age-related diseases such as Alzheimer's disease (AD). Diabetes, stroke, depression, and obesity are common risk factors for developing cognitive impairment (CI) and may be of particular relevance to MAs due to their increased prevalence. MtDNA damage has been implicated in AD, and since metabolic comorbidities are more common in MAs, mtDNA damage and mitochondrial dysfunction may be related to the increased burden and earlier age-of-onset among MAs. Mitochondrial dysfunction can induce oxidative damage to guanosine (80x0G) and cause DNA deletions, both of which have been well-documented in AD. The mitochondrial genome is particularly vulnerable to DNA damage, and age-associated decline in mitochondrial function results in accumulating reactive oxygen species capable of damaging essential biomolecules. We hypothesize that MAs incur mtDNA damage at an elevated rate due to increased comorbidity burden altering mitochondrial function. MtDNA from buffy coat and plasma samples of participants enrolled in the Texas Alzheimer's Research Care and Consortium were amplified using the RepliG mtDNA Amplification kit and were sequenced via NexteraXT on Illumina NextSeq. Somatic variants indicative of oxidative DNA damage and the commonly observed 5kb deletion were quantified in both the buffy coat mtDNA and ccf-mtDNA. These data were analyzed for association with CI and T2D in both the NHW and MA populations. Further, haplogroup-associated risk for mtDNA damage and ccf-mtDNA status was assessed. Our preliminary findings suggest clinical implications of oxidative mtDNA damage as a risk factor for CI specifically in MA females. These data highlight ethnic/racial differences in oxidative burden which may elucidate sex-specific mechanisms contributing to the manifestation of

age-related disease etiology as AD, and the results may ultimately inform precision-based approaches to design therapeutics for mitigating AD disparities in the MA population.

The Impact of COVID-19 on Access to Insulin and Other Supplies among Patients with Diabetes

Abstract ID: UNTHSC333 Research Area: Diabetes Presenter: Megan Jodray Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Megan Jodray
- Haley McKeefer

Abstract:

Purpose: Diabetes is a well-researched primary prevalent comorbidity among patients infected with COVID-19; however, there is little literature on the management of Type 2 diabetes during government-mandated quarantine periods. To our knowledge, there is no literature assessing the impact of COVID-19 on diabetic management in an underserved population in the outpatient or ambulatory care setting. The PROMIS (Partnership in Resilience for Medication Safety) research team was tasked to understand how diabetes was managed in the outpatient setting in an underserved patient population. Our study objective is to explore the impact COVID-19 had on patient access to insulin, other diabetic therapeutics, and diabetic supplies in the outpatient setting. Our secondary objective is to describe if differences in diabetic management occurred between patients who utilized telehealth vs inpatient appointments. Methods: A retrospective analysis of deidentified claims data from HSC Health and John Peter Smith (JPS) Health Network was performed. Hemoglobin A1c (HgbA1c), type of visit (telehealth vs in-person), and number of appropriate diabetic management changes were compared between two cohorts, a pre-COVID-19 cohort (May 2019""April 2020) and a COVID-19 cohort (May 2020""July 2020). Adult patients were included in the study if they had at least one HgbA1c in both time periods. Controlled HgbA1c results were defined as < 7. Evaluation of appropriate diabetes was defined by the American Diabetes Association 2021 Standards of Medical Care in Diabetes guidelines. Results: Pending. Conclusion: Analysis of drug regimen changes, HgbA1c changes, and telehealth utilization between the cohorts will provide insight into access barriers and how changes to therapeutic regimens were implemented as a result. These important findings will shed light on the impact of COVID-19 on diabetes care and prompt value considerations for pharmacists, physicians and other health care professionals in their diabetic management.

Pursuit of an Optimal Murine Model for Early Life Stress: Does Diet Matter?

Abstract ID: UNTHSC332 Research Area: Immunology Presenter: Jamie Y. Choe Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Jamie Choe
- Harlan Jones

Abstract:

Early life stress (ELS) is known to have negative effects on long-term human health. Neglect is a significant source of ELS during childhood and accounts for 80% of reported abuse and over 30% of maltreatment-related deaths in the United States. A major challenge of studying the impact of stress on immune competency has been difficulty developing a reliable mouse model with reproducible stress effects. Animal models of ELS emulate the nature of childhood neglect through scheduled separation. Although variations of maternal separation in rodents have been published, the reported results are inconsistent. This may in part be attributed to variations in animal housing conditions between research institutions, such as diet. In the present study, we describe a modified version of the maternal separation with early weaning (MSEW) paradigm using C57BL/6 mice and compare the effects of two commercially available diets (ClearH2O® DietGel® and PicoLab® 5058) on peripheral stress hormones and cytokine profiles of select primary and secondary lymphoid tissues. Pups were produced via in-house breeding procedures and subjected to our modified MSEW protocol. Euthanasia occurred at postnatal day (PD) 21 for tissue harvest and blood collection via cardiac puncture. Cytokines and serum catecholamine and corticosterone levels were detected using commercially available ELISA. This pilot study sheds light on the impact dietary variations have on immune outcomes in the context of stress. We describe an updated MSEW protocol in C57BL/6 mice and demonstrate diet is a critical component of our stress model. Preliminary data suggests diet affects cytokine production within select lymphoid tissues at PD21. This work provides insight into the need for MSEW diet standardization to improve the reliability and reproducibility of murine models designed to study ELS.

Sex Differences in Oxidative Stress Model of Prodromal Parkinson\'s Disease

Abstract ID: UNTHSC331 Research Area: Aging / Alzheimer Presenter: Steve Mabry Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: GSBS Student

Author(s):

- Steve Mabry
- Elizabeth Wilson
- Joel Little
- Steven Romero
- Rebecca Cunningham

Abstract:

INTRODUCTION: Parkinson's disease (PD) is an incurable neurodegenerative disorder that causes deterioration in motor and cognitive function and occurs more commonly in men. Gross motor impairment occurs after 60% dopaminergic neurons are lost in the substantia nigra brain region. However, it is unknown if sex differences are present in the prodromal stage of PD in which no dopaminergic neuronal loss or gross motor dysfunction are observed. Prodromal PD is associated with increased oxidative stress (OS) and OS damage in the substantia nigra, along with cognitive and fine motor skill dysfunction. To examine if sex differences are present in prodromal PD, we will use an animal model, chronic intermittent hypoxia (CIH), that recapitulates many prodromal PD characteristics. Our prior studies using male rats found that CIH induced global OS, OS damage in the substantia nigra, and cognitive dysfunction, which are all consistent with prodromal PD. METHODS: Adult male and female Sprague Dawley rats were exposed CIH to induce a prodromal PD phenotype. The CIH protocol consisted of 10 episodes of hypoxia (12% O2)/hour for a total of 8 hours/day over a 2-week period. Control rats were exposed to room air (normoxia). Rats were behaviorally tested for the following indexes during the last week of CIH exposure: 1) cognitive function (novel object recognition, Morris Water Maze), 2) fine motor behavior (modified open field with an elevated wire mesh), and 3) anxiety (marble test). At the conclusion of behavior testing, rats were sacrificed. Plasma and brain tissue was collected to examine oxidative stress. RESULTS: CIH increased circulating oxidized proteins in both male and female rats compared to control rats. No sex difference was observed in CIH induced circulating oxidative stress. Preliminary analysis indicate that sex differences are present in behavioral tests, especially cognitive function. CONCLUSIONS: These studies indicate sex differences in response to OS. CIH induced OS was consistent across both sexes, as evidenced by similar circulating OS levels. However, each sex responded

(behaviorally) differently in response to CIH induced OS. These studies indicate that sex differences may be involved in prodromal PD. Knowledge of these sex differences could lead to earlier detection of PD and possibly the ability to slow conversion of prodromal PD to later stage PD that is exemplified by gross motor loss.

Hydroxyethyl Starch-Enhanced Flush Initially Minimizes but Ultimately Exacerbates Edema of Machine Perfused Porcine Kidneys

Abstract ID: UNTHSC328

Research Area: Integrative Physiology Presenter: Michael Wade Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: Dual Degree Student

Author(s):

- Michael Wade
- Katherine Ramos
- Ashraf Reyad
- Arthur Williams
- Albert Yurvati
- Robert Mallet
- Casey Horani

Abstract:

Hydroxyethyl Starch-Enhanced Flush Initially Minimizes but Ultimately Exacerbates Edema of Machine Perfused Porcine Kidneys. Michael Wade, Katherine Ramos, Casey Horani, Ashraf Reyad, Arthur G. Williams Jr., Albert H. O-Yurvati, Robert T. Mallet. PURPOSE: Improved preservation of explanted kidneys is essential to narrow the supply vs. demand disparity for transplantable human kidneys. Edematous expansion of the explanted organ may make explanted kidneys unsuitable for transplant. This study evaluated the impact of initial flushing of porcine kidneys with a solution containing hydroxyethyl starch (HES), an osmolyte commonly used in preservation solutions for kidney transplantation, on edema during subsequent hypothermic machine perfusion METHODS: This study utilized kidneys from Yorkshire swine due to the anatomical and functional similarities of porcine and human kidneys. Left kidneys were harvested from isoflurane-anesthetized pigs via laparotomy. The renal artery was cannulated and the organ was flushed for 10 min with 400 mL of control Ringer's solution (group A) or with Ringer's solution containing 50 g/L hydroxyethyl starch (group B). Kidneys then underwent hypothermic machine perfusion (2-4°C) for 21-72 hr in a LifePort organ preservation system, with flow rates and resistance recorded throughout perfusion. The kidneys were weighed before and after flush of the organ, weighed again after machine perfusion, and then biopsied for histological analysis of renal cortex and medulla. RESULTS: Group A kidney mass increased by 49 Å \pm 13% (mean Å \pm standard deviation) during initial flush (n =7) and by 52 \hat{A} ± 14% after flush and 72 h machine perfusion (n=8); thus, 95% of the organ expansion occurred during the initial flush. In contrast, Group B kidney mass increased by 19 \hat{A} = 9% during initial organ flush (n=6), a

60% reduction vs. Group A (P < 0.001), but total weight gain was 83 ű 21% after machine perfusion (n=3). Machine perfusion of 2 of the 3 Group B kidneys failed at 21 hr and 23 hr perfusion, and only 1 was perfused for the entire 72 hours. In both groups, histology revealed preserved tubular and glomerular architecture, but appreciable cellular edema following machine perfusion. Accumulation of debris in the tubular lumina and vacuolization of tubular epithelial cells was evident in Group B, but not Group A. CONCLUSION: In explanted kidneys flushed with colloid-free Ringer's and machine-perfused for 72 h, almost the entire increase in mass occurred during the initial organ flush. As hypothesized, the addition of HES colloid sharply lowered the initial organ expansion, but unexpectedly exacerbated organ expansion during subsequent hypothermic machine perfusion, such that the HES-flushed kidneys gained more mass than the controls flushed without HES. Thus, the potential benefit of including HES in the initial flush solution was lost during machine perfusion. Arguably, the excessive expansion may have contributed to the impaired machine perfusion of these kidneys. Animal Use Protocol: IACUC-2020-0011

Histopathologic Characterization of Lichen Planopilaris, Frontal Fibrosing Alopecia, and Central Centrifugal Cicatricial Alopecia

Abstract ID: UNTHSC326 Research Area: Other Presenter: Henry Lim Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Henry Lim
- Suhhyun Kim
- Parneet Dhaliwal
- Clay Cockerell

Abstract:

Intro Lichen Planopilaris (LPP), Frontal Fibrosing Alopecia (FFA) and Central Centrifugal Cicatrical Alopecia (CCCA) are a lymphocytic group of primary cicatricial alopecias (PCA) that are often histologically and immunophenotypically indistinguishable. When left untreated, they result in irreversible hair loss that often results in mental anguish and disturbed self-perception. Clinical overlap of symptoms such as scalp pain or pruritus, follicular hyperkeratosis and perifollicular erythema often require the involvement of characteristic sites and scalp biopsy to make a more definitive diagnosis. Overlap in histopathologic features limits current diagnostic evaluation but also alludes to a common pathomechanism with potential clinical implications. Due to the lack of any controlled study regarding the treatment of these PCAs, current treatment is guided by available case reports and expert opinion. These options with varying efficacy include the use of steroids, calcineurin inhibitors, 51±-reductase inhibitors, Janus Kinsase (JAK) inhibitors, hypoglycemic drugs, and over the counter products. The purpose of this study was to characterize histopathologic similarities between LPP, FFA, and CCCA in order to better define these entities and guide therapeutic targets. Methods A minimum of 25 histologically confirmed cases of LPP, FFA, and CCCA H&E slides were re-examined by a trained dermatopathologist to investigate the common histological findings. Results All across LPP, FFA, and CCCA, there were features of lymphocytic infiltrate particularly around the mantle zone area along with perifollicular fibrosis. The inflammatory infiltrates predominantly consisted of lymphocytes, and the only presence of neutrophils was secondary to rupture of follicles. Conclusion To our knowledge this is the largest case series comparing histological features of LPP, FFA, and CCCA. As these three alopecia exhibit similar pathological changes, it may suggest that they are clinical variants of the same disease process. Current data in the literature has yet to demonstrate a consensus on content of lymphocytic infiltrate and

trigger for lymphocytic migration. Future direction of treatment innovations should thus focus on early detection, prevention of scalp trauma, and therapies that target early lymphocytic changes.

Incidental finding of gallbladder adenocarcinoma in the 2nd trimester of an otherwise healthy pregnant woman.

Abstract ID: UNTHSC325 Research Area: Cancer Presenter: Spencer Cushen Submission Type: Competition Poster Department: TCOM: Medical Education Classification: Dual Degree Student

Author(s):

- Spencer Cushen
- Shankar Logarajah
- Wareef Kabbani
- Houssam Osman
- Rohan Jeyarajah

Abstract:

Background Pregnancy causes an increased production of steroid sex-hormones resulting in more cholesterol laden bile and decreased gallbladder emptying. This results in greater incidence of gallbladder disease in pregnant women with 10% of pregnant women developing gallstones or sludge and a further 1% of these developing symptomatic disease. In addition to simple gallstone disease, multiple pregnancies increase the risk of gallbladder in cancer. In this Case Report, we present what is, to our knowledge, the first report of incidental gallbladder adenocarcinoma in an otherwise healthy pregnant woman. Case Presentation A 36-year-old woman presented to the emergency department with right upper quadrant abdominal pain at 16 weeks of gestation. A clinical picture of acute cholecystitis was developed and confirmed by ultrasound demonstrating sonographic Murphy's sign, gallbladder containing gallstones, 2 mm thick gallbladder wall, and pericholecystic fluid. This patient then underwent laparoscopic cholecystectomy. Routine pathologic assessment of the gallbladder demonstrated a 3.9 cm calculus, 2.5 cm wide high-grade dysplasia, and a 1.0 cm invasive, moderately differentiated adenocarcinoma. This malignant lesion extended through the wall of the gallbladder, giving it a tumor classification of pT2a. The patient was then referred to the hepatopancreaticobiliary (HPB) surgery service for completion of an extended cholecystectomy as indicated to stage the cancer and remove additional disease. After this surgery no lymph nodes, cystic duct margins, or liver sections collected for pathology demonstrated malignancy, giving the final TNM classification of pT2aN0M0R0, Stage IIA. On 6 month follow up patient had received chemotherapy and was free of evidence of malignancy on MRI. Conclusions To our knowledge this is only the second case report demonstrating a pregnant woman being diagnosed with gallbladder cancer. In the other report, the woman had Crohn's disease and gallbladder changes consistent with Crohn's disease. Therefore, this is the first presentation of an otherwise healthy pregnant

woman being incidentally diagnosed with gallbladder cancer after acute gallstone disease. This report adds to the current understanding of pregnancy induced gallstone disease by providing a rare end point to such disease processes.

Targetable Factors for Prevention of Hypoglycemic Events in Pediatric Acute Lymphoblastic Leukemia Patients

Abstract ID: UNTHSC323 Research Area: Cancer Presenter: Ayushi Sahu Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Ayushi Sahu
- Ishna Sharma

Abstract:

Purpose: Hypoglycemia is a thought-to-be rare complication of 6-mercaptopurine (6MP), a drug used in pediatric acute lymphoblastic leukemia (ALL) treatments. However, there is little data on hypoglycemia prevalence during treatment with 6-MP and/or other risk factors. Through this study, we aim to evaluate the epidemiology and risk factors that contribute to hypoglycemia during ALL therapy within the pediatric patients group. Methods: ALL patients \hat{a} ‰×18 years of age, who actively received therapy between 2010 and 2017, were retrospectively reviewed. Data included age, sex, number of hypoglycemic episodes, blood sugar levels, scheduled procedure days pre- and post- maintenance, fasting duration, and thiopurine methyltransferase (TMPT) genotype. Patients were considered hypoglycemic if at least one glucose measurement was < 60 mg/dL. Results: Eighty-six patients met inclusion criteria, 41 (47.7%) in the normoglycemic and 45 (52.3%) in the hypoglycemia subgroups. Maintenance therapy decreased risk of developing hypoglycemic episodes (RR=0.749, p=0.0001). Procedure days (e.g., prolonged fasting) increased the risk of hypoglycemic events both before (RR=1.8378, p=0.0035) and during (RR=1.70, p=0.0005) the maintenance phase. Indeed, procedure days increased the risk of experiencing severe mean blood glucose levels by 1.56 (RR=1.56, p=0.3454). Those $\hat{a}_{\infty} \times \hat{a}_{\sigma}$ blood glucose levels by 1.56 (RR=1.56, p=0.3454). times increased risk of experiencing hypoglycemic during treatment (RR=1.7421, p=0.0357). Conclusion: Prevalence of hypoglycemic events among pediatric patients receiving ALL therapy is greater than previously thought. Often, these episodes go unnoticed and thus are not treated. Providers, patients, and caregivers should be educated on hypoglycemic complications resulting from ALL therapy and tailor vigilance for episodes based on age and fasting length.

Unfixed Cadavers as an Adjunct to the Texas College of Osteopathic Medicine POCUS Curriculum

Abstract ID: UNTHSC322 Research Area: Education Presenter: Alexander Thomas Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Alexander Thomas
- Min Ji Son
- Garrett Jackson
- James Oh
- Taylor Terlizzese
- Debini Banh
- Jack Burrows
- Shanon Quach
- Rahul Vedantam

Abstract:

PURPOSE: Point of care ultrasound (POCUS) continues to grow in its application across all primary care settings due to its wide ranging use and high level of patient safety, especially during medical procedures and aiding in diagnostic accuracy. Advanced technological capabilities in conjunction with affordability gives handheld ultrasound devices the ability to acquire higher quality videos and real time images that are conducive for teaching. Due to these factors, many medical schools are incorporating the use of POCUS into their curricula, including the Texas College of Osteopathic Medicine (TCOM). POCUS is introduced in year 2 as a part of the SIM Lab to help promote development of clinical skills and reasoning. This is implemented via a two-part process in which, alongside systems classes, students complete Sonosim modules that teach about using POCUS on various organ systems. Students then, as part of a skills lab, are aided by student teaching assistants and faculty on proper screening technique utilizing a student volunteer. One key limitation, however, is the fact that the majority of the student volunteers are healthy medical students, which makes it harder to screen for pathology. Due to this limitation, the use of fresh, unfixed cadavers could be a useful adjunct to allow students to further sharpen their POCUS skills while simultaneously seeing pathology in real time. METHODS: A total of 27 unfixed, de-identified cadavers were scanned with a handheld Butterfly iQ+ probe. Sixteen body systems were screened: ocular, thyroid, carotid/internal jugular vein (IJV), brachial plexus, heart, kidneys, pancreas, gallbladder, liver, aorta and the inferior vena cava (IVC), femoral artery and vein, knee, popliteal vessels, uterus, scrotum, and shoulder. RESULTS: Of the 16 body systems,

we were able to consistently capture anatomical and pathological images in 8. The body systems that we saw in more than 70% of the screened cadavers include: ocular, thyroid, carotid/IJV, brachial plexus, liver, knee, scrotum, and shoulder. An ultrasound-skilled physician reviewed the images obtained from the cadavers and concluded that for certain body systems the images acquired were indiscernible from anatomy obtained from live patients. Additionally, pathologies discovered in unfixed cadavers were similar to the pathologies seen in live patients. These pathologies include: vitreous detachment, thyroid nodule, liver cyst, hydrocele, and others. CONCLUSION: Ultrasound on unfixed cadavers can be a useful adjunct to the current TCOM ultrasound curriculum. Using cadavers allows room for error and cadavers often have common pathology throughout their system that are rare in healthy student volunteers. Prospective studies should include assessing more body systems and introducing procedures that parallel the current SIM lab curriculum. Additionally, creating artificial pathologies in cadaveric models should be explored to broaden the scope of application.

RISK FACTORS PREDICTIVE OF CLINICAL COURSE IN PEDIATRIC CANCER PATIENTS WITH SIMULTANEOUS SARS-COV-2 INFECTION

Abstract ID: UNTHSC321 Research Area: Cancer Presenter: Ishna Sharma Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (3rd Year)

Author(s):

- Ishna Sharma
- Sahil Noorani
- Angela Liu
- Salma Omar
- Hufsa Ahmad
- Shelley Watts
- Tyler Hamby
- Alice Hoeft
- Suzanne Whitworth
- Anish Ray

Abstract:

The clinical course of actively treated pediatric cancer patients, who are simultaneously diagnosed with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has been thought to be more severe than experienced by the general pediatric population; however, risk factors predictive of clinical severity in this population have not been elucidated. We describe the clinical course, risk factors affecting clinical severity, and management of coronavirus disease 2019 (COVID-19) infection at a single institution. Patients that were diagnosed with SARS-CoV-2 between January 2020 and June 2021 while actively receiving cancer treatment, excluding transplant therapies, were retrospectively reviewed. Data collected included age of SARS-CoV-2 diagnosis, cancer diagnosis, gender, race and ethnicity, age-and-gender-adjusted body mass index at time of the SARS-CoV-2 diagnosis, clinical course and severity, symptomatology, and clinical outcome. Active cancer therapies and COVID-19 specific management given during course of infection were recorded. Of the 33 patients that met inclusion criteria, 14 (42.4%) were asymptomatic during infection course while 19 (57.6%) experienced symptoms, including MIS-C (9.1%). A majority (23 patients, 69.7%) required no institutional support; 10 (30.3%) required hospitalization, of which 80.0% required oxygen, 30.0% required intensive care, and 10.0% required intubation. Eighteen (54.5%) patients had at least 1 pre-existing comorbidity, with obesity as the most common. Obesity increased the odds of hospitalization by 25.5 times

(OR=25.5; p=0.002) and oxygenation requirements by 14.88 times (OR=14.88; p=0.012). Modifications to treatment included 22 (66.7%) patients that experienced delay in cancer care and 10 (30.3%) that received COVID-19 directed therapy. Hospitalization and MIS-C rates for our cohort were significantly higher than that found in the general, healthy pediatric population; mortality rates and predominance of asymptomatic to mild symptoms were consistent with the general pediatric population. Obesity was the only risk factor predictive of clinical severity and complications. Unlike in adults, ethno-race, particular cancer diagnosis, cancer therapy, and lymphopenia presentation at time of diagnosis were not significant predictive risk factors.

Addressing the need for interprofessionalism and bioethics training among medical students to better serve the refugee population

Abstract ID: UNTHSC320 Research Area: Education Presenter: Madison Godsey Submission Type: Competition Poster Department: TCOM: Medical Education Classification: Dual Degree Student

Author(s):

- Madison Godsey
- Suhas Tatapudi

Abstract:

Purpose: As the refugee population in Texas is increasing, in order to provide a patientcentered, comprehensive plan of care, medical students would be well-served to understand how to work within the legal system to address key determinants of health, especially in regards to asylum seekers. Our goal is to implement a training program at UNTHSC that would equip future physicians to better serve their patients when legal and ethical issues arise, prepare them to work in areas of public policy, and conduct research that betters the lives of our communities. As previous literature has shown, this has reciprocal benefit for law students and MPH students who gain insight into the interconnectedness of public health, medicine and law for creating robust opportunities for patient wellness and community health. In light of the recent pandemic and the many worldwide issues pertaining to public health, medicine, law, and ethics, this program will be crucial in establishing a community network of interprofessional resources and applying systemsthinking to patients who are often bereft of adequate medical care or legal assistance. Equipping future physicians here in the DFW area with experience in law, public health and bioethics is pivotal to fulfilling HSC's mission of "œcreating solutions for a healthier community by preparing tomorrow's patient centered physicians and scientists and advancing the continuum of medical knowledge, discovery, and osteopathic care." project, if implemented according to stakeholders' needs, will serve as a foundation for medical professionals to play a role in policy change and advocacy, practice clinical decisionmaking, and bring forth advancements in healthcare. Methods: Utilizing a self-administered questionnaire, 2 cohorts of the Texas College of Osteopathic Medicine were targeted to determine interest and availability within the curriculum. One resembled the "@Pre-Clinical" Clinical School, composed of first and second year medical student responses. The other, denoting the "œClinical"□ era of Medical School, composed of third and fourth year medical student responses. The questionnaire was designed using the Likert scale, carrying a minimum score of 1 (Strongly Disagree) and a maximum score of 5

(Strongly Agree). Statistical analyses were performed using SPSS, to reveal unforeseen gaps in education between both eras of Medical School. Conclusions: Once a need for a new curriculum became apparent, two medical students developed a four-year medical bioethics curriculum. Interested medical students would be trained with five core courses; Philosophy of Bioethics, Medicine and Law, Introduction to Clinical Bioethics, Global Ethics, and Bioethics in Practice. Students would also have elective opportunities to become certified in Medical Evaluation Forensics, as well as conduct research in public health, policy, or bioethics. The curriculum places emphasis on learning through case studies and creates a collaboration with Texas A&M Law school to guide students in clinical decision-making with particular focus on systems-thinking and interprofessionalism construed broadly to encompass law and public policy. Through providing an intellectual space to reflect and partake in group conversations, students will mature professionally to become culturally-responsive, compassionate and innovative physicians.

Qualitative Descriptions of "What is Delta-8 THC"?

Abstract ID: UNTHSC318 Research Area: General Public Health Presenter: Sofia Olsson Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Sofia Olsson
- Cassidy Loparco
- Matthew Rossheim

Abstract:

Background: Delta-8 THC is a chemical isomer of the more common form of THC found in the Cannabis plant, Delta-9. Delta-8 THC retail increased after the 2018 Farm Bill was passed. This bill defined hemp as anything having less than 0.3% Delta-9 THC by dry weight, thus implicitly defining Delta-8 THC as hemp rather than marijuana. The retail of Delta-8 THC is unregulated, and both consumers and retailers may lack an understanding of the substance. This study utilized qualitative responses of retailers selling Delta-8 THC products in Fort Worth, Texas to understand how retailers are explaining the product to consumers. Methods: Retail locations in Fort Worth, Texas with alcohol, CBD, or tobacco retail licenses was compiled (n = 1,777). Retail locations were contacted between September 8 and October 14, 2021, by research assistants to query the retail of Delta-8 THC products. This study utilized a subsample of retail locations (n = 125) that answered the question asking, "@What is Delta-8?" Qualitative analysis was performed by authors SO and CRL. Results: Cohen's kappa was 0.92, indicating a good inter-rater reliability. Many retailers (20.8%, n = 26) reported that they were unsure of what Delta-8 is while 7 (5.6%) told surveyors to look it up themselves. Several retailers (8.8%, n = 11) withheld information, stating they would provide information over the phone. Nearly a quarter (23.2%, n = 29) of retailers made claims on the legal status of Delta-8 THC (e.g., that it was legal), seven (5.6%) of which specifically mentioned the 0.3% Delta-9 THC threshold. Delta-8 THC was often described as a form of marijuana (34.4%, n = 43). Importantly, Delta-8 THC was also frequently described as CBD (19.2%, n = 24) or hemp (7.2%, n = 9), substances without psychoactive effects. Several retailers described the potential effects of Delta-8 (e.g., " ∞ It relaxes you" \Box ; 26.4%, n = 33) or the potency (e.g., " ∞ Not high dose" \Box ; 13.6%, n = 17). Discussion: Comments on the legal status of Delta-8 products may be misleading to consumers as lack of regulation may result in illegal product composition. For example, recent research has found that 76% (n = 51) of Delta-8 products surveyed had Delta-9 THC levels above the legal limit (Johnson 2021). Several retailers verbally withheld information or said they were unsure of what the product is, which may be due to the lack of clarity surrounding Delta-8 THC product composition and/or legality. Retailers often described Delta-8 THC by focusing on psychoactive experiences or potency, rather than an explicit definition of the product, which may be a marketing strategy. Without proper laws regulating the marketing or packaging of Delta-8 THC products, individuals may be unaware of the contents. This may lead to increased consumption, particularly among adolescents and young adults or those not expecting psychoactive effects. Regulation, surveillance, and product definitions of Delta-8 are important to reduce the risk of adverse effects. MIEN1 derived peptides exhibit anti-cancer activities by inhibiting the key pathways viz. epithelial-mesenchymal transition (EMT) and NF-kB signaling in MDA-MB-231 breast Cancer Cells

Abstract ID: UNTHSC317 Research Area: Cancer Presenter: Amit Kumar Tripathi Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Postdoctoral Fellow

Author(s):

- Amit Kumar Tripathi
- Priyanka Desai
- Jamboor Vishwanatha

Abstract:

Purpose MIEN1 is a tumor-specific target protein that promotes cancer cell migration and invasion. MIEN1 is overexpressed in human breast, prostate, colorectal, gastric, ovarian, squamous cell carcinoma and non-small cell lung cancer (NSCLC) with minimal or no expression in normal cells, which makes it an excellent therapeutic target The overall goal of this project is to identify small inhibitory or interference peptides (iPeps) from the native MIEN1 protein, which could achieve the high selectivity for the native MIEN1 protein as well as being able to enter cells and inhibit the intracellular targets Methods Online tools like CASTp server were used to identify pockets or empty concavities on the MIEN1 protein surface into which solvent and other potential inhibitory molecules can gain access. Peptides were designed from the primary sequence of MIEN1 protein using various biophysical parameters and peptide designing tools such as AntiCp and Cancer PPD. Chimera program was used to check if these peptides can bind to MIEN1 protein. The peptides were synthesized and correct molecular weights were ascertained. Biological experiments like MTT and scratch assays were performed. RT-PCR was done to check the ability of the small inhibitory or interference peptides (iPeps) to inhibit the key pathways like the epithelialmesenchymal transition (EMT) by which epithelial cells lose their cell polarity and cell-cell adhesion, and gain migratory and invasive properties to become mesenchymal stem cells. Western blot experiments were done to study the inhibition of the NFÎ^oB signaling pathway which is involved extensively in cancer development and progression. To show the specificity of these peptides for MIEN1 protein, circular dichroism (CD) experiments were performed. Results Two peptides designed based on MIEN1 protein sequence showed inhibition of MDA-MB-231 breast cancer cell proliferation in the MTT assay. Wound healing and transwell invasion assays show that these peptides inhibited the migration and invasion of MDA-MB-231 cells in a dose-dependent manner. RT-PCR results showed that the key
molecules of epithelial-mesenchymal transition (EMT) were inhibited which can inhibit the migratory capacities of the cells. The nuclear translocation of p50 and p65 subunits of NFÎ^oB were also inhibited. The bio-active peptides attained a Î²-sheet structure in MIEN1 protein environment, in the circular dichroism (CD) experiments indicating the specific interaction with MIEN1 protein while the non-active peptides remained random coiled. Conclusions This work is the first report of the inhibitors designed for targeting MIEN1 protein. The peptides inhibitors were able to inhibit the key epithelial-to-mesenchymal transition transcription factors (EMT-TFs) like SNAIL, SLUG and TWIST1 which play a vital role in the metastatic process of breast cancer. Besides this the also downregulated nuclear factor-Î^oB (NF-Î^oB) activation. By inhibiting these two key processes aggressiveness and metastatic potential of MDA-MB-231 breast cancer cells were decreased.

One-Pot Synthesis of Novel 2-Imino-5-Arylidine-Thiazolidine Analogues and Evaluation of Their Anti-Proliferative Activity against MCF7 Breast Cancer Cell Line

Abstract ID: UNTHSC316 Research Area: Cancer Presenter: Amany Iskander Submission Type: Competition Poster Department: Non-UNTHSC Classification: HSC College of Pharmacy Student

Author(s):

- Amany Iskander
- Marian Aziz

Abstract:

An efficient surface-mediated synthetic method to facilitate access to a novel class of thiazolidines is described. The rationale behind the design of the targeted thiazolidines was to prepare stable thiazolidine analogues and evaluate their anti-proliferative activity against a breast cancer cell line (MCF7). Most of the synthesized analogues exhibited increased potency ranging from 2""15-fold higher compared to the standard reference, cisplatin. The most active thiazolidines contain a halogenated or electron withdrawing group attached to the N-phenyl ring of exocyclic 2-imino group. However, combination of the two substituents did not enhance the activity. The anti-proliferative activity was measured in terms of IC50 values using an MTT assay.

Norepinephrine innervation of the supraoptic nucleus contributes to dilutional hyponatremia in male BDL rats

Abstract ID: UNTHSC313 Research Area: Integrative Physiology Presenter: Ato Oppong Aikins Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Ato Aikins
- Joel Little
- Nataliya Rybalchenko
- Joseph Cunningham

Abstract:

Purpose: Dilutional hyponatremia is a common complication associated with liver cirrhosis that is linked to inappropriate release of arginine vasopressin (AVP). Elevated plasma AVP causes water retention and hypoosmolality. In the cirrhotic liver, there is increase in resistance to blood flow resulting in portal hypertension, ascites formation, mesenteric vasodilation due to release of vasodilators and increased pooling of blood in the splanchnic circulation. The fluid redistribution decreases central vascular blood volume which is sensed by peripheral baroreceptors and volume receptors located in the aortic arch and heart. This could be relayed to A1 neurons in the caudal ventrolateral medulla (CVLM) and the A2 neurons in the nucleus tractus solitarius (NTS). The A1/A2 neurons stimulate the release of AVP from the supraoptic nucleus (SON). We propose that the A1 and A2 norepinephrine neurons in the hindbrain contribute to the activation of AVP-secreting neurons in the supraoptic nucleus (SON) leading to inappropriate AVP release and dilutional hyponatremia. Method: Anti-DBH saporin [IT-03] (Advanced Targeting Systems), a cytotoxin conjugated to an antibody against DBH was injected to the SON to lesion the norepinephrine innervation of SON including A1/A2 neurons. After two weeks, adult male rats received bile duct ligation surgery (BDL) which was used to model liver cirrhosis. In this model, the common duct that drains bile from the liver to the intestine is cauterized between two ligatures leading to obstructive cholestasis and liver cirrhosis. Four weeks after BDL surgery, rats were anesthetized with inactin (thiobutabarbital sodium salt hydrate; 100 mg/kg, i.p.). Blood samples were taken for plasma copeptin, osmolality, and hematocrit measurements. The rats were then perfused transcardially with 1M phosphate-buffered saline (PBS) followed by 4% paraformaldehyde (4% PFA) in 1M PBS. Plasma copeptin concentration was measured as a surrogate marker for AVP using commercially available copeptin ELISA kits. The brains were removed and processed for delta FosB (a marker of chronic activation), dopamine \hat{I}^2 hydroxylase (DBH) and AVP immunohistochemistry. Results: Anti-DBH saporin (ADS)

injection in the SON of BDL rats significantly decreased the number of cells positive for both delta FosB and DBH in the A1 and A2 cell groups as compared to vehicle injection (A1 neurons, ADS/BDL vs Vehicle/BDL P< 0.001; A2 neurons, ADS/BDL vs Vehicle/BDL P< 0.05). ADS treated BDL rats had fewer SON cells positive for both AVP and delta FosB as compared to vehicle injection (ADS/BDL vs Vehicle/BDL P< 0.05). Reduced colocalization of delta FosB and DBH in A1/A2 neurons was associated with a significantly lower plasma copeptin concentration in BDL rats. (ADS/BDL vs Vehicle/BDL P< 0.05). Similar effects were seen for plasma osmolality and hematocrit (ADS/BDL vs Vehicle/BDL P< 0.05). Conclusion: The result suggests that an increase in cells positive for both delta FosB and DBH in A1/A2 neurons is associated with an increase in plasma AVP and hypoosmolality in male BDL rats. Anti-DBH saporin lesions of SON prevented increases in plasma copeptin and neural activation of A1/A2 and AVP SON neurons associated with BDL.

Examining Disparities in the Use of Electronic Vapor Products (EVPs) among the US Youths

Abstract ID: UNTHSC311 Research Area: Health Disparities Presenter: Smriti Dhakal Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Smriti Dhakal
- Erika Thompson

Abstract:

Background: Electronic vapor products (EVPs) use is more common than cigarette smoking among US youths. EVPs may contain nicotine which is highly addictive, and the aerosol generated has carcinogens and toxic chemicals. Although public health efforts to reduce EVP use are in place, some demographic groups continue to experience a higher burden. In particular, sexual minorities are exposed to targeted marketing strategies and normative influence in social networks which puts them at increased risk. However, little is known about the prevalence of EVPs among sexual minority youths living in the US. This study aims to (1) identify sociodemographic characteristics associated with the use of EVP among US youths and (2) determine if EVP use disparities exist among sexual minorities. Methods: The 2019 Youth Risk Behavior Surveillance (YRBS) data for the entire US were used to assess demographic correlates of EVP use among high school students. The study sample was a nationally representative sample of students in grades $9^{11}2$ (n=13677). The CDC's YRBS data portal was used for analysis. T-test was used to identify statistical significance among variables and the level of significance was p < .05. Results: About 50.1% of US youths reported ever using EVPs. Non-Hispanic Black (p-value < .001), Hispanic/Latino (pvalue < .001), and Asians (p-value < .001) were significantly less likely to ever use EVPs as compared to Non-Hispanic White students. More than half (56.0%) of students who identified as sexual minorities (gay/lesbian/bisexual students) reported ever using EVPs and sexual minorities were significantly more likely to have ever used EVPs as compared to heterosexual individuals (p-value < .001). Further, 71.4% of the students whose sexual contacts were same-sex only or both sexes reported ever using EVPs. Conclusion: The use of electronic vapor products is significantly high among Non-Hispanic White students and sexual minorities. This finding highlights the existence of disparities in EVP use and warrants the need for developing evidence-based strategies focusing on high-risk groups. Tailored efforts that can reach sexual minorities, combined with regulatory efforts from FDA, should be launched to reduce EVP use. Future research should focus on the factors influencing EVP use among sexual minorities such that specific areas could be targeted.

Reducing Time-to-Antibiotics in Pediatric Oncology Patients Presenting to the Emergency Department with Fever

Abstract ID: UNTHSC310 Research Area: Pediatrics & Women's Health Presenter: Callie Frank Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Callie Frank
- Samuel Selby
- Tyler Hamby
- Geetha Devdas
- Jonathan Marr
- Audra McCreight
- Geeth Gandhi
- Porter Moore
- Hannah Smitherman
- Stephanie Lavin
- Gabby Chavez

Abstract:

Febrile neutropenia is a life-threatening oncologic emergency as it increases patient risk of serious illness and may mask symptoms of infection including sepsis. Time-to-antibiotics (TTA) is a commonly used measure to set the standard of care for pediatric cancer patients at risk of septic shock with a goal of less than 60 minutes. In order to improve TTA, this quality improvement initiative within Cook Children's Medical Center (CCMC) emergency department (ED) included two interventions: education of ED providers on sepsis protocols and a best practice advisory (BPA) through the electronic medical record system, Epic, which notifies the attending physician of oncology patients presenting with fever and prompts the physician to begin the order for antibiotics. Pediatric oncology patients presenting to CCMC ED with fever and neutropenia between 4/1/2020 and 2/28/2021 were retrospectively examined. Three groups were compared in TTA: baseline (4/1/2020-7/21/2020), intervention #1 (education; 7/22/2020-10/4/2020), and intervention #2 (BPA; 10/5/2020-2/28/2021). The groups were compared using analysis of variance with a Bonferroni correction for multiple comparisons. The average TTA significantly decreased from 98.75 minutes in baseline to 69.12 minutes in intervention #2 (p< 0.01). The months of October 2020 and February 2021 reached the goal of TTA < 60 minutes with

average times of 57.5 minutes and 58.14 minutes, respectively. The combination of education and BPA interventions effectively reduced TTA for febrile neutropenic patients in the ED.

Case Report Choroidal Metastasis secondary to Lung Malignancy

Abstract ID: UNTHSC308 Research Area: Eye / Vision Presenter: Alex Tolman Submission Type: Competition Poster Department: North Texas Eye Research Institute Classification: TCU/UNTHSC School of Medicine

Author(s):

- Alex Tolman
- Ramyashree Nyalakonda
- Johnathan Warminski
- Sima Mozdbar

Abstract:

Background: Ocular malignancies are uncommon and often occur as secondary metastases. Due to the rarity of developing ocular metastases, special attention should be placed on history gathering and physical examination of a patient presenting with painless vision loss. Metastases are commonly observed in the posterior pole due to the rich microvasculature. Secondary metastases show a smoother morphology whereas primary ocular metastases may have a shaggy appearance. External beam radiation therapy, the most available treatment modality, is the conventional method for treating choroidal metastases due to preservation of vision and low occurrence of acute complications. Stereotactic radiosurgery, brachytherapy plaque insertion, and proton beam therapy are less common alternatives to external radiation treatment due to limited research and availability. Case Presentation: A 62-year-old Caucasian male with recently diagnosed primary lung adenocarcinoma 2 months prior was referred by his primary care physician and oncologist for ophthalmic evaluation before initiation of chemotherapy. The patient presented with a chief complaint of sudden, painless vision loss in the right eye. His symptoms started two weeks prior and had remained constant since onset. The patient reported that he had difficulty with both far and near vision. He denied recent fever or illness, trauma, severe or unusual headaches, double vision, jaw pain, scalp tenderness, or neurological impairment (e.g., dizziness, numbness, and tingling). The patient reported no improvement in vision with his bifocal lenses. Other medical history included prostate cancer status post resection followed by radiation, chronic obstructive pulmonary disease, polysubstance abuse, and ongoing tobacco use. The patient's ocular history included previous traumatic injury to his left eye during childhood, which resulted in a total retinal detachment and subsequent vision loss. Family medical and ocular histories were unremarkable. Snellen visual acuity was best corrected to 20/250 in his right eye. Best-corrected visual acuity in his left eye was counting fingers at 3 feet, secondary to his traumatic injury. His extraocular motilities were full and

he denied pain or diplopia with gaze change. Pupil examination revealed sluggish responses in both the right and left pupils. Goldmann tonometry revealed intraocular pressures of 12mmHg in the right eye and 18mmHg in the left eye. Slit lamp examination was unremarkable in both eyes. Dilated fundus examination revealed an elevated, smooth yellow-white lesion superior to the macula and significant vascular tortuosity in the right eye. The left eye revealed mild tortuosity, and diffuse scarring secondary to a longstanding retinal detachment. Optical coherence tomography (OCT) imaging was performed over the retinal lesion in the right eye and revealed significant subretinal fluid (Figure 2). The assessment at this time was bilateral hypertensive retinopathy and presumed malignant neoplasm of the right choroid consistent with metastatic lung cancer. The patient was referred to a retinal specialist for additional testing and treatment the same day. External beam radiation therapy was offered for palliation but rapid disease progression hindered treatment. Conclusion: This case highlights a rare complication of malignancy, emphasizing the importance of comprehensive history gathering and physical examination.

Association between sociodemographic and knowledge, attitude, and behavioral factors and Pap test; Health Information National Trends Survey 2020.

Abstract ID: UNTHSC306 Research Area: Health Disparities Presenter: PRIYANKA BASU Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Priyanka Basu
- Stacey Griner

Abstract:

Purpose In the past two decades, cervical cancer cases have decreased in the U.S., largely attributed to the secondary prevention by Papanicolaou (Pap) test to detect alterations in cervical cytology. However, racial and ethnic minority women are underscreened and report higher incidence and mortality from cervical cancer. Updated (2018) screening guidelines recommended Pap testing every 3 years for women ages 21-29 years and Pap testing every 3 years, or co-testing with HPV every 5 years, or HPV testing every 5 years for 30-65 years age group. Lack of knowledge regarding risk factors and negative attitudes towards cancerpreventive behaviors may affect adherence to screening recommendations, but research is limited. This study examines the association of sociodemographic and knowledge, attitude, and behavioral factors with adherence to Pap testing among a nationally representative sample of U.S. women. Methods The cross-sectional study was conducted using the 2020 Health Information National Trends Survey (HINTS 5, Cycle 4; n=1,089 women of screening age, 21-65 years). The outcome variable, adherence to cervical cancer screening recommendations were dichotomized into Pap testing within the last 3 years (adherent) or Pap test beyond 3 years/no Pap testing (non-adherent). Questions representing sociodemographic features and knowledge, attitudes, and behavioral measures were selected. Survey-weighted adjusted multivariable logistic regression models were used to assess the association of the sociodemographic and knowledge, attitude, and behavioral factors with Pap testing. Variables associated with Pap test adherence in the regression models were stratified into racial/ethnic groups. Results Approximately 79.3% of women reported being guideline adherent. Most of the sample were Non-Hispanic White women (63.1%), with 61.7% reporting Pap testing guideline adherence. 15.09% of Hispanic women and 14.1% of African American women reported Pap tests within the last 3 years. Compared to women up to high school education, college graduate/post-graduate women (aOR=1.95, 95%CI 1.01-3.79) had higher odds of being guideline adherent. Women with health insurance had higher odds of guideline adherence (aOR=3.60, 95%CI 1.49-8.73), compared

to those uninsured. Compared to those with lower knowledge, those with higher knowledge of HPV (aOR=2.41, 95%CI 1.31-4.43) showed higher odds of guideline adherent Pap testing. Non-Hispanic White women with college/post-graduate degree (aOR=3.06, 95%CI 1.27-7.38) and health insurance (aOR=5.26, 95%CI 1.43-19.30) were more likely to be guideline adherent than those with up to high school education and no insurance. The odds of receiving guideline adherent Pap testing are higher for those non-Hispanic White women with knowledge of HPV (aOR=2.98, 95%CI 1.59-5.57) as compared to those who are unaware of it. Conclusion With changes in recommendation guidelines, lack of higher education, lack of health insurance, and lower HPV knowledge may be factors associated with the underscreening of racial and ethnic minority women. Future studies focusing on the HPV and Pap testing knowledge, attitudes, and behaviors of women by race and ethnicity will help to identify and address culture-specific barriers related to Pap testing and ultimately reduce racial disparities in cervical cancer incidence and deaths.

A case presenting the obstacles to accurate diagnosis of pediatric mental health disorders

Abstract ID: UNTHSC305 Research Area: Pediatrics & Women's Health Presenter: Nur-Alhuda Shahub Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (4th Year)

Author(s):

- Nur-Alhuda Shahub
- Fariya Fatima
- Raheela Hafeez

Abstract:

Background: The diagnosis of psychiatric disorders in children presents unique obstacles, including parental perceptions of mental health disorders, failure of providers to address behavioral concerns, and limited report of symptoms due to limited history from child and caregivers. The most common mental health disorder diagnosed in children in the United States is ADHD, with the CDC estimating the national prevalence is 6.1 million in those aged 2-17 years. The importance of accurately diagnosing a mental health disorder can greatly impact a child's outcomes, including access to resources. Case information: A 9-year old African-American male presented for a follow up visit for ADHD at an outpatient clinic. Past medical history included ADD/ADHD, intellectual disability, and asthma. The patient had been diagnosed with ADHD combined type, with initial testing being performed at the office of a primary care provider five years previously. ADHD medication had been trialed with no improvement of symptoms. In addition, patient's symptoms (including hyperactivity, excessive verbal repetition, and difficulty concentrating) had been prevalent at home, but had not been demonstrated at school. Family history included paternal intellectual disability. Physical examination, focused on neurological exam, revealed no abnormalities. Despite the previous diagnosis of ADD/ADHD, the case warranted further workup due to presence of symptoms in only one setting, and co-diagnosis of intellectual disability. The patient was referred for further psychological testing in order to ensure that the correct diagnosis is made, and was connected to community resources. Conclusion: This case illustrates the unique presentation of mental health disorders in children, and the obstacles to appropriate diagnosis and treatment. This case also illustrates the importance of appropriately diagnosing mental health disorders when there are multiple diagnoses; despite the diagnosis of ASD and intellectual disability, it is possible the patient may have an entirely different disorder, such as Autism Spectrum Disorder, and full psychological evaluation is warranted.

Investigating the role of interleukin 1 alpha during Listeria monocytogenes infection

Abstract ID: UNTHSC303 Research Area: Immunology Presenter: Andrew Kim Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Andrew Kim
- Rance Berg

Abstract:

Purpose: Listeria monocytogenes (LM) causes listeriosis, one of the leading causes of death by foodborne illness in the United States. Although generally self-limiting in immunocompetent people, listeriosis can cause meningitis or sepsis in immunocompromised people and spontaneous abortion in pregnant women. Our interest in interleukin 1 alpha $(IL-1\hat{I}\pm)$, a cytokine historically associated with inflammation and alarmin activity, stemmed from a previous study in our lab showing that mice produced IL- $1\hat{I}$ + when infected with LM. Currently, the role of $IL-1\hat{I}\pm$ during infection is largely unexplored. Elucidating the role of IL- $1\hat{I}$ + during LM infection will determine if IL- $1\hat{I}$ + can potentially be used as a therapeutic agent and will expand our understanding of this cytokine. Method: Enzyme-linked immunosorbent assay (ELISA) was used to measure $IL-1\hat{I} \pm$ production by LM infected RAW 264.7 macrophages. Dose response and kinetic experiments were performed to optimize culture conditions. RAW 264.7 macrophages were then infected with LM and the impact of recombinant mouse IL-1 \hat{I} +, recombinant interleukin 1 beta (IL-1 \hat{I} ²), recombinant interferon-gamma (IFN- \hat{I}^3), neutralization of IL- $1\hat{I}\pm$, or blockade of the interleukin 1 receptor (IL-1R1) on bacterial burden was determined. Macrophage viability was measured using trypan blue to determine if the culture conditions severely impacted cell viability and to correlate viability with cytokine production and specific treatments. The total LM burden in the cultures was quantified to determine the impact of specific treatments on the ability of macrophages to kill LM. Results: $IL-1\hat{I}\pm$ production was significantly increased in LM infected RAW 264.7 macrophage cultures compared to uninfected control cultures. The production of $IL-1\hat{I}$ by RAW 264.7 macrophages increased, plateaued, and then decreased at 6, 12, 18, and 24 hours post LM infection. We determined that infecting 500,000 macrophages at a multiplicity of infection of 1 resulted in significant IL-1 \hat{I} + production while maintaining adequate macrophage viability. These culture conditions were then used for our bacterial burden studies. Bacterial burden decreased in LM infected cultures with recombinant IL-1 $\hat{1}$ + at 18 hours compared to untreated cultures, but not significantly. Conclusion: Our data suggest that macrophages may contribute significantly to $IL-1\hat{I} \pm$

production during LM infection. Furthermore, recombinant IL-1α may have the potential to activate macrophages, resulting in enhanced LM killing. The reduction in bacterial burden in macrophages treated with recombinant IL-1α was similar to the reduction in bacterial burden in IFN-Î³ treated macrophage cultures. Therefore, our data suggest that recombinant IL-1α may contribute to LM resistance. Future experiments include observation of bacterial burden after addition of recombinant IL-1Î², neutralization of IL-1α and blockade of IL-1R1 in LM infected macrophage cultures. LM targets the liver, so we will also investigate the impact of recombinant IL-1α on LM infected Hepa 1-6 hepatocytes and cocultures of RAW 264.7 macrophages and Hepa 1-6 hepatocytes.

Evaluating cardiovascular disease risk among African Americans in the Fruit and Veggies for Health Study

Abstract ID: UNTHSC301 Research Area: Community Medicine Presenter: Jil Shah Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Jil Shah
- Mahbuba Khan
- Leilani Dodgen
- Heather Kitzman

Abstract:

Purpose: Cardiovascular disease (CVD) is the leading cause of death and disability worldwide. Elevated blood pressure, blood glucose, cholesterol, and low high-density lipoprotein (HDL) are well-accepted markers of CVD risk. The prevalence of CVD in the US is expected to rise 10% by 2030 attributed to a dramatic rise in obesity, blood pressure, and diabetes. African Americans are at a greater risk for CVD incidence and progression. Fruit and vegetable (F&V) consumption is considered to be protective against CVD. The Fruit and Veggies for Health study conducted at Baylor Scott & White Health and Wellness Center, Dallas, was a randomized trial that prospectively compared changes in markers of chronic kidney disease (CKD) in African Americans randomized to either receiving a weekly supply of F&V or to a cooking class plus a weekly supply of F&V. This project aims to evaluate the effect of the intervention on the secondary outcomes of the study related to CVD namely blood pressure, blood glucose, and cholesterol. In addition, differential rates of change across intervention groups may be explored. Methods: African American adults identified to have an increased risk of CKD by urine dipstick (n=142) were randomized to either receiving weekly F&V for 6 weeks with cooking class (n=70) or weekly F&V only (n=72). Both groups received 18 weeks of farm stand vouchers to continue getting F&V after the 6 weeks of prepackaged F&V. Blood pressure, fasting blood glucose, HbA1c, cholesterol (total, HDL, LDL, TRG), and body-mass-index were measured at baseline, 6-weeks, and 6-months. Descriptive statistics for demographic variables and metabolic markers at baseline were performed using chi-square tests and t-tests. Changes in secondary outcome measures between two measurement times, overall and by group, were analyzed using paired t-tests. Mixed-effects models, adjusted for age, gender, education, and income were conducted with a per-protocol analysis to evaluate the changes in each outcome over the three measurement times. Multiple imputation methods were used to avoid bias due to list-wise deletion. All analyses were performed using SAS version 9.4 with a 0.05 level of

significance. Results: Participants' mean age was 57 years (SD=11.8); (22.5% Male, 77.5% Female). The distribution of age, gender, marital status, and income was similar across both groups. Mean HbA1c among all participants decreased significantly by 0.2% (SD=0.5, p-value< 0.0001) from baseline to 6-weeks, and by 0.2% (SD=0.6, p-value< 0.0001) from baseline to 6-months. Mean HDL increased significantly by 2.2 mg/dL (SD=9.3, p-value=0.005) from baseline to 6-months and by 3.9 mg/dL (SD=10, p-value< 0.0001) from 6-weeks to 6-months among all participants. The analysis is ongoing and complete results by intervention group will be ready for the presentation. Conclusion: Interventions that provide access to F&V and assist in skills to increase F&V intake by African Americans are needed, and may significantly help in lowering markers of CVD risk. Intervening in early stages might help reduce CVD incidence, its progression to advanced stages, and associated mortality.

Environmental Pesticide Exposure and Cognition Among Adults 60 Years and Older in the United States

Abstract ID: UNTHSC299 Research Area: Aging / Alzheimer Presenter: Jolie Starling Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Jolie Starling
- Jialiang Liu
- Menghua Tao

Abstract:

Purpose: Cognitive decline is an increasingly important public health issue among elderly adults that can lead to loss of memory, decreased ability to function, and numerous other health burdens. Pesticides are commonly manufactured and distributed chemicals that are frequently used for occupational farming and within households. Pesticide exposure has been examined as a possible risk factor for cognitive decline in the past; however, a complete understanding of this relationship remains unclear. This study examined the association between pesticide exposure and cognition, taking into consideration the potential influence of lifestyle factors and comorbidities. Methods: Based on the nationally representative, 2011 - 2014 National Health and Nutrition Examination Survey (NHANES), the study included 733 participants aged greater than or equal to 60 years who completed cognition tests and had available data on urinary concentrations of six pyrethroid, herbicide, and organophosphate pesticide metabolites. Linear regression models were applied to examine the associations between pesticide exposure and cognition, measured by global cognitive z-score. Results: After adjusting for demographic and other confounding factors, a higher level of para-Nitrophenol was marginally associated with lower global cognitive zscore ($\hat{I}^2 = -0.0761$, 95% CI [-0.24, 0.09], highest vs. lowest tertile); however, the association was not statistically significant. When stratified, the association of 4-fluoro-3phenoxy-benzoic acid with lower global cognition score was primarily observed among former smokers in the 0-50% detectable level ($\hat{I}^2 = -0.3633, 95\%$ CI [-0.68, -0.04]) and among the participants with a poverty income ratio (PIR) < 1.85 in both the 0-50% ($\hat{I}^2 = -$ 0.6678, 95% CI [-1.25, -0.09]) and 50-100% detectable levels (\hat{I}^2 = -0.3196, 95% CI [-0.62, -0.02]). The interactions with smoking and PIR status were statistically significant (p < 0.05). Among females, a higher level of para-Nitrophenol and both the 0-50% and 50-100% detectable levels of 4-fluoro-3-phenoxy-benzoic acid were marginally associated with lower global cognition; however, neither of these associations were statistically significant. There were no clear associations for global cognition with other pesticide metabolites.

Conclusions: Our findings suggest that higher para-Nitrophenol exposure may associate with poor cognitive function in older adults. 4-fluoro-3-phenoxy-benzoic acid may impair cognition among former smokers and those with a PIR < 1.85. Future studies are needed to confirm the findings and to further understand mechanisms between pesticide exposure and cognitive decline.

Coronavirus Disease 2019 Pandemic Associated with Depression among Non-Hispanic Whites with Chronic Conditions in the United States

Abstract ID: UNTHSC298 Research Area: Other Presenter: Jenny Paul Submission Type: Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Jenny Paul
- Hao Wang
- Ivana Ye

Abstract:

Purpose: During the coronavirus 2019 (COVID-19) pandemic, increased depression was reported, with mixed findings among individuals of different races and ethnicities. This study examines whether depression increased during the COVID-19 pandemic compared to the pre-COVD-19 period among different racial and ethnic groups in the United States. Methods: A cross-sectional analysis of secondary data from the National Cancer Institute's Health Information National Trend Surveys 5 (HINTS 5) Cycle 4 was conducted. Survey responses were separated into two groups based on date of response; a pre-COVID-19 cohort (before March 11, 2020, weighted N = 77,501,549) and a COVID-19 cohort (on and after March 11, 2020, weighted N = 37,222,019). The Patient Health Questionnaire (PHQ) was used to measure depression and results were further compared before and during COVID-19. Separate multivariable logistic regression analyses were used to determine the association of the COVID-19 pandemic depression after adjusting for age, sex, insurance, income, and education. Results: A higher percentage of Non-Hispanic Whites (NHW) with chronic conditions reported depression (20.7% vs. 9.3%, p=0.0034) during COVID-19 than pre-COVID-19. The adjusted odds ratio (AOR) of depression for NHWs with chronic conditions during the COVID-19 pandemic was 2.33 (1.17-4.65, p=0.018) compared to NHWs who participated in the survey before the COVID-19. Conclusions: The COVID-19 pandemic was associated with an increased prevalence of depression among NHW adults with chronic conditions, but not among people of color.

Identification of Potential Positive Allosteric Modulators of Sigma-1 Receptor using Computational Molecular Docking and Virtual Screening

Abstract ID: UNTHSC296 Research Area: Pharmaceutical Sciences Presenter: Zachary Gunnar Olson Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Zachary Olson
- Pratibha Kumari
- Jin Liu

Abstract:

Purpose: Coronaviruses (such as SARS-COV-2) can achieve replication in host cells by activating pathways in the endoplasmic reticulum (ER), which causes ER stress. As it is known that the mortality rate of elderly populations in COVID-19 infection is dramatically high, indicating a vital role in the timely response of cell stress response signaling pathways in the management of the treatment of COVID-19. The sigma-1 receptor (Sig1R) is an important upstream modulator of ER stress, which regulates folding/degradation of proteins, Ca+2 homeostasis, ER stress responses, and cellular survival. Therefore, ligands enhancing Sig1R activities may improve the treatment of COVID-19 of the elderly patients. Positive Allosteric Modulators (PAM) can enhance protein activities by binding at an allosteric site. Several PAMs of Sig1R have been reported. However, the molecular basis of interactions of PAMs in Sig1R is poorly understood. Further, we do not have much information about the allosteric binding sites in Sig1R yet. Our purpose in this research is to identify possible chemical scaffolds/compounds that can bind at the allosteric sites of Sig1R and selectively elicit the activity of Sig1R. Method: In this study, we have assessed several known PAMs of Sig1R to investigate their binding affinity, the molecular basis of their interactions at three possible allosteric binding sites in Sig1R using the efficient docking suite, Glide. In addition to this, we explored ZINC and DRUG bank databases to search for compounds/chemical scaffolds that are similar to PAMs, which can be docked and engineered further to get a highly efficient drug target/PAM of Sig1R. Results: We have found that methylphenylpiracetam, SKF38393, and SCH23390 show high affinity for allosteric pockets. Further, by virtual screening of small drug-like compounds of the ZINC database in Auto Dock Vina, we obtained a list of 1000 compounds for each allosteric pocket of Sig1R. In the next step, we plan to continually refine our search by performing docking of these compounds and the compounds we obtained through ligand-based search in Glide to identify the promising set of compounds that bind efficiently at an allosteric site in Sig1R.

Conclusion: Using molecular docking, we have found three compounds methylphenylpiracetam, SKF38393, and SCH23390 that bind to Sig1R at the allosteric pockets with high binding affinities and identified a list of 1000 compounds for each potential allosteric sites, shedding light on the further development of selective PAMs of Sig1R.

Role of BMI in predicting treatment response to standard dose intranasal esketamine

Abstract ID: UNTHSC295 Research Area: General Medicine Presenter: Dilan Shah Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Dilan Shah
- Andy Czysz

Abstract:

Purpose: The current work aims to determine the effects of BMI on the response and remission rates of patients treated with standard dosed intranasal esketamine after 8 treatments. Introduction: Major depressive disorder (MDD) is the most common psychiatric illness in the United States and presents with a significant economic, emotional, and healthcare burden. Treatment-resistant depression (TRD), a subset of MDD for which nearly 30% of patients meet criteria, is especially challenging to manage, with most current interventions proving largely unsuccessful at reaching long-term remission. While definitions can vary, failure of two oral antidepressants of adequate dose and duration is the most common definition of TRD. Recently intranasal esketamine was approved as the first mechanistically distinct medication for depression in over 50 years. Proposed mechanisms of esketamine's anti-depressive function include NMDA receptor antagonism and modulation of the mTOR signaling cascade to affect synaptogenesis. Functional imaging also demonstrates esketamine's effect on multiple brain regions, including the medial prefrontal, motor, cingulate, and somatosensory cortex regions as well as subcortical regions. Though there is limited research beyond the recently concluded phase 3 clinical trials, the data and anecdotal evidence thus far have been promising that esketamine can provide a real solution for patients with treatment-resistant depression. Previous studies have been conducted to determine the treatment response in patients with MDD who received weightbased intravenous ketamine. No work exists, to the author's knowledge, investigating how BMI affects the response to standard-dosed intranasal esketamine. Materials and Methods: This study is conducted as a retrospective chart review of more than 40 patients who received treatment with intranasal esketamine at the BL6 clinic at UT Southwestern medical center in Dallas, Texas. Inclusion criteria consisted of patients ages 18 and older, with a primary diagnosis of major depressive disorder with failure of two or more oral antidepressants in the current depressive episode and received intranasal esketamine treatment. All patients were treated with a 56mg starting dose of intranasal esketamine and received treatment at an escalated 86mg dose on a standardized 8-week schedule. Efficacy

of treatment was determined by collecting survey data of indexes of depression and suicidality that are integrated into each patient's EPIC Flowsheet. These include the Patient Health Questionnaire (PHQ-9), Quick Inventory of Depression Symptomology Clinical Rating/Self Reporting (QIDS-SR/C), and the Clinical Global Impressions Scale (CGI). Patients were then stratified by body mass index and differences in response to esketamine treatment were delineated. Statistical analyses are underway. Impact: The need to bring real effective treatment to patients suffering from treatment-resistant depression is needed now more than ever, as societal unrest and hardship continue to exacerbate the mental health pandemic. Innovation in care is needed to meet demand and bring more patients to long-term remission. As new treatment options like intranasal esketamine surface, further investigation into the confounding factors of treatment is needed.

Outcomes from Team-based Comprehensive Assessment in a Geriatric Clinic

Abstract ID: UNTHSC294 Research Area: Health Disparities Presenter: Johny Morkos Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (2nd Year)

Author(s):

• Johny Morkos

Abstract:

Purpose: Comprehensive geriatric assessment (CGA) is a pivotal evaluation in an ambulatory setting because it can allow physicians to identify early issues that can alter a patient's quality of life. Nonetheless, CGA evaluations can be inconsistent due to the workflow in a primary care setting, especially where the majority of patients have a language barrier. The aim of this project was to examine the outcomes of a collaborative geriatric assessment intervention implemented at the HSC Health Center for Older Adults geriatric clinic from January 2021 to May 2021, particularly for the Spanish-speaking population. Methods: A geriatric primary care clinic collaborated with an Area Agency on Aging (AAA), a governmental organization that coordinates community services, to provide an intervention for Spanish-speaking older adult patients visiting the clinic either as a new patient or for their Annual Wellness Visit (AWVs). Patients are seen by a Spanish-fluent AAA social service coordinator who administered the comprehensive geriatric assessment in the patients' first language. The comprehensive assessment included an evaluation of the patient cognitive function using the Montreal Cognitive Assessment (MoCA), a geriatric depression scale (GDS), and discussion and review of advanced care planning documents. Additionally, the social service coordinator assessed their activities of daily living (ADLs) as well as instrumental activities of daily living (IADLs). Using a retrospective chart review of the electronic medical record (EMR), we examined patient demographics, clinical characteristics, community-based service referrals, and screenings completed over a sixmonth period during which the intervention was implemented. Results: Most of the participants (n=41) were Hispanic females between the ages of 70 to 79. Thirty percent (30%) reported elementary school level or no formal education, but 53% did not report their educational attainment. A majority (70%) of the patients lived with family such as a spouse or child, and 43% were married. Additionally, 83% of patients had a geriatric depression screening score in the normal range. Almost half of the participants received a MoCA score of less than 19, which indicates moderate cognitive impairment. Lastly, 70% of the patients reported that they have not completed their advanced care planning. About 10% of the patients were able to enroll with the Area Agency on Aging and received

services based on their needs, including but not limited to personal assistance, respite care, and durable medical equipment (DME) services. The remainder of the patients were either ineligible or did not follow up with the referral information provided at the clinic visit. Conclusion: Although only a few patients were able to benefit from enrollment with AAA, the partnership was instrumental in improving the utilization of screenings to help primary care providers identify the needs of older adult patients, especially in the Spanish-speaking population, as this was one of the challenges that healthcare providers faced. These results show that primary care and community partnerships have the potential to enhance geriatric assessments and improve education and awareness of resources for patients from underserved populations. Impact of PINK1 knockout on expression and phosphorylation of mitochondrial proteins and dopamine regulation: insight into early-stage Parkinson's Disease in the rat model.

Abstract ID: UNTHSC292 Research Area: Neuroscience Presenter: Joshia John Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: TCOM DO Student (2nd Year)

Author(s):

- Joshia John
- Michael Salvatore

Abstract:

Purpose: Mutations in the gene for PINK1, a mitochondrial protein, causes recessively inherited young-onset Parkinson's Disease (PD). This first report indicated the mutation when mapped to the PARK6 locus in a Spanish family. To model the impact of the PINK1 mutation, a rat model has been developed, but ambiguous results on dopamine regulation and motor function have been reported early in the lifespan. Here we investigated the impact of this mutation on Parkin, a mitochondrial protein that functions with PINK1 in mitophagy and dopamine regulation in early development. We hypothesized that compensatory changes in Parkin expression or its phosphorylation would occur, coinciding with changes in dopamine regulation due to the loss in expression or function of PINK1. Methods: In five-month-old PINK1 KO and age-matched wild-type (WT) rats, we confirmed the genotype by PCR, indicating the 26-base pair deletion as shown in the human mutation. Protein expression of PINK1, Parkin, phosphorylated Parkin, and TOM-20 were evaluated in comparison with dopamine tissue content, dopamine turnover, and tyrosine hydroxylase expression using quantitative Western Blotting. Results: In the PINK1 KO, dopamine tissue content decreased 43% in the striatum and 26% in the substantia nigra as compared to wild-type rats, commensurate with increased dopamine turnover in both regions. Parkin, phosphorylated Parkin, and TOM-20 protein expression were not significantly different in the PINK1 KO rat. Conclusion: This study suggests that compensatory changes in Parkin expression or phosphorylation are not modified in the PINK1 KO rat, though there is increased dopamine turnover and loss in both regions. Our findings indicate that dopamine regulation is affected early in the lifespan of the PINK1 rat, which may portend the overt loss of dopamine that leads to the parkinsonian signs with increasing age. The five-monthold rats used in this study correlate to a human age of approximately 20 years. Given that individuals with the PINK1 knockout mutation begin seeing motor impairments around 34 years of age, targeting mitochondrial dysfunction prior to when symptoms arise could

diminish nigrostriatal dopamine loss and be a promising approach to the development of future treatment.

Presentation of a Rare Isolated Soft Tissue Nontuberculous Mycobacterial Infection with MRI Characterization

Abstract ID: UNTHSC291

Research Area: General Medicine Presenter: Benjamin Timmer Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Benjamin Timmer
- Arkoon Ali
- Steven Schultz

Abstract:

Background: Nontuberculous mycobacteria (NTM), also known as atypical or environmental mycobacteria, was first described in the early 20th century. Although these bacteria are related to Mycobacterium tuberculosis, they are a distinct group of mycobacteria. Like Mycobacterium tuberculosis, NTM most commonly affects the lungs, however extrapulmonary infections involving soft tissue, skin, and lymph nodes can also occur. These extra-pulmonary infections are rare and are primarily acquired secondary to skin breaks following trauma, minor surgeries and cosmetic procedures. Due to the rarity of NTM soft tissue infections the diagnosis is challenging and often delayed. Patients who develop NTM infections are typically immunocompromised, as the rate of clinical infection is significantly low. The incidence of skin and soft tissue infections (SSTI) by NTM however has increased threefold over a thirty-year period, which has attracted attention in the medical community. Case Presentation: A 78-year-old male pecan farmer presented with a left lateral knee mass that progressively worsened over a four-year period. He described the initial lesion as a small knot and denied any trauma or skin abrasions to the affected area prior to developing the nodule. The patient had no history of immunodeficiency and he denied pain, redness, or drainage of the nodule. He also denied fevers, chills, night sweats, chronic cough, or unintentional weight-loss. A T2 weighted axial MRI demonstrated a 5.3 x 7.4 cm well circumscribed, sharply marginated, and encapsulated perifascial soft tissue collection with mixed high and low signal that was mildly heterogeneous along the iliotibial fascial band. These imaging manifestations suggested either a soft tissue tumor or an infectious process. After failing conservative treatment with antibiotics, the patient was referred to an orthopedic surgeon for excision of the mass. An encapsulated cyst-like mass was excised circumferentially around the IT band and was sent to pathology. The gross specimen was described as a 3-cm diameter smooth walled cyst that was partially filled with soft material.

Cut sections revealed caseating granulomatous inflammation. Special stain was positive for acid-fast bacilli consistent with mycobacteria. The specimen was negative for atypia, neoplasm, fungi, or polarizable crystals. Cultures did not grow any organisms and the TB gold assay and T spot test were negative for tuberculosis. This left a nontuberculous mycobacterial soft tissue infection as the diagnosis of exclusion. Treatment for SSTI NTM includes a multi-drug antibiotic regimen for at least 6 months based on susceptibility testing. Surgical intervention is indicated if antibiotic treatment is not effective. For this patient, surgical resection was the definitive treatment. Conclusion: This case illustrates a unique presentation of a rare isolated chronic NTM soft tissue infection of the lateral knee in a patient with no known history of trauma or immunodeficiency. Knowledge and clinical suspicion of this pathogen along with MRI findings can aid in the accurate and timely diagnosis of NTM soft tissue infections.

Sex differences in cerebrovascular dysfunction and hypertension in offspring of hypertensive pregnant rats

Abstract ID: UNTHSC290 Research Area: Integrative Physiology Presenter: Jonna Smith Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Jonna Smith
- Madison Powell
- Whitney Cromartie
- Mark Cunningham
- Jeremy Duncan

Abstract:

PURPOSE: Offspring from preeclamptic women have a greater risk of hypertension and cerebrovascular dysfunction later in life. One of the major contributors of cerebrovascular dysfunction is impaired cerebral blood flow (CBF) autoregulation. In the USA, 1 in 25 pregnancies are preeclamptic. Preeclampsia, as defined as new-onset hypertension during pregnancy, is an inflammatory condition characterized by elevated interleukin 17 (IL-17), mitochondrial reactive oxygen species (mtROS), mitochondrial dysfunction (mt-Dys), and intrauterine growth restriction (IUGR). Preliminary work from our laboratory demonstrates that offspring from preeclamptic rats have sex differences. Males have hypertension and a greater impairment of CBF autoregulation, while females have no change in blood pressure with impaired CBF autoregulation. The exact mechanisms for the sex differences in cerebrovascular dysfunction and hypertension is unknown and is the focus of this study. We hypothesize that changes in cerebral mt-dys, cerebral mtROS, and circulating IL-17 contributes to the sex differences in hypertension and cerebrovascular dysfunction in male and female offspring from preeclamptic rats. METHODS: In this study, we compared male and female offspring from normal pregnant and preeclamptic Sprague Dawley rats. All offspring were divided into controls (CON) and IUGR by sex. Hypertensive male and nonhypertensive female offspring's with impaired CBF autoregulation were examined at 17 weeks of age for changes in cerebral mitochondrial electron transport chain (ETC) protein complexes, cerebral manganese superoxide dismutase (MnSOD), and circulating IL-17. RESULTS: Female CON (151±5% IU/Protein/male CON) and IUGR (149±8 %IU/Protein/male CON) offspring have increased MnSOD compared to CON (100±7 %IU/Protein/male CON) and IUGR ($122\hat{A}\pm4$ %IU/Protein/male CON) males (p< 0.05). No changes in female ETC protein complexes between IUGR and CON. Male IUGR have a decrease in complex II (71Å \pm 5 vs. 100Å \pm 8 %IU/Protein/male CON, p< 0.05) and V (57Å \pm 2 vs. 100±10 %IU/Protein/male CON, p< 0.05) ETC proteins, and elevated IL-17 (944±370 vs. 412±115 pg/mL, ns) compared to CON males. CONCLUSION: Male IUGR offspring have mt-Dys and elevated IL-17, which may contribute to hypertension and a greater impairment in CBF autoregulation. Female IUGR offspring may be protected due to an increase in mitochondrial antioxidants. In summary, studying the dimorphic sex differences in the mechanisms of hypertension and cerebrovascular dysfunction in offspring of preeclamptic women, may improve the offspring's risk of hypertension, cardiovascular disease, stroke, and cognitive dysfunction later in life.

Radiation Exposure: Medical Student Interest and Knowledge in Interventional Radiology After Exposure to a Model Procedure Clinic

Abstract ID: UNTHSC289 Research Area: Education Presenter: Rahul Vedantam Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Rahul Vedantam
- Joshua Baker
- Benjamin Timmer

Abstract:

i. Purpose To increase medical student awareness and interest in Interventional Radiology (IR) by providing a hands on procedure clinic which allowed students to operate a C-arm, flow model, and innovative IR equipment. ii. Materials and Methods Medical students at the Texas College of Osteopathic Medicine were invited to attend the clinic held in the university anatomy lab. With the help of the anatomy lab personnel, a local radiology technician, and an IR physician; we utilized a C-arm and flow model to simulate acquiring femoral vascular access, and performing catheter skills in navigating vasculature, stroke thrombectomy, and aneurysm coilings. We analyzed IR interest and understanding pre and post the skills lab using a voluntary 11 question 5-point Likert-scale questionnaire. Due to sample size limitations survey results were modified. Strongly disagree, disagree, and undecided were modified to "œno" while those who answered agree or strongly agree were modified to "œyes"□ for statistical analysis. iii. Results A total of 12 student's (OMS I - 9, OMS II - 2, OMS III - 1) completed the survey. Following the simulation the cohort of students felt more knowledgeable about the field of IR (33% vs. 75%, P = .041), more interested in pursuing a career in IR (8% vs. 58%, P = .009), better understood the procedures IR physicians perform (25% vs. 75%, P = .014), felt more confident about acquiring vascular access (8% vs. 58%, P = .009), and better understood the role of an IR physician in an interdisciplinary care team (8% vs. 33%, P = .182). iv. Conclusions Overall, the survey results showed that the IR procedure clinic improved student satisfaction following the simulation. Further, this study demonstrated the role of IR procedure clinics in boosting medical student awareness and interest in IR.

Laparoscopic Detorsion of the Adnexa in the Second Trimester of Pregnancy: a Case Report

Abstract ID: UNTHSC288 Research Area: Pediatrics & Women's Health Presenter: Shelby B E Wildish Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Shelby Wildish
- Kollier Hinkle

Abstract:

Background: Adnexal torsion refers to partial or complete rotation of an ovary and/or fallopian tube around its ligamentous support structures, resulting in limited blood flow to the adnexa. The diminished flow leads to tissue ischemia, causing pain and occasionally necrosis. Adnexal torsion is one of the most common gynecological surgical emergencies affecting females of all ages. Pregnancy is a known risk factor for adnexal torsion, especially in patients with a history of ovarian cysts. Objective: We present a case of ovarian torsion managed with laparoscopic surgery in the second trimester of pregnancy and review the outcomes of the surgery. Adnexal torsion is typically managed laparoscopically in a nonpregnant patient. The gravid abdomen poses unique challenges for the management of adnexal torsion with minimally invasive surgery. Case Report: A 21-year-old female, G3P1011, at 24 weeks gestation with a history of a right ovarian cyst presented with a 4hour duration of right lower abdominal pain, nausea and vomiting. A pelvic ultrasound showed a large right ovarian cyst with preserved blood flow to the right adnexa. Despite reassuring doppler flow, there was a high index of concern for adnexal torsion due to the presence of the ovarian cyst and clinical presentation of severe right lower quadrant pain. After confirming reassuring fetal status and no sign of preterm labor causing her pain, she underwent urgent laparoscopic surgery, which confirmed the presence of a right adnexal cyst torsion. The right ovary was detorsed and a right ovarian cystectomy was performed with the right ovary preserved. She was observed for threatened preterm labor after her surgery. The patient was discharged home the next day and eventually delivered a healthy male infant at term. Several points of interest are present in this case. First, the doppler flow was present for the ovarian artery. This is due to early compression of the veins and a large amount of pressure needed to completely stop the arterial flow. Therefore, presence of flow to the adnexa does not exclude torsion. The uterine fundus above the umbilicus often requires LUQ entrance for the case and attention is needed to avoid the uterus with trocars. Surgical visualization is typically affected due to the fundus reducing complete views of the adnexa, and "coport hopping" may be needed to complete the case safely.

Additionally, preterm delivery of a 24 week fetus is not ideal and tocolysis is occasionally needed to prevent preterm delivery after surgical intervention. Conclusion: Although rapid surgical intervention for ovarian torsion is key for favorable outcomes, any abdominal surgery during pregnancy carries risks to the patient and their unborn fetus. Thus, the choice of surgical technique necessitates accounting for these risks based on the presenting condition, the patient's gestational age and known medical history.

Offspring of hypertensive placental ischemia rats have hypertension and mitochondrial dysfunction during pregnancy

Abstract ID: UNTHSC286 Research Area: Pediatrics & Women's Health Presenter: Madison Powell Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Madison Powell
- Whitney Cromartie
- Jonna Smith
- Mark Cunningham

Abstract:

Purpose: Preeclampsia is a pregnancy complication commonly observed in the third trimester of pregnancy and is often characterized by hypertension, placental ischemia, and Intrauterine growth restriction (IUGR), also referred to as fetal growth restriction. The causes of IUGR vary but are associated with maternal hypertension and placenta abnormalities. Clinical studies show that IUGR daughters of women with preeclampsia have an increased risk of developing hypertensive pregnancies, such as preeclampsia. Common factors associated with the pathophysiology of preeclampsia are systemic and tissue mitochondrial dysfunction, endothelial cell dysfunction, inflammation, and oxidative stress. Previous studies from our laboratory show that pregnant IUGR rats, derived from our reduced uterine perfusion pressure preclinical rodent model of preeclampsia (RUPP), develop hypertension during their own pregnancies along with an increase in brain size and systemic oxidative stress. However, the role of end-organ mitochondrial dysfunction has not been explored and is the focus of this study. We hypothesize that brain, heart, and kidney mitochondrial dysfunction will be present in pregnant IUGR rats. Methods: To measure mitochondrial dysfunction in the brain, heart, and kidney tissue, we will perform western blots on manganese superoxide dismutase (MnSOD), a mitochondrial specific antioxidant, and mitochondrial electron transport chain (ETC) complexes I-V in both normal pregnant (CON) and IUGR pregnant rats. Results: MnSOD protein abundance was decreased in the brain of IUGR vs CON pregnant rats ($88\hat{A}\pm3$ vs $100\hat{A}\pm3$ % IU/Protein/CON, p= 0.05). No differences were observed in the heart and kidney of IUGR and CON pregnant rats. Brain mitochondrial complexes II (144±14 vs 100±5 % IU/Protein/CON, p< 0.05), III (119±7 vs $100\hat{A}\pm 2$ % IU/Protein/CON, p= 0.06), and V ($125\hat{A}\pm 3$ vs $100\hat{A}\pm 4$ % IU/Protein/CON, p< 0.01) were increased in IUGR vs CON pregnant rats, and no changes were observed in the heart. However, kidney mitochondrial complexes III (84±3 vs 100±0.3 %

IU/Protein/CON, p< 0.05) and V (87ű2 vs 100ű1 % IU/Protein/CON, p< 0.05) were decreased in IUGR vs CON pregnant rats. Conclusions: Pregnant IUGR rats have hypertension and renal mitochondrial dysfunction. The decreased amount of brain specific mitochondrial antioxidants in IUGR pregnant rats may contribute to elevated systemic and local oxidative stress. The increase in ETC mitochondrial proteins in brain may be a compensatory mechanism to increase mitochondrial function in the swelling brain. Furthermore, the increase in ETC function in the brain may also increase mitochondrial reactive oxygen species levels, which may not be able to be quenched due to the decrease in brain mitochondrial antioxidants. Nevertheless, the increase in brain mitochondrial ETC proteins warrants further investigation. In conclusion, rather or not the increase in end-organ mitochondrial dysfunction is a cause or consequence of hypertension in pregnant IUGR rats is unknown? Future studies will be designed to address this question.
Characterization of arterial pressure and carotid blood flow responses to pulsatile perfusion therapy in a rat model of hemorrhage

Abstract ID: UNTHSC285 Research Area: Cardiovascular Presenter: Nasrul Bhuiyan Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Nasrul Bhuiyan
- George Farmer
- Garen Anderson
- Kenneth Davis
- Joseph Cunningham
- Caroline Rickards

Abstract:

Introduction: In a human model of simulated blood loss, oscillatory patterns of arterial pressure and blood flow, or "œpulsatile perfusion", can protect cerebral and peripheral tissue oxygenation, and prolong tolerance to this stress. In this pilot study, we investigate whether pulsatile perfusion therapy can protect arterial pressure and cerebral blood flow in a rat model of actual blood loss. We hypothesized that pulsatile perfusion therapy (PPT), applied via repeated thigh cuff inflations, would attenuate the reduction in arterial pressure and cerebral blood flow following hemorrhage. Methods: Sprague Dawley rats underwent the following protocols: hemorrhage alone (control: N=4; 2 male, 2 female), or hemorrhage plus PPT (N=3; 1 male, 2 female). PPT was applied via rapid 1 s inflations and deflations of a thigh cuff (0.5 Hz). A catheter was inserted in the femoral artery for continuous measurement of arterial pressure, and a perivascular flow probe was placed around the common carotid artery (CCA) for measurement of blood flow. Following instrumentation, each animal completed a baseline period (15 min), followed by a \sim 55% hemorrhage (25 min), PPT or control (30 min), and a recovery period (155 min or until death). Results: Decreases in mean arterial pressure (MAP) and CCA blood flow were observed in response to hemorrhage ($P\hat{a}$ ‰×0.002). At the end of the PPT period, no differences were observed between the PPT and control groups for MAP (PPT: $46.7 \text{Å} \pm 27.3 \text{ mmHg vs. control}$: $30.2\hat{A} \pm 13.5 \text{ mmHg}$; P=0.44) or CCA peak blood flow (PPT: $2.7\hat{A} \pm 1.5 \text{ ml/min vs. control}$: 1.9ű1.3 ml/min; P=0.92). Similarly, no differences were observed in the relative change from baseline to the end of the PPT period for MAP (PPT: -45±38% vs. control: - $55\hat{A}\pm 14\%$; P=0.65) or CCA peak blood flow (PPT: -65 $\hat{A}\pm 21\%$ vs. control: -66 $\hat{A}\pm 12\%$; P=0.70). Conclusion: These results suggest that following a 55% hemorrhage in rats, PPT

did not protect arterial pressure or carotid blood flow. However, the sample size was low in this pilot study, resulting in high variability in the observed responses. Accordingly, additional experiments are needed with an increased sample size to accurately determine the potential beneficial effects of PPT following hemorrhage.

PKD1 Variants of Uncertain Significance Found in a 64 year-old Male With Simple Renal Cysts and Thoracic Aortic Disease

Abstract ID: UNTHSC284

Research Area: Cardiovascular Presenter: Suhas V.V. Tatapudi Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

• Suhas Tatapudi

Abstract:

Introduction: Thoracic aortic disease (TAD) - aneurysms and dissections, is a clinically silent disorder caused by weakening of major blood vessels which may lead to rupture and imminent mortality. Simple renal cysts are relatively common and are associated with numerous etiologies. Case presentation: Here we present the case of a 64 year-old male with a history of smoking, hypertension, and stroke due to cerebral aneurysm. He presented with substernal chest pain and was diagnosed with a type B aortic dissection extending from the left subclavian artery to the left iliac artery. An aortic endograft was placed to prevent rupture, covering the ostium of the left subclavian artery. Immediate post-operative bilateral lower extremity paraplegia developed, ultimately necessitating a subclavian artery bypass for resolution. Despite clinical improvement, two weeks post-operatively an aortic rupture occurred, leading to cardiac arrest and demise. Pathologic and Ancillary findings: Notable findings on autopsy included aortic dissection and rupture, left hemothorax, multicystic kidneys, and prior evidence of craniotomy. The dissection extended anterograde to left internal iliac artery and retrograde to the sinotubular junction with rupture just distal to the distal aspect of the endograft. No abnormalities were reported in aortopathy panels. Polycystic kidney disease panels revealed three variants of uncertain significance (VUS) within the PKD1 gene: p.Val2905Ile, p.Lys3232Glu, p.Leu3477Ile. Congophilic (amyloid) angiopathy was discovered within several vessels in the brain which may be associated with the history of a cerebral aneurysm. Discussion: Hypertension and smoking are significant risk factors for systemic vascular disease. While PKD1 and PKD2 mutations can be seen associated with autosomal dominant polycystic kidney disease, heterozygous mutations may result in milder cystic disease. Through retrospective case reports and series, Ziganshin et al proposed an association between simple renal cysts and TAD. As more evidence is established, a diagnosis of simple renal cysts may prompt the need for screening for TAD. Our clinical and molecular picture may further substantiate a potential relationship between TAD, cystic renal disease, and mutations in PKD1 and PKD2 genes. Furthermore, genetic counseling may also be necessary for surviving family members. This case exemplifies the

importance of postmortem autopsies and the discovery of genetic variants with potential clinical implication.

Postweaning Craniofacial Growth in the OIM Mouse Model of Osteogenesis Imperfecta

Abstract ID: UNTHSC282 Research Area: Structural Anatomy Presenter: Ashley T Steele Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Ashley Steele
- D. Rex Mitchell
- Jason Organ
- Rachel Menegaz

Abstract:

Osteogenesis imperfecta (OI) type III is a severe genetic disorder of type I collagen (Col1) resulting in bone fragility, reduced stature, and impaired craniofacial growth resulting in midface hypoplasia, dental malocclusions, and macrocephaly. While the adult OI murine (OIM) mouse model exhibits craniofacial phenotypes similar to patients with OI, little is known about the developmental trajectories of these phenotypes. To investigate the mechanisms by which Col1 mutations alter postnatal craniofacial growth, we analyzed the phenotype of the OIM mouse from the age of weaning until adulthood (skeletal maturity). OIM and wild-type (WT) littermates were scanned in-vivo with a Skyscan 1176 micro-CT system at 4 weeks (weaning) and 16 weeks (adulthood). 3D landmarks were collected using 3D Slicer software. Centroid size (a proxy for craniomandibular size) was compared using Mann-Whitney U tests. Morphological analysis for shape variation, including Generalized Procrustes analysis (GPA) and principal component analyses (PCA), were performed using the "œgeomorph" package in R. Procrustes ANOVAs were used to test for significant differences in craniomandibular shape between the genotypes. Morphological disparity was estimated as the Procrustes variance and statistically compared using the morphol.disparity function in R. Craniomandibular centroid sizes were significantly smaller in the OIM mice than the WT mice at both weeks 4 and 16 (p < 0.010). When the effects of size were accounted for by the GPA, significant shape differences were present (p < 0.002) throughout growth. For their size, both juvenile and adult OIM mice had shortened midfaces and increased cranial vault dimensions (relative macrocephaly) compared to WT littermates. Morphological differences were seen around the rostrum, temporal crests, and zygomatic arches. Marked vertical expansion of the neurocranium at the sagittal and coronal sutures presented with a concomitant basicranial shortening in the juvenile OIM mice only. Compared to WT, both juvenile and adult OIM mice had mandibles that were longitudinally shortened and mediolaterally wide. Morphological differences were seen around the incisal

ramus and angular process at both ages, and in the coronoid process of adult OIM mice. Significantly different (p=0.001) morphological disparity between the genotypes existed only at the juvenile stage, demonstrating an overall decrease in variance throughout postnatal development period. This suggests that mice with greater variances in cranial shape experienced higher rates of attrition. This is potentially related to increased craniofacial fracture rates seen in the OIM mice. These results suggest that while the OIM craniofacial phenotype differs significantly from the WT throughout postweaning growth, functional constraints (such as feeding performance) may limit the degree of potential phenotypic divergence. Furthermore, while previous work in human patients with OI has linked the development of macrocephaly to basicranial shortening during early skull development, our results provide limited support for this hypothesis due to the absence of basicranial changes in adult OIM mice. Future investigations will examine perinatal and preweaning growth in the OIM mouse model to better understand the development of these craniofacial dysmorphologies, and to identify optimal growth windows during which interventions might recover bone quality and growth trajectories in patients with OI.

Candidate gene analysis of 535 "pain genes" and associations with reported intensity of chronic low back pain

Abstract ID: UNTHSC281 Research Area: Physical Medicine / OMM Presenter: Christine A. Hurd Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Christine Hurd
- Nicole Phillips
- Emily Lin
- Dallen Broadbent
- Alexander Doederlein
- Vishnu Dubakula
- John Licciardone

Abstract:

Purpose: Numerous genome-wide association studies have been able to elucidate potential underlying genetic associations with clinical diagnoses. Chronic low back pain (CLBP) is a clinical presentation that has not yet been strongly associated with specific genetic markers. Several studies however have found genetic associations with other various pain disorders, such as the 535 genes identified by Ultsch et al. as "œpain genes." Our group aims to find associations between previously identified pain-related genes and clinical reports of the intensity of low back pain using genetic and clinical data collected by the PRECISION Pain Research Registry. Methods: The PRECISION Pain Research Registry is a national registry that has collected demographic, clinical, and genetic information of patients with CLBP. Our analysis is querying associations between these identified "capain genes" and the intensity of low back pain reported by registry participants using a numerical rating scale (NRS). Methods: Participants in the PRECISION Pain Research Registry were genotyped via an Illumina iScan Array Scanner and Global Screening Array. The phenotype of CLBP will be measured by the NRS, which is an 11-point quantifier of pain intensity. The collected genotypes and phenotypic expression of pain will be compared via the Multi-marker Analysis of GenoMic Annotation (MAGMA), which enables candidate gene analysis of the 535 "œpain genes" via congregation of single nucleotide polymorphisms (SNPs) and subsequent projection onto principal components in a matrix. Pain intensity will be evaluated as a function of genetic effects accounting for selected covariates"" comorbid conditions with a documented relationship to CLBP, smoking status, and genetic ancestry plus residuals, with F-tests to determine the p-values of associations. Results: FN1 and STARD13 were found to

be significantly associated with pain intensity in AA registry participants and VEGF-A was found to be significantly associated with widespread pain in NHW registry participants Conclusion: For treatment that is refractory to other strategies, targeted drugs for these protein products can be explored as treatments. These mentioned genes also have significant epigenetic regulation that could be explored in further studies.

Outpatient Intravenous Albumin Decreases Hospitalization and Mortality in Patients with Cirrhosis and Refractory Ascites or Anasarca

Abstract ID: UNTHSC211 Research Area: General Medicine Presenter: Miki Edwards Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Miki Edwards
- Stevan Gonzalez
- Manjushree Gautam
- Brooke Osborne
- Apurva Modi
- Mohammad Ashfaq
- Amy Huang
- Sumeet Asrani
- James Trotter

Abstract:

Purpose: Albumin improves survival and outcomes associated with complications of cirrhosis including spontaneous bacterial peritonitis (SBP), hepatorenal syndrome, and volume overload. The role of outpatient intravenous albumin infusions in decreasing hospitalizations and mortality in this population has not been well established. Methods: A retrospective electronic medical record review of cirrhotic patients with refractory ascites or anasarca who underwent outpatient intravenous albumin therapy between the years of 2011 and 2015 was performed. All patients received at least one albumin infusion of 25% albumin 50 g which was given independently from albumin received during paracenteses. Patients with transjugular intrahepatic portosystemic shunts (TIPS) were excluded. Laboratory, clinical data, and hospitalizations 3 months before initiation of albumin therapy and longitudinal follow up over 12 months were assessed, including hospitalizations, transplantation and overall survival. Results: 97 patients received at least one outpatient albumin infusion. Patient demographics included median age 62 (range 38-86), 64% male, 86% Caucasian, 36% cryptogenic/nonalcoholic fatty liver disease and 34% chronic hepatitis C. Median Model for End-Stage Liver Disease (MELD) score was 15 (6-29) with 24% MELD >20 and 51% of patients required hospitalizations within 3 months prior to initiation of albumin infusions. 18% of patients received a transplant by 12 months and 69% died during follow up. The median frequency of albumin infusions among patients was one infusion every 3 weeks and

40% received albumin infusions at least once every 2 weeks. Frequency of hospitalizations was decreased at 3 months (p=0.04), 6 months (p=0.04), and 12 months (p=0.08) among patients who had infusions at least every 2 weeks. Competing-risks regression was performed, demonstrating patients who received albumin infusions at least once every 2 weeks during the first 3 months had a lower cumulative incidence of death accounting for liver transplantation as a competing event (p=0.05), independent of sustained virologic response with chronic hepatitis C treatment and MELD score (p = 0.04). Conclusions: Outpatient intravenous albumin infusions decrease incidence of hospitalization and mortality in cirrhotic patients with refractory ascites or anasarca who are not candidates for TIPS placement.

Automated evaluation of p16 immunohistochemistry for diagnosis of cervical precancer

Abstract ID: UNTHSC209 Research Area: Cancer Presenter: Amy Tao Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (2nd Year)

Author(s):

- Amy Tao
- Nicolas Wentzensen
- Megan Clarke
- Teresa Darragh
- Felipe Miranda
- Niels Grabe
- Bernd Lahrmann

Abstract:

Purpose: Cervical cells transformed by high-risk strains of Human Papilloma Virus (HPV) overexpress the p16 protein, a cyclin-dependent kinase inhibitor that indicates activation of the E6 and E7 oncogenes. The Lower Anogenital Squamous Terminology (LAST) Standardization Project for HPV-Associated Lesions recommends the adjunctive use of p16 immunohistochemistry (IHC) in cervical biopsies to support diagnosis of Cervical Intraepithelial Neoplasia (CIN), which in some cases progresses to cervical cancer. However, evaluation of p16 expression is subjective. Development of automation that can quantify p16 expression in biopsies offers efficiency, accessibility, and objectivity in guiding clinicians in their management of women with suspected cancer precursors. We sought to evaluate the performance of artificial intelligence in assessing biopsies based on level of p16 expression. Methods: 251 biopsy specimens were collected from women with abnormal cervical cytology screening. These biopsies underwent p16 IHC and evaluation by a pathologist and were used to train and validate an initial deep-learning algorithm. After epithelial segmentation and p16 quantification, different thresholds of p16 expression were evaluated and correlated with disease status. Results: A threshold of 15 or more segments that demonstrate p16-staining in 70% or greater of the vertical extension of the epithelium produced a sensitivity of 82.26% and a specificity of 86.00% in identifying CIN2 or more pathogenic lesions. Conclusions: Current efforts are being made to further refine the algorithm and select the optimal threshold of p16 expression that correctly identifies CIN2+ biopsies. Artificial intelligence provides a reliable and promising avenue in the assessment of cervical biopsies, especially in low-resource settings where there is not ready access to pathologists and cervical cancer is a more prevalent phenomenon.

Bilaterally Absent Cephalic Veins: A Case Study

Abstract ID: UNTHSC208 Research Area: Structural Anatomy Presenter: Jacob Cronk Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

- Jacob Cronk
- Austin Fajkus
- Tina Do
- Cara Fisher

Abstract:

Background: The cephalic vein (CV) is one of the primary veins of the upper limb. It is a superficial vein located on the anterolateral surface of the arm and is a common site for venous access. The typical course begins along the radial aspect of the wrist and forearm where it joins with the median cubital vein (MCV) at the antecubital fossa and continues proximally through the superficial fascia, lateral to the biceps brachii muscle, and into the deltopectoral groove of the shoulder. It terminates by draining into the axillary vein in the deltopectoral triangle. The absence of the CV or variations in its location could have important implications for vascular procedures, such as Arteriovenous (AV) fistulas, which utilize the CV as the primary vein for preparing patients for long-term hemodialysis access. Case Information: An elderly Caucasian male cadaver presented with complete bilateral absence of the CV proximal to the antecubital fossa. Dissection revealed enlarged basilic veins (BV) and MCVs that crossed superficially to the bicipital aponeurosis and continued distally along the anterolateral side of the forearms towards the hands. Both limbs also showed a small anastomosis between the large MCV and the deep brachial vein (DBV) just distal to the bicipital aponeurosis. The BV on the right limb gives off one branch as the MCV that continues along the radial aspect of the forearm. Additionally, two smaller branches emerge and circumvent the medial epicondyle of the humerus and rejoin to form one vein that continues along the medial aspect of the forearm. The left limb showed an interesting anastomotic ring within the portion of the vein that would normally represent the MCV just distal to the bicipital aponeurosis. In contrast to the right limb, there was only one smaller branch from the BV that coursed around the medial epicondyle and travelled along the dorsal aspect of the forearm. The absence of the CV in the deltopectoral groove of both shoulders was also noted. Conclusions: This cadaveric case study illustrates a unique presentation of the upper limb venous architecture. With a significant portion of the U.S population requiring hemodialysis and/or developing end-stage renal disease, there has been an increase in the number of AV fistula procedures performed each year. Therefore,

having a greater awareness of the variations of the CV may help to prevent complications in vascular procedures that require its use.

Assessing Social Determinants of Health in Women of Reproductive Age and Exploring Community Resource Solutions

Abstract ID: UNTHSC207 Research Area: Pediatrics & Women's Health Presenter: Destinie Settlemyre OMS-II Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Destinie Settlemyre
- Maria Crompton
- Didi Ebert-Blackburn

Abstract:

Purpose: Social determinants of health are recognized as important factors in health outcomes and life expectancy. These factors have been shown to significantly impact vulnerable populations, such as women. Disparities in this population are known to worsen maternal-fetal outcomes by increasing the risk of gestational diabetes, maternal mortality, preterm birth, and low birth weight. Interventions directed toward social determinants have been shown to improve health and are essential to patient-centered care. This study aims to highlight the presence of social needs in this population and to identify specific opportunities we have in our roles as providers to address these health disparities. Methods: This study focused on women of reproductive age, defined as 18-45. Sixty women were surveyed using a validated survey tool to assess several areas of social health and identify any needs. After completion of the survey, community resources were offered to assist with the areas of need that had been identified. These results were later analyzed to identify specific needs in this population as compared to the general population. Results: 73% of the women who completed the survey had at least one social need. Of those with need, 85% had food insecurity related to socioeconomic status. This is over six times greater than the current overall clinic rate of 13%. After needs were identified, almost all participants were receptive to the community resources offered and expressed plans to utilize them. Conclusion: With an increase in social need comes a decrease in the quality of health for women of reproductive age. This study demonstrates the increased prevalence of need in this population, especially in food insecurity. It is clear that more frequent screening for food insecurity and other social needs are needed to monitor the well-being of reproductive-aged women. Once needs are identified, women are willing to take action to improve their lives if community resources are offered to them. Clinicians are the connection between a patient's needs and the community resources that can meet those needs. Incorporating a standardized survey and community resource list into clinical practice has the potential to

bridge the health disparity gap displayed in this patient population to improve maternalfetal outcomes. In addition, gaining more data across multiple clinics would provide the evidence necessary to influence policy change that can help to improve the health of future generations.

Emerging functional crosstalk between the Grx system and Nrf2 pathway: evidence from UV radiation-induced cataract formation

Abstract ID: UNTHSC204 Research Area: Eye / Vision Presenter: Terry Dang Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Terry Dang
- Hongli Wu

Abstract:

Glaucoma, cataracts, age-related macular degeneration (AMD), are linked to oxidative stress by the external and internal environment. Ocular tissues are more susceptible to oxidative stress due to daily exposure of UV light and high oxygen consumption. The human body has several antioxidant enzymes such as catalase, superoxide dismutase (SOD), and thioredoxin. Nuclear factor erythroid 2-related factor 2 (Nrf2) is an antioxidant enzyme transcription factor that regulates the downstream antioxidant genes. It also has glutathione (GSH) that searches for the free radicals in our body and oxidizes to form glutathione mixed disulfide (GSSG). As the GSSG levels increase, it naturally adds to other proteins causing protein glutathionylation (PSSG). PSSG is an important post-translational modification linked to oxidative stress. Research has shown that the glutaredoxin (Grx) system is capable of reversing PSSG formation which can be assumed to cause less oxidative stress. To take a closer look at the function of the Grx system in protecting the lens against ultraviolet (UV)- induced cataract formation, glutaredoxin (Grx1) and glutaredoxin 2 (Grx2) is studied in a Grx1/Grx2 double knockout (DKO) mice model. By intercrossing Grx1 knockout (KO) and Grx2 KO mice, Grx1/Grx2 DKO mice resulted. The study population was half male and half female, one month old Grx1/Grx2 DKO and age-matched wild type (WT) mice. They were exposed to 20.6 kJ/m2 UV radiation for 15 mins to induce cataracts. Mice were euthanized at 4 days post-exposure. The degree of the cataract and lens morphology were evaluated under a dissecting microscope. Glutathione (GSH), free protein thiol (PSH), and protein glutathionylation (PSSG) levels were measured as general markers of oxidative damage. To further define the crosstalk between the Grx system and nuclear factor erythroid 2-related factor 2 (Nrf2) antioxidant pathway, Nrf2 and its downstream target proteins were examined by using Western blot analysis. The results showed that UV radiation caused more severe anterior subcapsular cataract in Grx1/Grx2 DKO than that of WT mice. The opacity of the lenses in DKO mice, appeared to extend deeper into the cortical and even nuclear regions. Lenses of Grx1/Grx2 DKO mice contained significant lower levels

of GSH and PSH. On the other hand, the accumulation of PSSG, a marker for protein thiol oxidation, was much higher in Grx1/Grx2 DKO group. Deletion of Grx1 and Grx2 also decreased the expression of antioxidant enzyme transcription factor regulator, Nrf2, and its downstream antioxidant genes, including catalase, superoxide dismutase (SOD), and another redox regulator of thioredoxin (Trx). The Nrf2 dependent antioxidant response can no longer function with combined Grx1 and Grx2 deletion. This will cause more oxidative stress and increase the lens susceptibility to UV-induced damage.

Molecular Tumor Boards in Pediatric Oncology: An Argument for a Multidisciplinary Approach

Abstract ID: UNTHSC201 Research Area: Cancer Presenter: Angela Liu Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Angela Liu
- Paige Vicenzi
- Ishna Sharma
- Christa Teller
- Micha Koentz
- Heidi Trinkman
- Kelly Vallance
- Anish Ray

Abstract:

Purpose: Although precision oncology has been shown to improve patient outcomes, it remains challenging to apply results from molecular tumor profiles to clinical decision making, since accurate interpretation of these complex molecular findings requires expertise from various fields of medicine. To aid in interpretation of increasingly complex biomarkers, molecular tumor boards (MTBs) have been established across the nation. This study provides a convincing argument for a multidisciplinary approach toward MTBs. Methods: Molecular profiling of tumor specimens was accomplished through Foundation One Medicine, Inc. to detect genomic alterations in DNA and RNA, microsatellite status, tumor mutation burden (TMB), and programmed death ligand-1 (PDL-1) expression. Cases were evaluated by a multidisclipinary MTB consisting of pediatric oncologists, pathologists, clinical pharmacists, geneticists, and nurse coordinators. If targetable mutations were present, clinical pharmacists led in weighing treatment options and exploring the logistics and feasibility of drug access. Results: From March 2016 to September 2021, 115 cases were evaluated by the MTB. In 85% of cases, the MTB recommended targeted therapy based on evaluation of patient history and genetic alterations detected by Foundation One testing. Treatable alterations most frequently occurred in the cell cycle/DNA processing pathway, specifically involving the genes TP53 (21, 11%) and MLL (21, 11%). The MTB was able to provide treatment recommendations based on detected genomic mutations for the majority of cases. However, only three patients received MTB-recommended targeted therapy, one of whom experienced improved clinical outcomes. Conclusion: The most common reason that MTB-recommended treatment was not administered was that the molecular profiling was

not performed until late disease stages. For the three patients who received MTBrecommended therapy, it was not administered until months after diagnosis, demonstrating a deviation from MTB recommendations in favor of physician preference. Educating providers on demonstrated clinical benefit of molecular-matched precision therapy may increase acceptance of these novel targetable therapies, improving patient survival and quality of life.

Preparing Physicians for Utilizing Technology in Healthcare

Abstract ID: UNTHSC200 Research Area: Education Presenter: Michael Bejarano Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Michael Bejarano
- Rita Patterson

Abstract:

Purpose: Healthcare has become increasingly reliant on technology, creating a steep learning curve for physicians seeking to implement modern technology into their clinical practice. Thus, acquiring a sound understanding of point-of-care technology is necessary to improve patient outcomes and reduce potential harm. To determine the degree to which future physicians feel prepared to welcome this increasing dependence on technology, current 3rd- and 4th-year UNTHSC medical students were surveyed before and after taking an elective course in healthcare technologies. The objective of the survey was to identify the extent of medical student knowledge of technology applications in medicine and their comfort level in applying their knowledge in clinic. Methods: A survey was conducted for medical students enrolled in the Healthcare Emerging Technologies course at UNTHSC, both prior to the course and again following course completion. The survey elicited the comfort level of students in using technology in medicine in addition to the student's belief in the applicability of various technologies in future medical practice. The technologies specified in these questions included: augmented virtual reality, 3D printing, wearable technology, mobile applications, robotics, and artificial intelligence. Survey participants were given a sliding scale of 0-100 to gauge both their comfort level in working with the specified technology as well as their belief in the applicability of the technology in medicine. The survey results for comfort level were grouped into five categories: 0-19 ("very uncomfortableâ€□), 20-39 ("uncomfortableâ€□), 40-59 ("neutralâ€□), 60-79 ("comfortableâ $\in \Box$), and 80-100 ("very comfortableâ $\in \Box$). The survey responses belief in the applicability of a particular technology were also grouped into five categories: 0-19 ("strongly disagreeâ€□), 20-39 ("disagreeâ€□), 40-59 ("neutralâ€□), 60-79 ("agreeâ€□), and 80-100 ("strongly agreeâ $\in \Box$). Results: The survey population consisted of 280 medical students that completed the pre-course survey and 200 students that completed the postcourse survey. Following course completion, student comfort level with technology increased with respect to the following sectors: augmented virtual reality (+141%), 3-D printing (+140%), wearable tech (+62%), mobile applications (+24%), robotics (+112%), and

artificial intelligence (+154%). Student belief in the applicability of technology in healthcare increased in the following sectors as well: augmented virtual reality (+52%), 3-D printing (+17%), wearable tech (+13%), mobile applications (+5%), robotics (+11%), and artificial intelligence (+34%). Conclusion: Providing the survey to students prior to their Healthcare Emerging Technologies course assessed their perceptions of technology in medicine. Following their participation in the class, student comfort in working with these technologies in their future medical career increased dramatically. Student confidence in the applicability of technology in healthcare increased to a lesser extent $\hat{a} \in \hat{a}$ based on pre-course survey responses, many students already held strong beliefs on the utility of technology in medicine, and the knowledge they obtained from the class solidified this belief. Given the lower comfort level of students in working with medical technology, it is necessary to give students the opportunity to discover and learn the usefulness of point-of-care technologies here at UNTHSC.

Cardiovascular Response to Endotoxin-Mediated Sepsis: A Dose-Response Study

Abstract ID: UNTHSC199 Research Area: Immunology Presenter: David Salinas Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- David Salinas Aguirre
- Richard Martinez
- Cooper Warne
- Robert Mallet
- Gregory Dick
- Johnathan Tune
- Lisa Hodge

Abstract:

Purpose: Our long-term goal is to advance our understanding and treatment of sepsis, a potentially life-threatening condition that occurs when the response to infection causes tissue and organ damage. Sepsis can be caused by lipopolysaccharide (LPS), a major component of the outer membrane of Gram-negative bacteria. We used a swine model of LPS-induced sepsis to study the impact of the lymphatic and immune systems on the disease progression. Our first experiments were aimed at determining the optimal dose of Escherichia coli LPS in order to study the effect of sepsis on the cardiovascular system. We hypothesized that 2-hour intravenous infusions of 1- 50 $\hat{A}\mu g/kg$ LPS would reveal dose- and time-dependent changes in hemodynamic parameters that are consistent with sepsis. Methods: Yorkshire pigs (61 \hat{A} ± 4 kg, n = 4, 2 male) were sedated, intubated, and ventilated. Femoral artery and venous lines were placed to allow measurement of blood pressure, infusion of LPS, and blood gas sampling. A thoracotomy was performed in order to secure a Transonic flow probe around the left anterior descending coronary artery and to insert a sampling catheter in the anterior cardiac vein. A dose of LPS (1, 5, 25, and 50 $\hat{A}\mu g/kg$) was given to each pig over 2 hours. Blood samples were collected immediately before LPS infusion and for every 30 minutes during and after LPS infusion for blood gas measurements. Vital signs were recorded as the animals developed sepsis. Results: Only the pig given the lowest dose of LPS (1 $\hat{A}\mu g/kg$) survived the full 6 hours (mean survival time in remaining 3 pigs was 180 \hat{A} ± 30 min). At 150 min, a \hat{a} ‰ $\hat{55}$ % decrease in mean arterial pressure was observed (107 \hat{A} ± 4 to 48 \hat{A} ± 13 mmHg), resulting in a \hat{a} ‰ \hat{A} increase in heart rate (91 \hat{A} ± 9 to 146 \hat{A} ± 14 beats/min). Coronary blood flow and myocardial oxygen consumption decreased \hat{a} %²⁸% (0.53 ű 0.06 to 0.38 ű 0.02

ml/min/g) and $\hat{a}_{00}^{33\%}$ (60 ű 6 to 44 ű 2 ŵl/min/g), respectively. Ventricular fibrillation was the cause of death in the 3 non-surviving pigs. Conclusion: A dose of 1 ŵg/kg appears to be an optimal dose for future studies, as this dose was survivable in the desired time frame, while causing hypotension and tachycardia. In future studies, this model will allow us to study the effect of novel therapeutics during acute sepsis.

Association Between bilingualism and Amyloid Uptake Among Mexican Americans: An HABS-HD Study

Abstract ID: UNTHSC197 Research Area: Aging / Alzheimer Presenter: Elizabeth Wiley Submission Type: Competition Poster Department: Institute for Translational Research Classification: TCOM DO Student (2nd Year)

Author(s):

- Elizabeth Wiley
- Leigh Johnson
- James Hall
- Melissa Petersen
- Sid O'Bryant

Abstract:

Background: Bilingualism is thought to provide protective benefits in regions of the brain associated with the onset of Alzheimer's Disease (AD). While there has been extensive research on bilingualism's effect on grey matter volume, there is no study to date that has examined the relationship between bilingualism and amyloid burden within brain regions characteristically impacted by AD. This study aims to fill this gap by comparing amyloid deposition in Mexican Americans who are either monolingual or bilingual. Methods: Data were analyzed on n=34 Hispanic, Mexican Americans (n=16 bilingual; n=18 monolingual) participants enrolled in a study of health disparities with available Amyloid PET scans. PET Amyloid scans were conducted using florbetaben (18F) on a Siemens Biograph Vision 450 whole-body PET/CT scanner. PET Amyloid SUVR levels were generated from the following Regions of Interest (ROIs): Frontal, Anterior Posterior Cingulate, Lateral Parietal, Lateral Temporal, and Global, with global SUVR>1.08 determined as the cut-off for Amyloid positivity. Independent t-test and chi-square tests were conducted to examine group differences in language status across demographic variables. One-way ANOVAs were conducted to examine groups differences in APOE e4 carrier status as well as in language capabilities (monolingual, bilingual) and PET amyloid SUVR. Follow-up analyses examining language capabilities were split by APOE e4 carrier status (carrier, non-carrier). Results: In comparison to APOE e4 non-carriers, APOE e4 carriers experienced significantly increased amyloid burden across all regional areas, including global (p < 0.05). Bilingual APOE e4 noncarriers showed a significantly increased amyloid deposition in the Anterior/Posterior Cingulate cortex in comparison to monolingual APOE e4 non-carriers. Furthermore, among APOE e4 non-carriers, there was a trend towards significance for global amyloid uptake (p=0.059), with bilinguals again showing higher amyloid burden. Among APOE e4 carriers, no significant associations were found between language status (monolingual, bilingual) and amyloid uptake. Discussion: This was the first study to examine the association between bilingualism and amyloid burden within specific cortical regions of the brain. Results contradicted previous work observing the role of the posterior/anterior cingulate in bilingualism. The trend towards significance in global amyloid uptake for APOE e4 noncarriers favored increased burden in bilinguals, a result opposite of what was expected. Bilingualism is complex and multifactorial and further work is greatly needed to understand the link it has with amyloid burden particularly by disease state.

A Retrospective Chart Review of COVID-19 Infection and Pregnancy Outcomes

Abstract ID: UNTHSC138 Research Area: Pediatrics & Women's Health Presenter: Aimee Seale Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Aimee Seale
- Alison Pasciucco
- Morgan O'Neal
- Andi Winn

Abstract:

Purpose: Investigating possible effects, outcomes, and complications of the novel COVID-19 virus and related treatments during pregnancy is imperative to maintain proper care for women throughout pregnancy and postpartum. The COVID-19 pandemic has posed new challenges for physicians caring for patients during and after pregnancy. The aim of this study performed at UNTHSC Obstetrics and Gynecology clinic was to evaluate the effects of COVID-19 disease on pregnancy outcomes. Methods: This retrospective chart review included 43 patients who tested positive for COVID-19 during pregnancy. All patients delivered between November 2020 to August 2021. Patient demographics and delivery outcomes were collected from the electronic medical record. Demographic data included gestational age at diagnosis, severity of disease, incidence of outcomes such as preterm birth (PTB), preeclampsia (PEC), birth weight, method of delivery, and gestational diabetes (GDM). Following data collection, Texas statistics were gathered to compare incidence of these outcomes following COVID-19 diagnosis to the incidence in the general Texas population. Results: Data analysis found incidence of the most significant outcomes following data collection. Notably all patients presented with mild disease. When compared to Texas statistics, the incidence of low-risk cesarean section (28.40% Texas, 37.21% UNTHSC), gestational hypertension (8.90% Texas, 13.95% UNTHSC), and GDM (6.40% Texas, 6.98% UNTHSC) were comparable. Results for PEC (5% US, 4.65% UNTHSC) were compared to United States average rather to Texas average due to inconsistency in state specific data, and the outcomes remained comparable. Outcome for low birth weight (8.40% Texas, 2.33% UNTHSC) and PTB (10.80% Texas, 4.89% UNTHSC) were the outlier data points as these did not match closely with Texas statistics. Conclusion: This study was limited by small sample size. Further research is still warranted to evaluate the spectrum of effects of COVID-19 infection on pregnancy outcomes. Results from this study revealed incidence of the most common and severe complications associated with COVID-19 infection in pregnancy were not significantly increased from the general population when compared to published state data.

Providing healthcare to rural populations with Real Time Remote Telementored Ultrasound

Abstract ID: UNTHSC135 Research Area: Community Medicine Presenter: Katy Wyszynski Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Katy Wyszynski
- Lesca Hadley
- John Gibson

Abstract:

Introduction University of North Texas HSC medical students learn Point of Care Ultrasound (POCUS) in clinical settings as part of their curriculum. In 2021, students provided healthcare screenings and ultrasound scans to hundreds of patients in underserved rural communities in West Texas. Students utilized Butterfly's teleguidance technology to perform complex scans for the first time by using Remote Telementored Ultrasound (RTMUS) which allows a two-way video call, so that a remote practitioner visualizes the ultrasound scan and the probe location on the patient in real time. Methods We encountered a 62-year-old female with a 2/6 systolic ejection murmur. She noted a history of congenital heart disease diagnosed at birth, but the patient was unsure of the diagnosis and has not seen a cardiologist in many years. POCUS was performed on the patient. Results This patient had grossly normal cardiac POCUS examination. However, one anatomical location at the base of the patient's interventricular septum appeared thin. From her medical history and cardiac imaging, the remote practitioner approximated that she had a previous ventricular septal defect at birth that closed spontaneously. Discussion POCUS is a valuable tool in rural settings for patient management. Using RTMUS, trained physicians and students can bring advanced technology to remote settings using experts in distant locations, allowing ultrasound to serve as an adjunct to the physical exam even in places where healthcare inequalities commonly exist. With the expansion of this technology, RTMUS has the potential to provide ultrasound technology to underserved populations globally.

A Giant Ovarian Mucinous Cystadenoma and Low-Grade Appendiceal Mucinous Neoplasm in a Post-Menopausal Woman

Abstract ID: UNTHSC133

Research Area: Pediatrics & Women's Health Presenter: Brian Aguirre Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Brian Aguirre
- Hollis Bartels

Abstract:

Background: Ovarian mucinous cystadenomas are benign cystic tumors which originate from the surface epithelium of the ovary and rarely present during late age. Low grade appendiceal neoplasms (LAMN) are some of the rarest appendiceal tumors and only make up 0.7-1.7% of appendiceal tumor cases. Case Presentation: A 61-year-old woman was referred to the clinic due to a large abdominopelvic mass and complaints of abdominal pain, shortness of breath, and post-menopausal bleeding. She was a multiparous woman (G4P5), 160.02 cm, 121.109 kg and has a BMI of 47.4 kg/m2. She had a history of hypertension, and a previous history of spinal tumor surgery. Imaging studies were significant for a 37×10^{-1} 27 x 28 cm cystic mass originating from the left adnexa and smaller cysts originating from the right adnexa. Pap smear and endometrial biopsy were negative. Laboratory studies included CA125, CA19-9, and CEA. Those were found to be 11 U/mL (normal < 35 U/mL), 174 U/mL (normal < 34 U/mL), and 0.6 ng/mL (normal < 2.5 ng/mL in an adult nonsmoker) respectively. Given the large size of the masses and elevated CA 19-9, the patient was referred to gynecological oncology for further assessment. After consideration of the imaging, labs, and patient's symptoms, the treatment plan suggested was a total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAHBSO) to remove the masses. During the TAHBSO, an incidental appendiceal mass was noted and an appendectomy was performed. The gross pathology report revealed that the adnexal masses were bilateral mucinous cystadenomas, and the appendiceal mass was a LAMN. The uterus with the cystic ovaries were found to weigh 11.3 kg and measure $45 \times 40 \times 30 \text{ cm}$. The large cyst measured 42 cm and the smaller cyst measured 7 cm. The appendix measured 4.5 x 0.7 x 0.7 cm with the LAMN measuring 1.5 cm. The LAMN involved the muscular wall, and the margins were negative. Accordingly, no further treatment was necessary. Conclusion: This case report brings forth a unique case of 61-year-old patient who presented with bilateral mucinous cystadenomas and a LAMN. Mucinous cystadenomas

themselves comprise about 15% of ovarian tumors and LAMN make up less than 2% of appendiceal cancers.

Outcomes in Subgroups of Patients with Chronic Low Back Pain Treated With and Without Osteopathic Manipulative Treatment: A Retrospective Cohort Study

Abstract ID: UNTHSC130 Research Area: Physical Medicine / OMM Presenter: Samuel Moore Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Samuel Moore
- Kassidy Fix
- Lillian Blair
- Khanh Ta
- John Licciardone

Abstract:

Purpose: Chronic low back pain (CLBP) is a public health issue that often causes disability and yields high societal costs due to lost productivity. Clinical practice guidelines in the United States recommend spinal manipulation as a first-line treatment for CLBP. Recent evidence demonstrates that osteopathic manipulative treatment (OMT) may reduce low back pain intensity and back-related disability in patients with CLBP. However, it is unclear if patient subgroups respond differently to OMT. This study aims to determine if OMT effects in patients with CLBP differ according to patient characteristics. Methods: This study was conducted within the Pain Registry for Epidemiological, Clinical, and Interventional Studies and Innovation between April 2016 and December 2021. A total of 1243 registry participants reported data on sociodemographic characteristics, psychological variables, and clinical status at enrollment, and 788 provided complete data over 12 months of follow-up. Participants were classified as OMT users or non-users at enrollment. The primary outcomes were low back pain intensity measured with a numerical rating scale (NRS) from 0 to 10, back-related functioning measured with the Roland-Morris Disability Questionnaire (RMDQ), and pain impact derived from the Patient-Reported Outcomes Measurement Information System. Repeated measures analysis of variance was used to assess longitudinal outcomes according to OMT use. Subgroup analyses were then performed using 14 pre-specified variables to identify interaction effects relating to OMT use. Results: At enrollment, 177 (14.2%) participants reported ever using OMT for CLBP. Osteopathic manipulative treatment use was less likely to be reported by Blacks (P< .001) and participants currently using NSAIDs for low back pain (P=.003). Overall, over 12 months, OMT users reported lower scores than non-users for low back pain intensity (NRS score mean difference, a"€0.54; 95% CI, a"€0.87 to a"€0.21; P=.001); back-related disability (RMDQ score mean

difference, $\hat{a}^{"} \in 2.10$; 95% CI, $\hat{a}^{"} \in 3.24$ to $\hat{a}^{"} \in 0.96$; P< .001); and pain impact (mean difference, $\hat{a}^{"} \in 2.67$; 95% CI, $\hat{a}^{"} \in 4.39$ to $\hat{a}^{"} \in 0.95$; P=.002). Subgroup analyses showed that the only interaction effect involved gender. Male OMT users reported better outcomes (as compared with male non-users) than did female OMT users (as compared with female non-users) for all primary outcomes (NRS score mean difference for males, $\hat{a}^{"} \in 1.12$, 95% CI, $\hat{a}^{"} \in 1.76$ to $\hat{a}^{"} \in 0.47$ vs. $\hat{a}^{"} \in 0.34$; 95% CI, $\hat{a}^{"} \in 0.72$ to 0.04 for females; P=.04; RMDQ score mean difference for males, $\hat{a}^{"} \in 1.33$, 95% CI, $\hat{a}^{"} \in 2.65$ to $\hat{a}^{"} \in 0.01$ for females; P=.02; pain impact score mean difference for males, $\hat{a}^{"} \in 1.58$, 95% CI, $\hat{a}^{"} \in 3.57$ to 0.40 for females; P=.04). Conclusion: Patients who were current or former users of OMT reported better longitudinal outcomes over 12 months relating to low back pain intensity, back-related disability, and pain impact. Subgroup analyses found that OMT use (vs. non-use) consistently yielded better longitudinal outcomes in males than in females. However, none of the other 13 pre-specified variables was associated with a significant interaction for OMT effect.

Early Axial Interfragmentary Motion and its Impact on the Fracture Healing Environment: A Scoping Review

Abstract ID: UNTHSC129 Research Area: Other Presenter: Griffin Rechter Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Griffin Rechter
- Ryan Anthony
- Justin Rennard
- James Kellam
- Stephen Warner

Abstract:

Purpose: The initial interfragmentary motion (IFM) at a fracture site determines the mode of fracture healing. Controlled axial IFM is thought to promote successful fracture healing, however the effects of minimal and excessive IFM can be detrimental to osteogenesis. Understanding the consequences of altering the fracture environment is important to advance our comprehension of fracture healing and has implications for surgical interventions. This review aims to consolidate information from the literature to assess our understanding of the effects of early axial IFM on fracture healing outcomes. Methods: PubMed and Medline databases were queried to identify studies from inception until June 2021 assessing axial IFM on fracture healing outcomes. 4,972 studies were initially identified. Following recommendations from PRISMA guidelines, two independent reviewers screened all studies, and data was extracted into a standardized spreadsheet. All outcome measures were recorded, including histomorphometric and radiographic analysis of the callus, biomechanical testing of callus strength, and time to union. Data synthesis is presented as a narrative review of our findings. Results: Fifteen studies met inclusion criteria totaling 605 fractures and osteotomies in skeletally mature participants. 423 animal and 182 human subjects were examined. Nine studies investigated IFM at the tibia, 4 at the metatarsus, and 2 at the femur. The gap size did not exceed 6mm in any study. The range of IFM in investigated tibias, metatarsi, and femurs was 0.32-2.0mm, 0.1-2.4mm, and 0.03-1.0mm, respectively. The median time to analysis was 9 weeks. Notable findings included no statistically significant association between early IFM and healing outcomes in experimental femur studies. All experimental tibial studies showed positive effects on callus formation with small-to-moderate axial IFM. Most studies found that allowing early micromovement produced superior callus stiffness and rigidity compared to rigid fixation, however continuing to increase the IFM negatively impacted biomechanical outcomes

despite producing a larger callus. While increasing IFM often led to an enlarged callus size, the callus quality was compromised. Conclusions: The range of initial axial IFM conducive to a favorable fracture healing environment remains elusive. Preliminary evidence suggests an association between small-to-moderate initial axial IFM for stimulating successful fracture healing. However, heterogeneity in results and methodology precluded meta-analysis and comparability amongst studies. The cumulative evidence in the literature is insufficient to determine a definite correlation between the axial IFM and fracture healing outcomes. Future research should be directed at controlled trials and investigation of human subjects to understand the implications of orthopedic interventions on fracture healing outcomes.

Point of Care Ultrasound Diagnosis of Deep Vein Thrombosis by Medical Students

Abstract ID: UNTHSC126 Research Area: Education Presenter: Cassidy Miller Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Cassidy Miller
- Sadie Thompson

Abstract:

Deep venous thrombosis (DVT) is the most common type of venous thromboembolism. The feared complication of a DVT is the progression to a pulmonary embolism. Many DVTs can resolve spontaneously but screening and diagnosis are important for management to decrease progression to a pulmonary embolism and reduce the risk of morbidity and mortality. The purpose of this study was to determine if point-of-care ultrasound sonography by third-year medical students is sufficient in the diagnosis of a DVT. Students were trained on two point DVT screening using an in-person training session and an on-line training module. While on their family medicine rotations students obtained images of their screenings using a hand-held ultrasound and uploaded them to be graded. Studies will be deemed satisfactory if five out of six images obtained correctly identify the appropriate structures. The eleven students that participated completed a total of 110 studies. Of these studies a total of 97 studies were deemed satisfactory after expert review, for an overall study satisfaction of 88.18%. Of the eleven students, seven participants had 100% satisfaction in their studies, one had 90%, one had 80%, one had 70% and one had 40%. We conclude that students are able to obtain satisfactory images of the deep legs of the vein using point of care sonography after a 1 hour training session. All students except for one who participated were able to demonstrate competency from the study images that were obtained and reviewed. Third year medical students can be proficient enough with point-of-care ultrasound to screen for DVT. This has great application for rural medicine as well as these portable ultrasounds were sufficient enough to complete these screenings.

Parsonage Turner syndrome following COVID19 vaccination in a cancer patient: A case report

Abstract ID: UNTHSC124 Research Area: Physical Medicine / OMM Presenter: Drew Ferguson Submission Type: Competition Poster Department: Other Classification: TCOM DO Student (4th Year)

Author(s):

- Drew Ferguson
- Tai Yasuda
- Omar Selod

Abstract:

Background: Parsonage Turner syndrome (PTS) is a rare condition involving inflammation of the brachial plexus. Causes of PTS include inflammatory processes following infections, vaccinations, and surgery. PTS following COVID19 infections and COVID19 vaccinations have been reported. In this case, the patient presented with severe shoulder pain and weakness in the left upper extremity following the second dose of the COVID19 vaccine. This case is complicated by a history of recent chemotherapy and positive COVID19 infection. Case Description: The patient is a 56-year-old male presenting to the physiatry clinic with severe left shoulder pain and weakness for five months beginning approximately twenty-four hours after the second dose of the COVID19 vaccination. Symptoms were exacerbated with abduction and external rotation. He has a history of renal cell carcinoma with metastasis treated with chemotherapy and a history of COVID19 infection prior to the vaccine. Physical exam revealed left deltoid atrophy with limited abduction and external rotation. Electrodiagnostic evidence of left sided brachial plexopathy involving the upper, middle, and lower trunks was found on EMG/NCS. MRI of the left shoulder showed edematous signal in proximal and infraspinatus muscles, consistent with PTS. Conclusions: Although the etiology of PTS is largely unclear, there is a large immune component in the development of PTS considering most cases occur after infections and vaccinations. Dysregulation of the immune system following chemotherapy may have contributed to the development of PTS in this case. COVID19 infection prior to the vaccine series may have also contributed to a heightened immune response. Risk factors for PTS include recent infections, vaccinations, and surgery. Considering the role of the immune system in developing PTS, immunocompromised conditions should also be considered as possible risk factors. It is important to identify patients at increased risk for PTS and discuss PTS as a potential adverse effect of the COVID19 infection and vaccine.
Discontinuation of Basal and Bolus Insulin using a Combined Dietary and Pharmacologic Approach in a Patient with Type 2 Diabetes and NASH-Cirrhosis in the Primary Care Setting

Abstract ID: UNTHSC123 Research Area: Diabetes Presenter: Tai Yasuda Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Tai Yasuda
- Dante Paredes
- Megan Wesling

Abstract:

Background: Currently, there are no FDA-approved pharmacologic treatments for NAFLD and lifestyle intervention remains first line. As patient adherence to dietary and exercise modification has limited success, NAFLD is currently the most rapidly increasing indication for liver transplant in Western countries. Further, NAFLD is considered an independent risk factor for both liver-related and all-cause mortality. Given that weight loss via dietary modifications is one of the few proven treatments for NAFLD, it is important to continue investigating the effectiveness of current dietary recommendations. Intermittent fasting (IF) has become an increasingly popular dietary regimen in the management of weight loss and metabolic disorders, including NAFLD. Time-restricted feeding (TRF) is a form of IF that allows intake of meals within a specific time frame, followed by periods of fasting. Fasting periods vary from 16 hours to several days and depend largely on patient tolerance and preference. This case report investigates the effectiveness of IF in a patient with severe NAFLD complicated by decompensated cirrhosis.Case Presentation: Patient is a 48-year-old male with past medical history of metabolic syndrome, meeting criteria with central obesity >40 in. circumference, HDL < 40, type 2 diabetes, and hypertension. He was admitted to the hospital for GI bleed in February 2021 with subsequent EGD showing ruptured esophageal varices. Further work up with abdominal CT showed fatty liver infiltrate with confirmed cirrhosis. Without history of excessive alcohol intake, use of hepatotoxic medications, or identifiable genetic causes, a diagnosis of NAFLD complicated by cirrhosis was made. At diagnosis, his weight was 303.2 lbs with BMI of 47.4. Medications included metformin 1000 mg BID, semaglutide 0.25 mg weekly, insulin glargine (U-300) 70 units daily, and insulin aspart 14 units TID plus sliding scale. Dietary interventions were discussed with patient and family in June 2021. Patient preferences, family adherence, access to food, and financial status were evaluated prior to initiation of dietary changes. After extensive

dialogue, the following TRF regimen was implemented: ketogenic diet (carbohydrates < 30g/ day) with all food consumed within an 8-hour feeding window and one 36-hour fast per week. Medications were adjusted to reduce the risk of hypoglycemia. Patient was monitored closely via continuous glucose monitor throughout the intervention. After 3 weeks, the patient was able to discontinue his basal and bolus insulin and repeat imaging at week 8 showed resolution of NAFLD via MRI and a weight loss of > 10%. Conclusions: Medically supervised, therapeutic fasting regimens can help reverse hepatic steatosis in NAFLD. Intermittent fasting is a practical dietary intervention that can also increase insulin sensitivity and improve blood glucose control. Considering lifestyle interventions are the only treatment for NAFLD, more research is needed to determine effectiveness of current recommendations.

Arthroscopic vs. an Open Procedure for the first time success rate of a Torn Rotator Cuff

Abstract ID: UNTHSC120 Research Area: Rehabilitative Sciences Presenter: Daniel Navid Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (1st Year)

Author(s):

- Daniel Navid
- Arpam Dutta
- Blake Campbell
- Moath Mohammad

Abstract:

Arthroscopic vs. an Open Procedure for the first time success rate of a Torn Rotator Cuff This paper will explore three published articles, data from Houston Northwest, and opinions from doctors in order to examine the two procedure techniques, arthroscopic vs. open surgery on the first time success rate of a torn rotator cuff. The first article by Ghodadra, Provencher, and Verma (2009) suggest that patients that "undergo all arthroscopic rotator cuff repair should undergo an accelerated postoperative rehabilitation program.â€□ The second paper conducted by Godley and Funk (2009) examine an arthroscopic repair of a rotator cuff and analyze outcomes over an 18-month period. The final area of examination was done by the author looking at the patient data base in Houston Northwest hospital. In this hospital, there have been over 200 rotator cuff repairs in the past 5 years. Each patient's chart was examined at the date of the repair finding out if was done arthroscopically or open. The chart was then further examined to see if there was a reoccurring problem or found at a later date. Finally, preferred methods will be given from Dr. Shawn Mansour, Dr. Moran, and surgical assistance to give their opinions on the different methods over the years. All of these sources were combined to find the best surgical option for the repair of a torn rotator cuff.

Case Report: Patient with 3 Gastric Cancers Simultaneously (Adenocarcionma, NET, GIST)

Abstract ID: UNTHSC57

Research Area: Cancer Presenter: Benjamin Jacobs Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Benjamin Jacobs
- Arsalan Ali
- Shankar Logarajah
- Rohan Jeyarajah

Abstract:

Background: Cancer is the second leading cause of death in the world second only to heart disease. The top three cancers by incidence for men are Lung, Prostate, and Colorectal. For women, the top three cancers by incidence are Breast, Colorectal, and Lung. Although gastric cancer does not crack the top three for men or women by incidence, gastric cancer is the second most common cause of cancer death worldwide. Of the different types of gastric cancer, adenocarcinoma of the stomach comprises nearly 95% of all forms of gastric cancer. The other less common types of gastric cancer include primary gastric lymphoma, gastrointestinal stromal tumor (GIST), and neuroendocrine (carcinoid) tumors. Diagnosis of the specific type of gastric cancer comes from the analysis of the removed specimen under the microscope. Multiple gastric cancers in a single patient are extremely rare and few cases have been reported. We report a case of a patient with three distinct types of gastric cancer in one pathology specimen. Case Information: The patient is a 77-year-old female who underwent total gastrectomy and distal esophagectomy in 2011 for concerning imaging and EGD studies consistent with cancerous lesions in her stomach. Upon examination under the microscope, the pathology report revealed three distinct cancers: 1) Mucinous adenocarcinoma 2) Well-differentiated neuroendocrine and 3) Gastrointestinal stromal tumor. After surgery, this patient underwent adjuvant chemoradiation and has been in remission and cancer-free going on 10 years. Conclusions: We present an extremely rare and peculiar case of a 77-year-old female who is 10 years post-op total gastrectomy and distal esophagectomy revealing three separate, coexisting, gastric cancers. Coexisting gastric cancers are very uncommon; however, physicians shouldn't rule out the possibility of their patients' having more than one type of cancer in the pathology specimen report. Understanding the different types of gastric cancer can alter therapy and change the plan moving forward (post-op) to recheck scans for lesions elsewhere in the body and undergo genetic testing for inherited mutations.

Meta-Analysis and Systematic Review of Post-Transplant Infection Rates Following Prophylactic and Preemptive Strategies in Solid Organ Transplant Recipients

Abstract ID: UNTHSC55 Research Area: Pharmaceutical Sciences Presenter: Nicholas te Poele Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Nicholas Tepoele
- Jason Ho
- Ashley McLeroy Te Poele
- Chase Darden
- Kollin Meyer
- Crystal Howell

Abstract:

Purpose : Standard of care to prevent infectious complications post solid organ transplant (SOT) generally involves prophylactic antimicrobial or preemptive monitoring strategies. This systematic review and meta analysis aims to compare rates of common viral and fungal post-SOT infections following either preemptive or prophylactic therapy strategies in kidney, liver, pancreas, lung, and heart SOTs. Methods : Data sources included PubMed, Embase, Medline Complete, Scopus, Web of Science, US National Institutes of Health's ongoing trials registry, Cochrane Library, email listservs, and references of included articles. Studies were considered for inclusion if they involved SOT patients who received an abdominal or thoracic organ, aged over 18 years, and recipients of either prophylaxis or preemptive prevention strategies for a qualifying pathogen within the first year of transplantation. Qualifying organisms included Candida species, Aspergillus species, Zygomycosis (multiple species), Cytomegalovirus (CMV), Herpes Simplex Virus (HSV), and Varicella Zoster Virus (VZV). Data extracted from eligible studies included study methods, prevention strategy used, and development of fungal and/or viral infections. The primary outcome was the odds ratio of opportunistic infections post-SOT when comparing preemptive and prophylactic strategies. Secondary outcomes included time to infection, rates of transplant rejection, rates of antimicrobial adverse events, and mortality rate. Results: 107 studies were extracted and pooled for analysis. Of the 14,464 patients included, 12,194 patients reportedly received prophylactic therapy, while 1,257 patients reportedly received preemptive therapy. Two of the most common infections were more prevalent in patients receiving preemptive therapy, CMV (OR 6.47; 95% CI, 5.72-7.32) and Aspergillus species (OR 2.92; 95% CI 1.99-4.27). Of patients who received preemptive therapy, 59.45% reported an infection with one of the

identified study pathogens (n=739) and of patients who received prophylactic therapy, 18.84% reported an infection (n=2,297) (OR 6.32; 95% CI, 5.59-7.14). Patients who received preemptive therapy consistently had an increased odds of infection across all categories, heart transplants (OR 12.73; 95% CI, 8.86-18.30), lung transplants (OR 10.95; 95% CI, 5.35-22.43), liver transplants (OR 4.35; 95% CI, 3.25-5.83), and kidney transplants (OR 2.94; 95% CI, 2.57-3.36). The mortality rate was not significantly different between preemptive and prophylactic therapies (OR 1.57; 95% CI, 0.98-2.53) nor was the rate of adverse effects (OR 1.04; 95% CI, 0.86-1.27). Meta-analysis of infection rates in 14 studies showed that the odds of infection in the preemptive group were 3.84 times that of the prophylactic group (OR 3.84; 95% CI, 2.03-7.26; p < 0.05). Analysis of rejection rates in 8 studies and of mortality rates in 4 studies showed no statistically significant differences. Conclusion : The incidence of infection within the first year of SOT is lower in recipients that receive prophylaxis compared to those that receive preemptive therapy but the rates of mortality and adverse effects were similar.

Interactive Association of Chronic Illness and Food Insecurity with Emergency Room Visits among Schoolaged Children in the United States

Abstract ID: UNTHSC54 Research Area: Health Disparities Presenter: Farheen Ghani Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Farheen Ghani
- Sydney Manning
- Usha Sambamoorthi

Abstract:

Objective: This study examined the prevalence of food insecurity among children aged 6-17 years and the interactive association of chronic conditions and food insecurity with healthcare utilization, specifically ER visits. Methods: Data on children aged 6-17 (N = 5,518, representing 50,479,419 children) were obtained from the 2017 Medical Expenditure Panel Survey (MEPS). We measured food insecurity (Yes/No) using responses to a 10-item food security scale developed and validated by the USDA, adapted here for the MEPS 30day window. Healthcare utilization consisted of cumulative ER visits in 12 months. Chisquare tests and adjusted Poisson regression were used to determine interactive associations of chronic conditions and food insecurity on ER visits. All analyses involved complex survey procedures. Results: 20% of school-aged children had food insecurity; 21% had a chronic condition. After adjusting for age, sex, race, insurance coverage, poverty status, physical and mental health status, obesity, and region, we observed that children with chronic conditions and food insecurity had a higher number of ER visits (Incident rate ratio = 2.79, 95% CI = 1.892, 4.120), compared to children without food insecurity and chronic conditions. Conclusions: 1 in 16 school-aged children had both a chronic condition and experienced food insecurity in the last 12 months. Food insecurity in children with chronic conditions was associated with more ER visits. Our findings suggest that policies and programs that provide linkages to community resources can help reduce food insecurity among children in the US and reduce healthcare utilization.

Putting the Pieces Together of an Online Classroom with the Help of Jigsaw

Abstract ID: UNTHSC53 Research Area: Education Presenter: Libby Bradley Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: GSBS Student

Author(s):

- Libby Bradley
- Emma Handler

Abstract:

Purpose: Anatomy has been deemed a cornerstone course within the health sciences. Recently, there has been an increase in online courses taught at university-level, including anatomy courses. Although there has been an increase in online teaching and learning in anatomy, there is still uncertainty regarding whether academic performance, satisfaction, and perceptions are equivalent between online and in-person anatomy courses. Additionally, throughout graduate courses, traditional learning (i.e., solely lecture-focused) has begun to transition with the implementation of active learning (i.e., an approach in which students are asked to engage in the learning process (not solely lecture-focused)). Previous research studies have established the effects of different active learning techniques implemented within in-person graduate anatomy courses, but little research has investigated the effects of active learning techniques implemented within online graduate anatomy courses. Therefore, a pilot study was conducted within an online Medical Science master's anatomy course measuring the perceived effects that jigsaw had on students' perception and satisfaction. Methods: Jigsaw was incorporated into 5 units of an online anatomy course. Students were randomly assigned into three expert groups, which were assigned objectives to review from lecture material. Then, two students from each expert group were assigned to teaching groups. In their teaching groups, each student created a short video to teach their designated objectives to their peers. At the end of the semester, students were asked to participate in the research study by completing a post-course survey that asked questions pertaining to course perceptions and satisfaction and their experiences regarding the active learning technique. Data was collected through Qualtrics and analyzed in NCSS using Spearman's correlation coefficient and Chi-squared tests. Results: Results from the post-course survey indicated that 77.3% of students (n=21) were satisfied with jigsaw. Moreover, students that used the teaching materials that their peers created during the teaching groups portion of jigsaw were 10% more satisfied than the students that did not (p < 0.05). Additionally, a significant, positive correlation was found when asked how effective jigsaw was when learning the course material compared to the helpfulness of

jigsaw (p< 0.05). Conclusion: These findings suggest that the students that actively participated in jigsaw perceived more effectiveness and satisfaction than the students that did not. Researchers are expanding on this study with the implementation of several other active learning techniques to examine the effects when comparing academic performance, perceptions, and satisfaction. While the benefits of active learning are widely known within in-person courses, there is little research on the effects of active learning within online courses. Furthermore, there is no research investigating the effects of jigsaw implementation within an online graduate anatomy course. With the help of this study and future research, a greater understanding can be found concerning how students can best learn in an online learning environment, with the implementation of active learning.

Trends in short sleep duration and trouble sleeping among US adults, 2005-2018

Abstract ID: UNTHSC50 Research Area: General Public Health Presenter: Shanshan Wang Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Shanshan Wang
- Matthew Rossheim
- Rajesh Nandy

Abstract:

Background: Better understanding current trends in prevalence of short sleep duration and trouble sleeping is critical for prevention and management of sleep problems. The objective of the study was to determine trends in prevalence of short sleep duration and trouble sleeping among US adults from 2005 to 2018, and assess how sleep trends vary by sex and race/ethnicity. Methods: Seven cycles of the National Health and Nutrition Examination Survey (NHANES) data between 2005-2006 and 2017-2018 were analyzed. Participants who were 18 years or older and provided completed data regarding sleep duration were included. The final analytic sample size was 41416. Trouble sleeping and sleep duration were self-reported. Short sleep duration was defined as sleep duration â‰× 6 hours. Agestandardized prevalence of trouble sleeping and short sleep duration were estimated among the overall US adult population, and by sex and race/ethnicity. Results: From the 2005-2006 cycle through the 2013-2014 cycle, the age-adjusted prevalence of short sleep duration remained similar in the overall population (p for trend>0.05). Non-Hispanic Black people had the highest prevalence of short sleep duration among all the race/ethnicity groups in all seven cycles. Prevalence of short sleep duration appears lower in 2015-2018 than in 2005-2014 due to different measurement methods applied. However, from 2005-2006 to 2017-2018, there were increasing trends in age-adjusted prevalence of trouble sleeping in the overall population, among both men and women, and all race/ethnicity groups (p for trend< 0.05). Compared to men, women had a higher prevalence of trouble sleeping. Among all the race/ethnicity groups, non-Hispanic White people had the highest prevalence of trouble sleeping. Conclusions: The prevalence of trouble sleeping increased significantly between 2005 and 2018, while no trends were detected in the prevalence of short sleep duration. Meanwhile, non-Hispanic Black people had the highest prevalence of short sleep duration, whereas non-Hispanic White people had the highest prevalence of trouble sleeping. These findings suggested that the sources contributing to the increasing trends in trouble sleeping were different from those contributing to the trends in short sleep

duration. Also, targeted management and prevention efforts should be made for different race/ethnicity groups to address the race/ethnic disparities in sleep health. Keywords: Trends, Prevalence, Short sleep duration, Trouble sleeping

Store-operated Ca2+ entry contributed to high glucoseinduced podocyte injury

Abstract ID: UNTHSC47 Research Area: Integrative Physiology Presenter: Yu Tao Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Yu Tao
- Sarika Chaudhari
- Parisa Yazdizadeh Shotorbani
- Rong Ma
- Zheng Chen

Abstract:

Purpose: Diabetic Nephropathy is one of the major complications of diabetes. Hyperglycemia is a known initiator of diabetes mellitus. Evidence suggests that podocyte injury is associated with diabetic nephropathy onset and progression. However, the mechanisms underlying podocyte injury induced by high glucose (HG) are poorly understood. Store-operated calcium entry (SOCE) is a multifunctional signaling pathway in many cell types. However, its role in podocyte injury in the settings of diabetes is not known. The present study was aimed to determine that enhanced SOCE mediated high glucose (HG)-induced podocyte injury by upregulating calpain activity. Methods: All experiments were performed using cultured human podocytes. Western blot was conducted to estimate Orai1, STIM1, and nephrin protein abundance. Ca2+ imaging was used to analyze SOCE. Confocal microscopy was used to visualize podocyte actin arrangement. Calpain activity was determined by calpain activity assay kits. Results: HG (25mM) treatment significantly increased Orai1, but not STIM1 protein abundance for time periods ranging from 2 to 12 hours. The HG-induced Orai1 response was dose dependent. Ca2+ imaging experiment showed that HG treatment for 12 hours significantly increased SOCE. In addition, HG treatment significantly decreased nephrin (a podocyte marker) protein abundance and resulted in cytoskeleton rearrangement by the formation of cortical F-actin. Both HG responses were significantly blunted by BTP2 (4 $\hat{A}\mu M$), a SOCE inhibitor. Furthermore, we found that activation of SOCE by thapsigargin $(1 \ \hat{I} \ M)$ increased calpain activity which was abolished by BTP2. In addition, BTP2 blunted the increased calpain activity induced by HG treatment. Moreover, calpeptin (a calpain inhibitor) attenuated the HG-induced reduction of nephrin protein abundance. Conclusions: The present study suggests that enhanced SOCE contributes to HG-induced podocyte injury by increasing calpain activity.

Nutritional Complications Following PEG-Asparaginase Administration in Pediatric Patients with ALL

Abstract ID: UNTHSC44 Research Area: Pediatrics & Women's Health Presenter: Christine Le Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Christine Le
- Rachel Hill
- Tyler Hamby
- Anish Ray

Abstract:

Background: Acute lymphoblastic leukemia (ALL) is the most common childhood malignancy in the United States. Lymphoblastic lymphoma (LL) is less common than ALL in the pediatric population but is often treated with ALL protocols. Polyethylene glycol (PEG) Lasparaginase, a mainstay chemotherapeutic to treat pediatric ALL, can cause a myriad of nutritional complications, including acute pancreatitis, hyperglycemia, hypertriglyceridemia, and exocrine pancreatic insufficiency. However, these complications and the appropriate treatments for them have not been well described in the literature. Case Information: Two pediatric patients with ALL and one pediatric patient with LL, who all received PEG-Asparaginase, faced adverse events leading to nutritional complications. The first patient, a 17-year-old-male diagnosed with ALL, experienced blood clotting issues, acute pancreatitis, hyperglycemia, and exocrine pancreatic insufficiency (EPI). The patient was managed with insulin and a low fat diet; however, due to severe weight loss and loose, oily stools, a fecal elastase was ordered and confirmed EPI. Therefore, the patient was transitioned to enteral nutrition (EN) and treated with pancreatic enzyme replacement therapy. The second patient, a 6-year-old female diagnosed with LL and on ALL chemotherapy protocol, experienced acute pancreatitis, constipation, and vomiting. Based on new recommendations developed by the team in treating pediatric oncologic patients with acute pancreatitis and the patient's poor oral intake, she was managed with a proactive EN feeding protocol. This was well tolerated by the patient, and she did not experience any additional episodes of acute pancreatitis. The third patient, a 7-year-old female diagnosed with ALL, experienced hypertriglyceridemia (>5200 mg/dL). Further complications of hyponatremia (presumed to be partially pseudohyponatremia related to hypertriglyceridemia), weight loss, and excessive stooling warranted the need for EN. The patient was initially fed with a very low fat (and subsequently high in carbohydrate) formula but was later switched to a more balanced peptide-based formula with a high ratio of medium chain triglycerides and lower

carbohydrate content. Conclusions: In this case series, three patients' courses were detailed following the nutritional difficulties they faced after PEG L-asparaginase administration. Although further studies are needed, this series sheds light on potential nutritional complications and interventions.

Incorporating Medical Students into the Development of Age Friendly Healthcare Systems through Quality Improvement Projects

Abstract ID: UNTHSC43 Research Area: Education Presenter: Sadie Thompson Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (3rd Year)

Author(s):

- Sadie Thompson
- Cassidy Miller
- Garrett Jackson
- Lesca Hadley
- John Gibson
- Jennifer Severance

Abstract:

Purpose: The world is aging. Health systems are often not prepared for the number or complexity of geriatric patients. Caring for this vulnerable population through age-friendly health systems is imperative for our future. With the universal lack of geriatricians, family physicians primarily care for the elderly population and are therefore ideally placed to lead changes to improve the lives of geriatric patients. The Rural Osteopathic Medical Education (ROME) Program partnered with UNTHSC's Center for Geriatrics to create geriatric-focused quality improvement projects (QIPs) for medical students to complete in their family medicine clerkships. Methods: Two cohorts of ROME students interviewed rural family physicians regarding the needs of their geriatric patient population. Students then partnered with the physician to develop geriatric QIPs which were implemented in the clinics. Following the conclusion of the projects, students were surveyed about their experience implementing geriatric QIPs during their clerkships. Results: In the first cohort, 100% of students stated that they were better able to analyze, collect, and communicate data about quality improvements in practice. 100% of students in this cohort stated that they would integrate QIPs into their practices. In the second cohort, 76% of students stated that they were better able to analyze and collect data for QIP. In this cohort, 71% of the students stated that they would actively integrate QIPs into their practices. 67% of the family physicians strongly agreed that QIPs were useful to their practice. Conclusions: Students identified best practices to address the health needs and concerns of older adults and their caregivers. The QIPs improved care for the elderly in addition to providing experience in implementing quality improvement methods that can be used in the students' future

medical practices. Incorporating medical students into QIPs in family medicine clinics is valuable for the patients, students, and physicians.

Acute Heat Exposure Protects Against Endothelial Ischemia-reperfusion Injury in Aged Humans

Abstract ID: UNTHSC42 Research Area: Cardiovascular Presenter: Holden W. Hemingway Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Holden Hemingway
- Rauchelle Richey
- Amy Moore
- Albert Yurvati
- Steven Romero

Abstract:

Non-pharmacological therapies that protect against endothelial ischemia-reperfusion injury (I/R) remain limited in aged adults. Acute heat exposure protects against endothelial I/R injury in young adults, but its efficacy has never been explored in aged adults. Therefore, we tested the hypothesis that acute heat exposure would protect endothelial-dependent vasodilation following I/R injury in aged adults. Nine (2 men, 69 ű 8 yrs) aged adults were exposed to a thermoneutral control condition or whole-body passive heating (waterperfused suit) sufficient to increase body core temperature by 1.2 ŰC. Experiments were separated by at least 7 days. Heat exposure was always performed first in order to timematch the thermoneutral control condition. Endothelium-dependent vasodilation was assessed via flow-mediated dilation of the brachial artery before (pre-I/R) and after I/R injury (post-I/R), which was induced by 20 min of arm ischemia followed by 20 min of reperfusion. Ischemia-reperfusion injury reduced flow-mediated dilation following the thermoneutral control condition (pre-I/R, 4.5 \hat{A} ± 2.9 % vs. post-I/R, 0.9 \hat{A} ± 2.8 %, P < 0.01), but was well maintained with prior heat exposure (pre-I/R, 4.4 \hat{A} ± 2.8 % vs. post-I/R, 3.5 \hat{A} ± 2.8 %, P = 0.5). Taken together, acute heat exposure protects against endothelial I/R injury in aged adults. These results highlight the therapeutic potential of heat therapy to prevent endothelial dysfunction associated with I/R injury in aged adults who are most at risk for an ischemic event.

Massage application to decrease anesthetic spread in brachial plexus blocks: A cadaveric study

Abstract ID: UNTHSC280 Research Area: Structural Anatomy Presenter: Taylor Coffman Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Taylor Coffman
- Cara Fisher
- Emma Handler
- Daniel Nash

Abstract:

Introduction: Peripheral nerve blocks of the brachial plexus have become increasingly popular for upper limb surgery due to the benefits of using regional anesthesia. However, anesthetic from supraclavicular nerve blocks can spread medially and anesthetize the phrenic nerve, leading to partial paralysis of the diaphragm, also known as hemidiaphragmatic paresis. The addition of ultrasound guidance has reduced the incidence of phrenic nerve involvement due to the ability to see the spread of anesthetic in real time. There has been little research focused on whether or not ultrasound massage could manipulate anesthetic distally down the arm and away from the phrenic nerve. The aim of this study is to determine if ultrasound massage can be used to minimize the spread of anesthesia medially. Methods: Four fresh frozen cadavers were injected with 15 mls of a 25:75 mixture of methylene blue and 2% lidocaine. The specimens were divided into control (n=4) and massage (n=4) groups. A nurse anesthetist used ultrasound guidance to perform a supraclavicular block. Immediately following injection, the massage group received 5 distally directed massage strokes with the ultrasound transducer. After 15 minutes, both groups were dissected and measurements of anesthetic spread were taken. The medial spread was measured in all four cadavers and distal spread was measured in three out of the four. Results: Spread of anesthetic medially was not reduced in the massage group when compared to the control group. Distal spread of the anesthetic was increased in the massage group when compared to the control group (p < 0.05). Conclusions: The similarity of medial spread between the two groups implies ultrasound massage application will not prevent phrenic nerve palsy any more than a traditional supraclavicular block. The increased distal spread of the anesthetic suggests this technique can improve anesthesia to the brachial plexus by increasing the area the anesthetic travels. Significance: The incidence of phrenic nerve palsy during a supraclavicular block has decreased since the introduction of ultrasound, but some reservations persist when using the technique in non-healthy patients.

Phrenic nerve palsy can cause respiratory distress in patients with pre-existing respiratory condition. Given the small sample size, continued study of this method is needed to further evaluate if this method could be used to reduce incidence of phrenic nerve palsy.

Hypertension at Home: How Telehealth Can Impact Hypertension Screening

Abstract ID: UNTHSC277 Research Area: General Medicine Presenter: Faria Khimani Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Faria Khimani
- Brandon Mallory
- Sujata Ojha
- Adam Wolf

Abstract:

Purpose: Telemedicine is a virtual or hybrid platform of delivering healthcare that has grown tremendously over the last decade thanks to technological advancements. Since the start of the COVID-19 pandemic in 2020, preventive care screenings of hypertension, diabetes, hyperlipidemia, and obesity have significantly declined due to hesitations with in-person visits and staffing limitations in clinics and hospitals. That combined with a significant reduction in physical activity might probe one to think about the adverse impacts the pandemic might have in the cardiac health of the average American. Hypertension, defined here as \hat{a} %¥140mmHg systolic or \hat{a} %¥ 90mmHg diastolic, is a very prevalent pathology in our population and can lead to devastating sequelae such as heart attack, stroke, kidney disease, and dementia. Looking specifically at hypertension management, some limitations to screening include lack of an available blood pressure cuff at home and missed follow-up visits with providers leading to non-renewal of anti-hypertensive medications. This investigation aims to retrospectively study how the pandemic impacted the incidence of hypertension in 2020 and understand what role telemedicine played in providing healthcare screenings to patients. We postulate that there is an increased incidence of hypertension in 2020, during the pandemic, compared to 2019, before the pandemic. Methods: Retrospective data was gathered via chart review of an urgent care telemedicine company on patients aged 18-65. 1,000 charts were de-identified, randomized, and stratified by prepandemic (July-December 2019) or pandemic (July-December 2020) periods. The incidence of hypertension was calculated per year. The criteria for hypertension included systolic pressure ≥140mmHg or diastolic blood pressure ≥90mmHg. A two-sample t-test with unequal variance was used to confirm significance. Results: Preliminary analysis, comparing 2019 pre-pandemic visits (n=500) with 2020 pandemic visits (n=232) showed a statistically significant increase in incidence of systolic (20% during the pandemic compared with 16% before the pandemic, p < 0.05) and diastolic (36% during the pandemic compared

with 26% before the pandemic, p< 0.05) blood pressure readings. Conclusion: Based on the increased number of hypertensive readings during 2020 compared to 2019, we conclude that there is a higher incidence of hypertension during the COVID-19 pandemic. This finding can be explained by multiple factors and requires further investigation. First, the pandemic severely restricted physical activity with jobs being lost or switched to virtual formats, forcing many to stay home. Second, unhealthy diets and increased caloric intake may have led to increased obesity. Lastly, lack of follow-up with physicians may have led to reduced hypertension screenings allowing more patients to have undiagnosed and untreated hypertension. Telemedicine is one avenue that may address these problems. This platform offers convenience in scheduling and attending appointments, therefore including younger populations that are often abandoned in early screenings. It has a wider reach that is not geographically bound and has the potential to reduce healthcare costs. We hope that this study raises further questions regarding the rise in hypertension during the pandemic and ways to increase early detection of preventable conditions.

Hormonal Contraceptive Use in Oncology Patients: Pharmacists Role in Counseling

Abstract ID: UNTHSC274 Research Area: Pharmacology Presenter: Jessica Obioma Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

Jessica Obioma

Abstract:

Objective: Over 70 million women in the United States are currently using a contraceptive method. In addition, there were 1.7 million new cancer cases reported in 2018. A concise and timely conversation about contraceptive options and use is pertinent to the care of a cancer patient. Some studies have shown concerns for hormonal contraceptive use in cancer patients. The primary objective of this systematic review was to evaluate evidence on effective hormonal contraceptive use in cancer patients. A second objective was to describe pharmacist counseling points for cancer patients. Methods: A systematic review of the literature was conducted from 1975 to 2022 using PubMed with keywords such as "contraceptive use,â€□ "oncology patients,â€□ "counseling,â€□ and "role of a pharmacist. $\hat{a} \in \Box$ A PRISMA flow diagram was used to analyze the process. Studies that did not meet the inclusion criteria of focusing on the effects of hormonal contraceptives in cancer patients and patient counseling were excluded. Articles were summarized in a table classified by the author, year published, title, study design, intervention, pros and cons of contraceptive methods, and major findings. The quality of the articles was assessed via the Oxford for Evidence-based Medicine scale. Results: Seventy-four articles were eligible for review. The majority of studies conducted were randomized clinical trials and comparative studies. Trends in literature have shown insufficient data in regard to medication counseling on the effects of hormonal contraceptive use in cancer patients. There are 6 classes of contraceptive methods: (1) behavioral methods, (2) barrier methods, (3) estrogencontaining methods, (4) progestin-only methods, (5) intrauterine devices (IUDs), and (6) surgical sterilization. Several studies suggest the copper IUD, a highly effective, reversible, long-acting, hormone-free method should be considered a first-line contraceptive option for women with a history of hormonally mediated cancer. Women with IUDs can undergo all forms of imaging, including computed tomography and magnetic resonance imaging. Conclusion: Hormonal contraceptives are one of the most prescribed medications in the United States which provide pharmacists the opportunities to counsel and practice through state protocol or collaborative practice agreements. While pharmacists are poised to provide this service, cancer patients represent a unique population to seek contraceptive advice

before and after treatment. As the pharmacist's scope of practice continues to expand, future research is needed to address the pros and cons of available contraceptives.

The influence of humidity and precipitation on skeletal morphological variation in East Asia

Abstract ID: UNTHSC272 Research Area: Structural Anatomy Presenter: Elizabeth Cho Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: Postdoctoral Fellow

Author(s):

- Elizabeth Cho
- Libby Cowgill
- Gregory Blomquist

Abstract:

Human ecogeographic proportions in Europe, Africa, and the Americas are well studied, but Asia remains underrepresented despite its diverse range of climates, latitudinal expanse, and long history of habitation. The monsoon is a significant environmental force across East Asia with two distinct phases: a summer phase and winter phase. The southwest winds of the summer component cross the equator bringing heavy rain during the warmer, humid months of the year while the winter's northeastern winds bring cold, dry air down from Siberia during the year's coldest months. Previous assessment of East Asian body form and minimum temperature during the monsoon's winter phase has found body size to conform with Bergmann's rule while limb length patterns did not follow Allen's rule. These analyses found that Southeast Asian are small overall, possibly due to the greater selective pressure of living in a humid climate which is exacerbated by the monsoon's heavy rain summer component. Reduction of body size in these populations could allow for better thermoregulation as the climate conditions of Southeast Asia are not conducive to heat dissipation via sweat evaporation. For this study, measurements throughout the body were gathered on female (N=439) and male (N=460) individuals from seven East Asian countries and represent 10 populations. Osteometric data and proportional indices were combined with appropriately matched autosomal SNP data, precipitation, and humidity data using linear mixed model analysis to evaluate the selective pressure of these climatic factors specifically associated with the summer phase of the monsoon. The influence of both climate variables was found to vary depending on the region of the body assessed. This further supports the need for ecogeographic research to assess the body as a whole and highlights the complexity of climatic adaptation.

Spatial Transcriptomics Reveal Potential Sex Differences in Supraoptic Nucleus Gene Expression of Adult Rats

Abstract ID: UNTHSC269 Research Area: Integrative Physiology Presenter: Dianna H. Nguyen Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: Dual Degree Student

Author(s):

- Dianna Nguyen
- Nicole Phillips
- Joseph Cunningham

Abstract:

Purpose: The supraoptic nucleus (SON) of the hypothalamus contains magnocellular neurosecretory cells that play a key role in the regulation of fluid and electrolyte homeostasis. Although there are many well-known sexually dimorphic regions of the hypothalamus, little is known about possible sex differences in gene expression in the SON. Our study aims to address this knowledge gap by leveraging spatially-resolved transcriptomics to better visualize gene expression profiles of cells in the SON of male and female rats and gain insight on their physiological functions without sacrificing morphological context. Methods: Visium Spatial Gene Expression (10x Genomics) was used to obtain spatially-resolved gene expression data for the SON of adult male (n=4) and female (n=4) Sprague-Dawley rats. Briefly, each brain was sectioned at $10\hat{I}$ /4m thickness to collect coronal sections (~4x4mm) containing the SON and other brain structures. Each section was then mounted on the capture areas of Visium slides containing probes that bind mRNA. Next, the sections underwent the following workflow: 1) sample staining and imaging, 2) cDNA library preparation, 3) sequencing, and 4) analysis/data visualization. Data were analyzed using 10x Genomics' Space Ranger and Loupe Browser applications and other bioinformatic tools. Results: Gene cluster analysis successfully differentiated myelinated fiber tracts from nuclei and identified several distinct neuronal populations in the coronal brain sections from both male and female rats. From the list of significant genes after performing differential expression analysis on the SON region via Loupe Browser, 22 genes (e.g., Avp and Oxt) were common to both sexes, 24 genes were unique to the females, and no genes were unique to the males. Gene Ontology (GO) Enrichment and pathway analyses revealed GO terms and pathways related to: 1) neurohypophyseal hormone activity, regulation of peptide hormone secretion, and regulation of ion transport for the significant genes common to both males and females and 2) endomembrane system and glycerophospholipid metabolism pathway for the significant genes unique to females, as some examples. Further interrogation of the significant genes with Ingenuity Pathway

Analysis showed some overlapping networks and common upstream regulators; however, differences between the male and female groups were also identified in upstream regulators, such as Creb, Pka, and LEPR unique to the males and insulin, Cdkal1, and HIF1A unique to the females. Conclusions: These spatially-resolved transcriptomic data suggest potential sex differences in SON gene expression that may be associated with basic endomembrane structure and function and phospholipid metabolism/signaling. Future spatial transcriptomic studies will investigate changes in SON gene expression that contribute to sex differences in cellular mechanisms involved in body fluid homeostasis and possibly pathophysiology.

Social Determinants of Health: Learner-integrated Outreach, Screening, and Intervention in a Primary Care Clinic

Abstract ID: UNTHSC267 Research Area: Community Medicine Presenter: Jevon Chu Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Jevon Chu
- Gayatri Kunchay
- Didi Ebert-Blackburn
- Maria Crompton

Abstract:

Introduction: Whether knowingly or unknowingly, clinical learners interact with factors in the social determinants of health model (SDoH) everyday; however, students often have tenuous grasps on identifying and managing these factors in clinical settings. These factors include education, employment, access to food and health care, neighborhoods and built environments, and social support networks. There is a growing recognition in primary care practices of the importance in educating students on treating patients' immediate health concerns and SDoH factors contributing to patients' presentations to improve health outcomes. At the Central Family Medicine (CFM) Clinic of the University of North Texas Health Science Center, clinical preceptors piloted the integration of SDoH resource navigation into clinical duties for students. Methods: In addition to traditional chart reviewing, students identified gaps in preventative screenings and SDoH needs. Patient encounters included administering the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE) questionnaire to assess SDoH needs. After the encounter, students followed up with patients, linked patients to resources based on the questionnaire results, and involved social work for complex SDoH needs. Finally, descriptive data analysis was conducted on the questionnaire results to provide insight into the leading SDoH needs at the CFM clinic compared to that of the state's. Qualitative data analysis was conducted on student feedback testimonials to provide guidance on identifying areas of strengths and weaknesses to determine future goals for clinical learners. Results: Education levels in the clinic patient population were lower than that of the state's, with 23.6% of the patients having less than a high school degree, compared to 14.3% of Texas residents. Similarly, the unemployment level of the patient population is almost 3 times that of the state. 12.1% of the patient population experienced food insecurity, compared to 14% of Texas residents. Trends in clinical learner testimonials included active engagement in the

process of addressing social needs, improved focused patient interviewing skills, and understanding the gravity of SDoH issues. Clinical learners found difficulty in conversing with SDoH resource representatives due to unfamiliarity with resource navigation and terminology. Conclusion: Based on the results from the PRAPARE questionnaire and student testimonials, there is a clear need for improving SDoH factors in the patient population, and for medical education to include SDoH training by involving students as a value-add to clinical operations in improving patients' health outcomes. With involvement in this work, students address the Accreditation Council for Graduate Medical Education competencies for family medicine in the domains of health promotion and wellness, advocacy, and physician role in healthcare systems. Future directions include recruiting clinical preceptors who promote training in using SDoH resources, a practice that is supported with financial incentives in recent policy, developing a toolkit for integration of students into preceptors' practices, and advocating for students to have clinical administrative time to work on patient care tasks that focus on improving SDoH.

Methionine Synthase: A target for novel small molecules to inhibit cocaine and methamphetamine induced neuronal death

Abstract ID: UNTHSC266 Research Area: Neuroscience Presenter: Olivia Young Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: GSBS Student

Author(s):

- Olivia Young
- Arlene Funk
- Biddut Deb nath
- Charles Amankwa
- Anila Chintagunta
- Sudershan Gondi
- Michael Forster
- Ritu Shetty
- Suchismita Acharya

Abstract:

Purpose: Oxidative stress-induced cell death is involved in the pathology of psychostimulant addiction neuropathies and ischemic stroke. These conditions potentially cause neuronal and functional changes via different mechanisms - epigenetic alterations (DNA hypomethylation) and reactive oxygen species (ROS) accumulation. Current medications for the treatment of psychostimulants (e.g., cocaine and methamphetamine) induced addiction neuropathies are largely ineffective due to the high rate of relapse and marginal alterations of dependency to these diseases. To circumvent this, our laboratory has synthesized novel hybrid antioxidant small molecules: SA-30 and SA-31, with predictive neuroprotective and broad-spectrum reactive oxygen species (ROS) scavenging abilities in mouse hippocampal HT22 neural cells. Our objective here was to test if the compounds increase cell proliferation, superoxide dismutase (SOD) enzyme, as well as methionine synthase (MS) enzyme, a key enzyme largely responsible for DNA methylation, neuronal growth, and survival using human neuroblastoma cells (SH-SY5Y) expressing dopaminergic neurons. Methods: The synthesis and structure characterization of compounds SA-30 and SA-31 were previously synthesized in Acharya lab using nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. Human neuroblastoma cells SH-SY5Y expressing dopaminergic neurons were purchased (ATCC), cultured, and treated with different concentrations of cocaine hydrochloride or methamphetamine for 8, 24, and 48h for determining EC50 using MTT assay. In the next experiment, either cocaine hydrochloride (1.5mM) or Methamphetamine

(METH, 3.5 mM) was added followed by co-treatment with compounds SA-30 and SA-31 and 4-hydroxy tempol (all at 100µM) for 24 hours. Cell viability was assessed using MTT assay. The level of intracellular MS and SOD enzymes was assessed using ELISA. Results: In SHSY5Y cells, the EC50 of cocaine was 1.5 mM, and for METH was 3.5 mM after 24h of treatment. Both compounds SA-30 and SA-31 were not cytotoxic at varying concentrations (0.01, 0.1, 1, 10, 100µM) and rescued cells from both cocaine and METH-induced oxidative stress/cell death at 100µM concentrations. SA-31 at 100µM significantly increased (~1.5 fold) intracellular MS as compared to control. There was a decrease in MS level after METH treatment and treatment with SA-30 and SA-31 increased the level. SOD levels were significantly higher (\sim 3 fold) in METH+SA-31 treated groups than only METH groups. Conclusion: Both novel hybrid small molecules SA-30 and SA-31 are neuroprotective in SH-SY5Y cells from psychostimulants cocaine and METH-induced oxidative stress/neural cell death. Increasing MS and SOD enzyme activities is one of the mechanisms by which neuroprotection was attained. Future studies will address the potential of both SA-30 and SA-31 to progress further in pre-clinical drug development, with a future application for the treatment of substance abuse disorder.

Characterization of Echocardiogram, Peritoneal Fluid, and Transjugular Liver Biopsy Assessment in Patients With Noncirrhotic Cardiogenic vs. Nephrogenic Ascites

Abstract ID: UNTHSC265 Research Area: General Medicine Presenter: Areeba Khwaja Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

• Areeba Khwaja

Abstract:

Purpose: Patients with heart failure (HF) may present with cardiogenic ascites in the absence of cirrhosis. Likewise, patients with end-stage renal disease (ERSD) on hemodialysis (HD) may develop nephrogenic ascites in the absence of cirrhosis. In many cases, these patients are assumed to have underlying portal hypertension. However, onset of ascites in ESRD patients on HD could instead be cardiogenic in nature as a result of rightsided HF. Peritoneal fluid analyses, echocardiogram, and transjugular (TJ) liver biopsy with hepatic venous pressure gradient (HVPG) may more accurately define etiology and clinical disease status of noncirrhotic ascites in both these patient cohorts. Methods: A retrospective comparative analysis of two non-cirrhotic cohorts: (1) Patients with HF and ascites (cardiogenic ascites) and (2) Patients with ESRD and ascites was done from 2014 to 2021 at a high-volume academic hospital with a liver transplant program. The identified etiologies of cardiogenic ascites included ischemic, non-ischemic, pulmonary hypertension, and valvular heart disease in patients with histology consistent with passive hepatic congestion and corresponding clinical history/evaluation of HF and ascites. Patients with ESRD on HD who presented with new-onset ascites were also included. Both cohorts were assessed by three measures, including echocardiography, peritoneal fluid analysis, and TJ liver biopsies. Results: Of the 29 non-cirrhotic patients included in analysis, 10 had cardiogenic ascites and 19 had ESRD with ascites. Patients were confirmed to have no cirrhosis by histology; 55% exhibited only minimal hepatic fibrosis (stage < 2). Sinusoidal dilation was present in 21/29 (72%) of patients overall, including 90% in the cardiogenic group and 63% in ESRD (p=NS). On echocardiogram, a larger proportion of patients with cardiogenic ascites had reduced right ventricular systolic function (89% vs. 41%, p=0.04). Peritoneal fluid analysis revealed serum-ascites albumin gradient (SAAG) was higher among those with cardiogenic ascites (1.65, 0.6-2.4) vs. ESRD (0.9, 0.4- 4.0; p=0.005), such that cardiogenic ascites was more likely associated with high SAAG >1.1 (80%) while ESRD was more likely to have low SAAG (79%; p=0.004). Peritoneal fluid protein was higher in ESRD (4.3, 3.0-5.8 g/dL) vs. cardiogenic ascites (3.3, 2.0-4.6 g/dL; p=0.002). TJ hepatic venous pressure gradient

(HVPG) was performed in 27/29 (93%) patients. Patients with cardiogenic ascites had significantly elevated free hepatic vein pressure (22, 11-54 mmHg) vs. (12, 2-29 mmHg; p=0.01) and wedged hepatic vein pressure (24, 11-57 mmHg) vs. (14, 3-32 mmHg; p=0.03) compared with ESRD. Conclusion: Although patients with cardiogenic ascites exhibited elevated protein, SAAG, and both free and wedged hepatic vein pressures by TJ assessment compared to the ESRD cohort, evidence of right-sided HF was still present on echocardiogram in multiple patients of the ESRD cohort. Therefore, further characterization of hemodynamic, histologic, and advanced echocardiographic features, especially in a larger cohort size, may help improve our understanding of stratifying the risks of HF severity/prognosis as well as the etiology of nephrogenic ascites and how frequently it actually occurs without any true underlying evidence of HF.

The Role of Oxidative Phosphorylation in MÃ¹/₄ller Glia Functions and Survival

Abstract ID: UNTHSC263 Research Area: Eye / Vision Presenter: Nana Yaa Nsiah Submission Type: Competition Poster Department: North Texas Eye Research Institute Classification: GSBS Student

Author(s):

- Nana Yaa Nsiah
- Denise Inman

Abstract:

Purpose The importance of mitochondria to the energy production of $M\tilde{A}^{1/4}$ ller glia (MG), the main glial cells of the retina, is controversial. Previous studies showed MG are mainly glycolytic. Others challenge this view because MG are deficient in key glycolytic enzymes. Our goal is to potentially settle this debate by destabilizing the electron transport chain in MG mitochondria and assessing how retinal metabolism may be impacted. Methods MG that lack oxidative phosphorylation in vivo through destabilization of Complex IV were generated using GLASTCreERT2::Cox10fl/fl transgenic mice. Mice received daily tamoxifen injections for 5 consecutive days beginning at P30. Confirmation of recombination of the floxed Cox10 locus and enzyme activity was performed using PCR analysis of genomic DNA isolated from the retina and sequential cytochrome c oxidase (COX)/succinate dehydrogenase (SDH) histochemistry, respectively. Cell lysates from primary Müller cells were used for western blotting and total protein analysis. Full-field electroretinography (ERG) was performed to assess MG function from transgenic and wild-type mice in vivo. Scotopic ERGs were recorded (OcuScience® HMsERG, Xenotec Inc., Henderson, NV) in response to six light flash intensities ranging from \hat{a} '3 to 1 log cd x s/m2 on a dark background. Each stimulus was presented in a series of three. Data were analyzed with GraphPad Prism and ERG bwave amplitudes were compared using a paired two-tailed Student's t-test. The b-wave amplitude was measured from the trough of the a-wave to the peak of the b-wave. Results A 465bp DNA fragment amplified from genomic DNA of mutant mice, with no corresponding fragment from control, confirmed Cox10 locus recombination. Total protein analysis, with normalization to the mitochondrial protein VDAC1, showed lower levels of cytochrome c oxidase protein from mutant mice compared to controls. Scotopic ERG b-wave was not significantly different between mutant and wild-type age-controlled mice at all light intensities. No overt retinal abnormalities were observed in GLASTCreERT2::Cox10fl/fl transgenic mice. Conclusion Our results show that cre recombinase induction in GLASTCreERT2::Cox10fl/fl successfully inhibits cytochrome c oxidase activity in MG from

adult mice. Our in vivo experiments suggest that oxidative phosphorylation is not necessary for Müller glia energy metabolism under physiological conditions.

Physical Therapy Telerehabilitation on COVID-19 Patients - A Literature Review

Abstract ID: UNTHSC262 Research Area: Rehabilitative Sciences Presenter: Valeria Galvan Submission Type: Competition Poster Department: School of Health Professions: Physical Therapy Classification: School of Health Professions Student

Author(s):

- Valeria Galvan Godines
- Melissa Vasquez
- Yuzek Rodriguez
- Karyna Valencia

Abstract:

Introduction: The impact of Covid-19 has revolutionized how Physical Therapists provide treatment to patients to reduce the risk of infection, since most rehabilitation is done in close proximity, social distancing has been the main challenge when providing treatment. For physical therapy rehabilitation, it is imperative to provide treatment that still focuses on the recovery of function, strength, and movement of the patient. It is necessary to explore what are the best ways of implementation to maximize the patients' benefit. The purpose of this literature review is to analyze studies that focused on physical therapy through telehealth and the overall outcome of these visits. Methods: This review utilized randomized control trials and systematic reviews of various populations and settings using the following search terms: Telemedicine, Telehealth, Telerehabilitation, Covid-19, Physical therapy. All articles are dated within the past 2 years from PubMed, Scopus, and Google scholar. This literature review examines the effectiveness of telehealth in the era of Covid-19. Results: The population analyzed in these studies varied from infants to older adults. Results varied on each study, but all concluded with advantages and disadvantages of Physical Therapy Telerehabilitation. The main advantages were reducing travel fatigue, the general strain on the body, and minimizing travel cost. Some of the disadvantages found were the adaptability of both patient and therapist to limited treatment options, technological barriers, and reduction in equipment accessibility. Out of all the therapy sessions provided, 85% were telerehabilitation sessions, of which 94% out of those had to follow ups and patients expressed being at least satisfied with the service. Women participated more frequently and reported a higher level of satisfaction than male participants. A consensus was made and reported that 92% of the patients that participated in the telerehabilitation sessions were willing to continue with this practice. Overall physical therapy increases clinical effectiveness, functionality, quality of life, and user satisfaction. For patients recovering from COVID-19, telerehabilitation improves their vital respiratory capacity,

increases respiratory muscle efficiency, and decreases fatigability levels. Conclusions: Physical Therapists recognize the value in training for virtual treatment delivery and continue to provide specialized rehabilitation services with new technical and clinical skills. Telehealth systems are the solution for the shortage of hospital beds and their home-based style can provide clinical benefits, cost-effectiveness, and simplicity. The implementation of telehealth services has been feasible and acceptable with the support of policy in favor of the expansion of telehealth physical therapy. The telehealth models now available globally are proving that telerehab is not inferior to standard rehabilitation. Clinical Relevance: Telemedicine services provide essential care for patients without increasing the risk of Covid-19 spread. Although it has some challenges, it is most accessible throughout all health care practices and has the potential to shape the future of the patient provider relationship, especially for physical therapy.
Designing a study to examine acute cross-over effects of lower limb muscle fatigue during upright standing

Abstract ID: UNTHSC261 Research Area: Other Presenter: Anton Agana Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Anton Agana
- Kuanting Chen
- Adam King

Abstract:

Research Question: Are there acute cross-over effects of lower limb muscle fatigue on movement strategies of young adults during upright standing? Background: Our study will make use of three major concepts: the cross-education phenomenon, muscle fatigue, and postural control. The cross-education phenomenon is a theory that dates as far back as 1898 in which it was first coined by Walter Davis in his work and it pertains to the effects of training one side of the body to the untrained contralateral or opposite side. Crosseducation experiments have since been expanding in various other aspects of physiology, such as its effects in strength training, muscle size preservation, hip flexor stretching, speed of voluntary effort, and flexibility to name a few. Looking at these various research studies, we can see evidence of cross-education phenomenon in various physiological aspects regardless if it's upper extremity or lower extremity. This leads us to ask if cross-education can be seen in movement strategies and postural control as well. Muscle fatigue, our second concept, is the decrease in maximal force as a response to contractile activity. It can be described in various ways, such as central vs peripheral or global vs local. Finally, Postural control is the ability to control one's body position in space for stability and orientation. Simply put, it is the ability to be able to maintain upright standing. Looking at these three componentsâ€"the cross-education phenomenon, muscle fatigue, and postural controlâ \in "that have been studied over the last century, we have developed a research idea that uses the influence these three have on each other. Our research will generate a quantitative analysis of the cross-educational phenomenon on postural control by observing contralateral muscle fatigue. Materials and Methods: Twenty individuals are expected to enroll in the study. Participants will be healthy young (18-35 years old) adults, with no known balance disorder, neuromuscular disorder/impairment, or lower extremity injuries. Postural control data will be collected with a force plate. Participants will perform pre- and post-fatigue balance tasks on a force plate that includes single-legged standing with variations of the right and left foot and stable and unstable surface types. Following initial

balance assessment a fatigue task of single leg standing calf raises will be performed until exhaustion. Data from pre-fatigue balance tasks and post-fatigue balance tasks will be analyzed and compared. Anticipated Results, Conclusions, and Impact: We anticipate that acute fatiguability on one of the lower limbs in our subjects will influence contralateral postural stability and control during upright standing. We expect this to be supported objectively by measurements of the muscle activity from the force plate device. As for impact, we want to increase our understanding on postural control training through crosseducation and be able to provide evidence via objective data. We also hope this study can provide new insight for various applications, such as physical rehabilitation or performance training.

Bilateral Seminal Vesicle Hypoplasia

Abstract ID: UNTHSC260 Research Area: Structural Anatomy Presenter: Daniel Cabrero Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Kerrie Brown
- Carter Butson
- Daniel Cabrero
- Kathryn Costello
- Alliana Detorio
- Cara Fisher

Abstract:

Background: Seminal vesicles, two coiled sacs located posteriorly to the male bladder and lateral to the ampulla of the ductus deferens, play a vital role in male fertility. The duct of the seminal vesicle joins with the ampulla of the ductus deferens forming the ejaculatory duct, which then opens into the prostatic urethra. Producing about 70% of male semen, the seminal gland secretes alkaline fluid that contains fructose, prostaglandins, proseminogelin, and other substances that aid in successful fertilization. Contraction of the seminal vesicles releases seminal fluid into the ejaculatory duct where it mixes with spermatozoa from the ductus deferens. Little to no secretions from the seminal vesicles would likely result in male infertility due to the absence of fructose, the primary energy source for motile spermatozoa. Seminal vesicles can be affected by infection, cysts, tumors, hypoplasia, and congenital disease, but isolated seminal vesicle abnormalities are a very uncommon occurrence. There are a few disease states in which seminal vesicle abnormalities do occur. For example, Zinner syndrome is associated with renal agenesis and seminal vesicle hypoplasia or cysts. A Hoxa 13 gene mutation is associated with reduced seminal vesicle size and abnormal morphology, diminished dorsolateral ductal branching of the prostate, and agenesis of the bulbourethral gland. The complete bilateral absence of seminal vesicles can occur following a radical prostatectomy, where the prostate and seminal vesicles are excised together. Case Information: A pelvic dissection of an 82-year-old male donor during a first-year medical anatomy course revealed bilateral seminal vesicle hypoplasia. The seminal vesicle tissue was abnormally tough and embedded within enlarged prostatic tissue. The ductus deferens appeared normal and bilaterally intact. No other significant abnormalities in the reproductive tract nor the kidneys were noted. Conclusions: Based on our current research and ideas, seminal vesicle hypoplasia with no other concurrent reproductive abnormalities is unusual. Apart from the small seminal vesicles, our cadaver had a complete, bilateral set of male

internal reproductive organs and an enlarged prostate with no signs of cancer treatment, ruling out the possibility of radical prostatectomy. Due to the presence of an intact urinary tract, Zinner syndrome is unlikely. The most promising possibility for this abnormality is a mutation of the Hoxa 13 gene based on the similarities between this mutation's presentation and our findings.

Presentation and Diagnosis of Phosphoglucomutase Deficiency Type I in a Pediatric Patient

Abstract ID: UNTHSC259 Research Area: Pediatrics & Women's Health Presenter: Cori Steele Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (4th Year)

Author(s):

- Cori Steele
- Pete Leahy

Abstract:

Background: Phosphoglucomutase deficiency type 1 (PGM1) is a subtype of congenital disorders of glycosylation (CDG). The type of CDG a patient has is dependent on the gene involved. There are over 130 different types of CDGs, and the defect results in abnormal levels of glucose and galactose metabolites. The diagnosis of CDGs is made by a variety of specialized tests including DNA sequencing, transferrin isoform analysis, or isoelectric focusing. Most CDGs have no direct treatment, but certain disorders have existing therapy and others are in development. It is important to consider CDG in the evaluation of patients who have involvement of multiple organ systems given the potentially treatable nature of these disorders, and the overlap with other disorders. Case Information: We present a patient with phosphoglucomutase (PGM1) deficiency who presented with hypoglycemia and elevated liver function tests. Clinical features of PGM1-CDG involve severe liver and muscle impairment, hypoglycemia, cardiomyopathy, coagulopathies, endocrine and metabolic disorders, neurocognitive delays, and craniofacial abnormalities (cleft palate, bifid uvula, and micrognathia). Abnormal protein glycosylation produces these characteristics, and recurrent hypoglycemia occurs due to insufficient glycogen mobilization. Conclusions: We provide a thorough case history and then discuss the pathophysiology, clinical features, diagnosis, evaluation, and management of PGM1 deficiency. A summary of clinical trial data on the use of galactose supplementation in this rare disorder is provided as is a decision tree in the work-up of hypoglycemia.

Biological Characteristics of Lens Epithelial Cells from Grx1 and Grx2 Double Knockout Mice

Abstract ID: UNTHSC258 Research Area: Eye / Vision Presenter: Jinmin Zhang Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: GSBS Student

Author(s):

- Jinmin Zhang
- Yu Yu
- Kevin Lal
- Terry Dang
- Chimdindu Ezugwu
- Myhoa Tran
- Hongli Wu

Abstract:

Purpose: Glutaredoxins are glutathione (GSH) dependent enzymes that play an important role in repairing oxidized proteins, preventing subsequent protein misfolding and disrupting protein aggregation. The Grx system has two major isozymes: glutaredoxin 1 (Grx1) and the recently discovered glutaredoxin 2 (Grx2). To achieve a comprehensive understanding of the Grx system in the lens, our lab recently created a Grx1 and Grx2 double knockout (DKO) mouse model to observe how the double deletion of the enzymes may affect the lens epithelial cell (LEC) survival and lens transparency. Methods: Primary LECs were cultured from wild-type (WT) and DKO mice. Cell proliferation was tested via various assay kits, and cell cycle distribution was evaluated using flow cytometry analysis. Cell apoptotic markers including Bcl-2, Bax, and caspase 3 were detected using Western Blot. The mitochondrial function was evaluated via ATP concentration. Cytoskeletal arrangement and its intercellular connection were also examined by using fluorescent microscopy. Results: Compared to WT cells, DKO cells displayed a much slower growth. The number of DKO cells arrested in the M phase was twofold higher than that of WT cells. The population of DKO cells arrested in the S phase was 50% less than that of WT cells. For the apoptotic pathway, we found DKO cells have higher levels of Bax and cytochrome c with lower ATP production. Furthermore, we also found that DKO cells had higher levels of vimentin expression, which may lead to cytoskeleton reorganization and polarity. Conclusions: In conclusion, our data suggest that Grx function loss may inhibit cell proliferation, disrupt the normal cell cycle, trigger apoptosis pathway, and damage mitochondrial functions.

Three Pediatric Siblings With CADASIL

Abstract ID: UNTHSC257 Research Area: General Medicine Presenter: Kate Russell Submission Type: Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Katherine Russell
- Nehel Kurjee

Abstract:

BACKGROUND: Cerebral autosomal-dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is a congenital small vessel disease of the brain due to NOTCH3 gene mutations. Although adult-onset CADASIL is well documented, more cases are being described within the pediatric population. We describe 3 siblings with NOTCH3 mutations with various symptomatic presentations of early-onset CADASIL and 1 sibling with concurrent moyamoya syndrome. PATIENT PRESENTATIONS: A 19-year-old male who has experienced behavioral dysregulation, hallucinations, and memory loss along with a hyperintense signal abnormality in his temporal lobe. His 15-year-old sister who has the mildest presentation in terms of normal imaging results but experiences severe headaches, anxiety, and depression. And the youngest sibling, a 13-year-old with first reported case of a NOTCH3 mutation associated with moyamoya syndrome and a TREX1 gene mutation of uncertain clinical significance. She had multiple strokes before 5 years of age. CONCLUSION: Our set of siblings share many similarities with other reported pediatric cases of CADASIL, all with NOTCH3 gene mutations and with early onset symptoms that range from abnormalities in the cognitive/behavioral/psychiatric field to neurological deficits, migraines, and strokes. Gene testing and imaging studies in symptomatic children with a family history suggestive of CADASIL might aid in early diagnosis even though there is no effective therapy. We believe that the correlation of clinical presentations and gene mutations together with increased research into the molecular mechanisms underlying CADASIL (and related arteriopathies such as moyamoya syndrome) are critical to the eventual development of targeted therapies.

NK-cell target immunotherapy for Hepatocellular carcinoma (HCC)

Abstract ID: UNTHSC256 Research Area: Immunology Presenter: Michaela Allison Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Michaela Allison
- Stephen Mathew
- Porunelloor Mathew Mathew
- Luke Cooksey

Abstract:

Natural killer (NK) cell immunotherapies have recently been gaining traction for treatment of both hematological and solid tumors due to their innate anti-tumor characteristics. NK cell activity is characterized by a balance of activating and inhibitory receptor interactions rather than antigen recognition, rendering this innate lymphoid cell a promising therapeutic target that does not rely on prior sensitization. Immunotherapies focused on targeting NK cell activity in the form of adoptive transfer, immune checkpoint inhibitors (ICIs) and chimeric antigen receptor (CAR) NK cells have shown some success in combating immunosuppressive effects seen during cancer. Significant suppression of NK cells has been identified in the most common type of liver cancer, hepatocellular carcinoma (HCC). NK cells play a pivotal role in the liver by early recognition and lysis of virally infected and cancerous cells introduced through portal circulation and unsurprisingly, dysfunction of this immune cell subset due to the hypoxic HCC microenvironment has been implicated as strongly correlated with poorer prognosis and decreased survival of HCC patients. Research investigating the effects of NK cell suppression has indicated that targeting NK cell suppressive interactions mediates increased lysis of HCC cells. Our research has shown the upregulation of immunosuppressive NK cell ligands on HCC cells that could potentially lead to immune escape mechanisms in HCC cells. Research further elucidating receptor-ligand interactions involved in suppression of NK cell activity during HCC could provide insight into potential therapeutic targets for patients who are untreatable with conventional therapies.

Outcomes Associated with Various Iterations of The Dedicated Orthopaedic Trauma Room

Abstract ID: UNTHSC253 Research Area: General Medicine Presenter: Kathryn Biddle Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

• Kathryn Biddle

Abstract:

Purpose: Scheduling urgent, orthopaedic trauma cases has long been a challenge for health care institutions. Traditionally, these cases are scheduled for an operating room (OR) slot in the middle of the night, by "bumpingâ $\in \Box$ elective cases to later in the day, by adding a case on after-hours, or by delaying the case for several days until an OR becomes available. As a solution to the challenges facing traditional scheduling modules, trauma centers around the country have instituted the use of a dedicated orthopaedic trauma room (DOTR). While there are multiple studies analyzing the effects of DOTRs on various outcomes, there is not a centralized review of these studies. This paper will serve as a review of the various models of the DOTR as well as the effect of the DOTR on after-hours procedures, time to surgery (TTS), duration of surgery (DOS), length of stay (LOS), cost, and surgical complications. Methods: An extensive review of the literature was performed through PubMed and Embase. Studies were included in the review if they were published in English, involved clinical research, and reported the use of a dedicated operating room at a regular interval throughout the week, specifically for orthopaedic trauma. 15 studies were found to meet the eligibility criteria. Results: We found a decrease across all studies measuring incidence of after-hours procedures before and after the implementation of a DOTR. Regarding mean TTS after the implementation of a DOTR, 3 out of 11 studies found a statistically significant decrease, 3 out of 11 studies found a statistically significant increase, and 5 out of 11 studies found no significant difference. Regarding mean DOS after the implementation of a DOTR, 2 out of 9 studies found a statistically significant decrease, 1 out of 9 studies found a statistically significant increase, and 6 out of 9 studies found no significant difference. Regarding mean LOS after the implementation of a DOTR, 6 out of 12 studies found a statistically significant decrease, 1 out of 12 studies found a statistically significant increase, and 5 out of 12 studies found no significant difference. Multiple studies reported financial outcomes favoring the DOTR. In addition, multiple studies reported favorable findings after the implementation of a DOTR regarding decreased mortality, unplanned reoperations, and postoperative ICU admission. Conclusions: This review suggests that DOTRs have a significant effect on decreasing the number of after hour procedures, decreasing cost, and

decreasing morbidity and mortality of orthopaedic trauma patients. There is variability in the data regarding the effect on time to surgery, duration of surgery, and length of stay.

Flood Syndrome in a Patient with Decompensated Liver Cirrhosis: A Case Report

Abstract ID: UNTHSC251 Research Area: General Medicine Presenter: Julia Janecki Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (3rd Year)

Author(s):

- Julia Janecki
- Natalie Vidal
- Joyce Roy
- Menalee Hapuarachchi
- Long Hoang

Abstract:

Background: Cirrhotic patients with ascites have a 20% risk of umbilical hernia development during the course of their disease due to elevated intra-abdominal pressures. In rare cases, patients with large volume ascites may develop a spontaneous umbilical hernia rupture leading to a sudden rush of ascitic fluid through a skin lesion, a complication known as Flood syndrome. The development of Flood syndrome is often provoked by local trauma or sudden rise in intra-abdominal pressure such as coughing, straining, vomiting, heavy lifting, or large volume ascites. Complications of a ruptured umbilical hernia include bowel incarceration, cellulitis, peritonitis, evisceration of the small bowel, and eventually sepsis. In this case report, we present the unique case of a patient with decompensated liver cirrhosis complicated by Flood syndrome. Case information: We present the case of a 56 year old male with a past medical history of decompensated cirrhosis secondary to alcoholism/chronic Hepatitis C infection complicated by ascites and hepatic encephalopathy, and chronic kidney disease of unknown stage, who presented to the ED with spontaneous leakage of fluid from his umbilical hernia. Emergent paracentesis expelled a total of 12 L milky fluid in a stream from his umbilicus and the patient was medically managed with IV albumin. Peritoneal fluid analysis revealed glucose of 144, WBC of 152, fluid protein of 1.4, and elevated triglycerides of 843, suggesting chylous ascites. A fluid serum ascites albumin gradient (SAAG) of 3 and fluid protein of 1.4 suggested the etiology was primarily cirrhosis complicated by portal hypertension. Following paracentesis, his ascites did not recur. His kidney function declined and he developed hepatorenal syndrome, deeming him a poor candidate for surgical intervention of his umbilical hernia. Conclusions: Flood syndrome is a rare complication of refractory ascites and liver cirrhosis, with a significant morbidity and mortality rate of 30%. Rupture prevention is dependent on the optimal management of underlying ascites with conventional strategies that includes diuretics, regular paracentesis,

avoidance of alcohol/non-steroidal inflammatory drugs along with dietary salt and fluid restriction. Due to the complexity of syndrome, surgical treatment is not a well-established procedure and is associated with a mortality rate of up to 30%, especially in patients undergoing emergent hernia repair.

Optimizing Preservation Solutions for Hypothermic Machine-Perfused Porcine Kidneys

Abstract ID: UNTHSC250 Research Area: Integrative Physiology Presenter: Katherine Ramos Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Katherine Ramos
- Michael Wade
- Arthur Williams
- Robert Mallet
- Albert Yurvati

Abstract:

Background: With the mounting incidence of hypertension, type 2 diabetes and other risk factors, end-stage renal disease (ESRD) is increasingly prevalent in the U.S. and worldwide, especially among racial minorities including Hispanics and African Americans. Kidney transplant is the most effective treatment for ESRD, but the supply of transplantable kidneys is inadequate to meet the increasing demand. Before transplantation, kidneys from deceased donors are maintained in a device (LifePort) that pumps ice-cold preservation solution through the organ. Although this hypothermic machine perfusion (HMP) is the most effective kidney preservation method available, kidneys from deceased donors often fail to resume function after transplant, especially when HMP is prolonged. Consequently, any kidneys not transplanted within 30 hours of harvest are discarded. We propose that optimizing the composition of the preservation solution may prevent post-transplant kidney failure and thereby improve kidney transplant outcomes, and potentially extend the useful lifespan of explanted kidneys beyond 30 hours, thereby increasing the pool of available kidneys for transplant. Hypothesis: Hypothermic perfusion of kidneys with solutions containing pyruvate, an energy substrate, anti-oxidant and anti-inflammatory compound, will better maintain perfusion flow and lower vascular resistance, indicating improved stability of the explanted organs. Methods: Kidneys obtained from thirteen anesthetized female Yorkshire pigs were fluid-flushed and then perfused for 72 h with modified, cold (2-4ï,°C) Ringer's solution containing 20 mM glucose, 30 mM mannitol, 50 g/l hydroxyethyl starch i, ± 20 mM pyruvate in a LifePort organ preservation device while flow and renal vascular resistance were monitored and recorded. Results: Kidneys maintained adequate perfusion for 72 hours despite a 50 ï,± 4% (mean ï,± SEM) increase in kidney mass indicating edema. Flows plateaued within the first 6 hours of perfusion and then declined slowly with prolonged perfusion. At 6 h perfusion, flows (ml/ming) were 0.54 i, ± 0.06 in

kidneys receiving control solution, and 0.61 ï, \pm 0.06 in kidneys perfused with pyruvateenriched solution. At 24 and 72 h, flows were 0.49 ï, \pm 0.06 and 0.38 ï, \pm 0.04 in the control kidneys, and 0.49 ï, \pm 0.03 and 0.37 ï, \pm 0.02 in the kidneys perfused with pyruvate enriched solution, respectively. The increases in mass of the control (52ï, \pm 4%) and pyruvate (46ï, \pm 6%) over 72 h perfusion did not differ. Conclusions: Pyruvate augmentation of preservation solution did not affect hypothermic kidney perfusion. The possibilities that pyruvate may affect the kidney's energy and/or antioxidant metabolism without altering organ perfusion or edema, and that measures limiting edema could improve kidney perfusion during HMP, remain to be tested.

Inhibitor of MyoD family isoform a (I-mfa) regulates contractile function of glomerular mesangial cells and glomerular filtration rate

Abstract ID: UNTHSC249 Research Area: Integrative Physiology Presenter: Garland Siebert Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (1st Year)

Author(s):

- Garland Siebert
- Garland Siebert
- Parisa Yazdizadeh Shotorbani
- Yu Tao
- Zheng Chen
- Rong Ma

Abstract:

Purpose: Glomerular filtration is a critical process for maintaining homeostasis of body fluid volume. This process in kidney is regulated by multiple factors inside glomeruli, including the surface area of the glomerular filtration membrane available for filtration. Glomerular mesangial cells (MCs) sit among the networks of glomerular capillaries and regulate glomerular filtration rate (GFR) by changing the surface area of filtration membrane through their contractile function. Inhibitor of MyoD family isoform a (I-mfa) was initially found as a transcription modulator. We recently found that I-mfa was present in MCs. However, the function of this protein in MCs is not known. The aim of this study was to examine if I-mfa regulated contractile response of MCs and GFR. Methods: Experiments were carried out in cultured human MCs and mice. In cultured cells, we examined the contractile function of MCs with and without overexpressing or knocking down I-mfa. I-mfa was overexpressed by transfecting MCs with I-mfa expression plasmids and the no functional I-mfb expression plasmids were used as the control. I-mfa was knocked down using siRNA approach and scramble siRNA was used as the control. MC contraction was evaluated by reduction of planar surface area of the cells in response to Ang II (1 $\hat{A}\mu M$) at different time points (10 -60 min) after treatment. In animal study, we assessed glomerular filtration function in Imfa+/+ (control) and I-mfa-/- mice (male at age of 12 weeks) using transdermal GFR measurement. Using this approach, we measured GFR by transcutaneous measurement of the elimination kinetics of the fluorescent renal marker FITC-sinistrin under conscious and freely moving conditions. Results: In cultured human MCs, Ang II (1 $\hat{A}\mu M$, 60 min) induced \sim 45% decrease in the planar surface area. This contractile response was significantly enhanced in MCs with I-mfa knocked down, but not in MCs treated with scramble siRNA.

Furthermore, the Ang II-stimulated contraction was significantly blunted in MCs with overexpression of I-mfa, but not with overexpression of I-mfb. Consistent with the in vitro experiments, deletion of I-mfa (I-mfa-/-) significantly decreased GFR compared to I-mfa+/+ mice (control) (1351.4 ű51.9 vs. 890 ű166.9, P < 0.05, n= 7 vs. 4, I-mfa+/+ vs. I-mfa-/-). Conclusion: This study suggests that I-mfa inhibits the contractile response of MCs and promotes glomerular filtration function.

Atypical Presentation of Focal Dystonia in Female Bassoonist: A Case Study

Abstract ID: UNTHSC248 Research Area: Physical Medicine / OMM Presenter: Samar Taqvi Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Samar Taqvi
- Yein Lee

Abstract:

Background: Focal dystonia is a disorder characterized by sustained or intermittent muscle contractions causing abnormal or repetitive movements. Musicians dystonia is focal taskspecific dystonia (FTSD) elicited in professional musicians during instrumental playing. Approximately 1% of all professional musicians develop musician's dystonia. Demographically, male musicians tend to be affected more than women, with a male: female ratio of 4:1. Embouchure dystonia falls under the category of FTSD that affects the jaw or tongue in musicians that play woodwind instruments such as oboe, clarinet, bassoon, and flute. The purpose of this case study is to highlight an unusual presentation of focal dystonia. Case Information: We present this case of a 74-year-old female bassoonist with a clinical presentation of jaw weakness and tremor. The patient reported that the symptoms only occurred when she played her instrument. The patient's past medical history includes TMJ and rheumatoid arthritis. Physical exam findings revealed a contraction of the muscles of facial expression accompanied by small tremor-like movements of the chin when playing the bassoon. EMG/NCS studies were ordered along with MRI, which incidentally showed vestibular schwannoma. Although unrelated to the patient's symptoms, a referral was made to otolaryngology. With normal EMG results, a trial of propranolol was initiated with a concern of possible essential tremor, but patient failed to respond to the medicine. Due to the task-specific nature of the patient's symptoms, occurring only when she plays, we initiated a multidisciplinary treatment plan for focal dystonia. The patient was referred to a speech-language pathologist, and we started several home exercises to help with the movement disorder. In addition, the patient was suggested to start movement-based therapies such as the Alexander technique, yoga, and Feldenkrais. The patient was also offered counseling to help her process this serious diagnosis that can dramatically affect a musician's career. The patient also had significant joint and myofascial pain which was treated with osteopathic manipulative treatment and trigger point injections. Conclusions: This case presents an embouchure dystonia that is atypical. Our patient did not fit the typical clinical picture of young, male musician complaining of unwanted movements. While

task specific, her movements mimicked essential tremor at times, not to mention other rheumatologic and musculoskeletal conditions such as degenerative joint disease and myofascial pain that contributed to the chief complaint. With the incidental findings of vestibular schwannoma, her diagnostic process was complicated as well. This case highlights the importance of including FTSD on the differential for any musician that presents to the clinic with a complaint of unwanted movements, weakness or tremor regardless of past medical history, age, and gender. Although unclear at initial presentation, with careful history, physical examination, and appropriate diagnostic tests, our team was able to arrive at the correct diagnosis and initiate appropriate treatment.

Assessing the acceptability and perceived effectiveness of disposable holding chambers among school health staff responding to students in respiratory distress

Abstract ID: UNTHSC247 Research Area: Pediatrics & Women's Health Presenter: Andi Winn Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: GSBS Student

Author(s):

- Andi Winn
- Kimberly Fulda
- Tracy Chamblee
- Leslie Allsopp

Abstract:

Purpose: Quick-relief medication (albuterol) for respiratory distress is a critical component of asthma care. For two decades, standing delegation orders (SDOs) for unassignedalbuterol at school have been recommended to ensure students have access to this potentially life-saving medication, but widespread implementation has been limited. Asthma 411 is an evidence-based model for school-based asthma programs that includes unassigned-albuterol within a framework of education and community resources. The Asthma 411 in Consortium in Tarrant County currently supports the implementation of this model with 11 partner school districts. Between 2002-2020, Asthma 411 used nebulizers as the delivery mechanism for albuterol. Due to concern about COVID-19 spread, an alternative delivery system was required beginning in 2020. The efficacy of Metered Dose Inhalers (MDIs) in combination with conventional holding chambers (spacers) is wellsupported in the literature, but they are prohibitively expensive for this application. MDIs in combination with disposable spacers were identified as an affordable alternative. Disposable spacers are approved for use in schools based on effective medication delivery under laboratory conditions. No evidence is available about user experience when used for respiratory emergencies at school. Importantly, disposable spacers vary substantively from conventional spacers in design and materials. This study provides preliminary evidence of user experience with disposable spacers and their effectiveness in school-health settings. Methods: Semi-structured questions addressing user experience were embedded within a larger, annual survey regarding satisfaction with Asthma 411; specifically ease of use for school health staff, ease of use for students, and perceived effectiveness. A four-point Likert scale was employed to avoid neutral responses. Where health staff indicated somewhat or very negative experiences, an open-ended prompt requested additional information. Survey questions were reviewed by an interprofessional team with expertise in survey and

evaluation research, Quality-Improvement, and the Asthma 411 program. Anonymous surveys were distributed to seven school districts (an estimated 176 school health staff) that had implemented disposable spacers for at least four months. This survey was conducted under North Texas Regional IRB protocol #2017-056. Results: Complete responses regarding MDI/spacer use were received from 146 staff (82.9%). Among these, 62.3% reported use of the disposable spacer for at least one instance of respiratory distress. Among users, 98% reported the MDI/disposable spacer was easy or somewhat easy for them to administer, 94% reported it was easy or somewhat easy for students and effective in relieving symptoms. Challenges were reported among students unfamiliar with spacers and more severe symptoms, and 71% indicated nebulizers should continue to be available for severe distress or children challenged to use the disposable spacer effectively. Conclusions: A strong majority of staff reported the disposable spacers were easy to use and effective for themselves and students. However, a majority also expressed a preference for having a nebulizer available for emergencies. This analysis is ongoing. Despite limitations, the study provides preliminary insights and a foundation for further research to support the effective implementation of national guidelines for school asthma programs.

Perspectives on Sexual and Reproductive Health Screening Conversations Between Healthcare Providers and Women Experiencing Homelessness

Abstract ID: UNTHSC246 Research Area: Health Disparities Presenter: Anelise Diener Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Anelise Diener
- Annalynn Galvin
- Stacey Griner
- Ashvita Garg
- Erika Thompson

Abstract:

Purpose: Women experiencing homelessness are at a heightened risk of sexually transmitted infections (STI) and unintended pregnancy. While the healthcare setting may be an ideal venue to assess the reproductive health needs of women experiencing homelessness, it is unknown how consistently this may be occurring for a population with competing health and social demands. This study aimed to assess healthcare providers' and women experiencing homelessness' perspectives of reproductive health discussions during healthcare visits. Methods: Semi-structured interviews were conducted with healthcare providers (n=6) and women experiencing homelessness (n=19) between December 2019 and November 2020 in Fort Worth, TX. Interviews were conducted as part of a larger systemwide study examining preferences for, facilitators of, and barriers to contraception for women experiencing homelessness. Participants were recruited through convenience and snowball sampling from local community and healthcare organizations serving the target population. Interviews assessed perceptions regarding need and implementation of women's health exams, birth control counseling, STI testing, and sexual health screening. Coding achieved consensus and thematic analysis was conducted. This study was reviewed and approved by the North Texas Regional Institutional Review Board. Results: Several themes emerged regarding the timing of healthcare appointments, sexual and reproductive health conversations, and perceptions of these conversations among women experiencing homelessness and healthcare providers. Only about half of the healthcare appointments occurred in the last year, within the recommended timeframe for annual health exams. In recalling STI and birth control conversations, women recounted inconsistency in the occurrence of these conversations and screenings. When these conversations occurred, women reflected on both positive (e.g., friendly, comfortable) and negative (e.g., awkward)

experiences with their healthcare providers. Finally, healthcare providers described the importance of having sexual and reproductive health conversations. However, healthcare providers acknowledged a bias as they perceive a lack of initiation of these conversations by women experiencing homelessness as disinterest in contraception and sexual healthcare. When aiming to prioritize these conversations, healthcare providers note conflicting priorities, including finding stable shelter, access to food, substance abuse, and healthy relationships with partners among women experiencing homelessness, as additional barriers that hinder the initiation of the conversations. Conclusion: This study identified potential inconsistencies in the frequency and quality of reproductive and sexual health conversations, STI screening, and birth control discussions between healthcare providers and women experiencing homelessness. Assumptions by healthcare providers that interested women will initiate sexual and reproductive health conversations puts the onus on women experiencing homelessness to be knowledgeable about, self-screen for sexually risky behaviors, and advocate for their sexual health needs. These findings, coupled with potentially extended periods of time between healthcare appointments, may highlight an opportunity for enhanced reproductive healthcare for this population. Future interventions can focus on improved sexual and reproductive health screening tools, patient intake forms, and clinical practice guidelines for healthcare providers, which can help achieve sexual and reproductive health equity for vulnerable populations.

Profiling Patient Exosomes as Key Regulators of Neurological Symptoms in Coronavirus Disease 2019 (COVID-19)

Abstract ID: UNTHSC244 Research Area: Microbiology / Infectious Disease Presenter: Amanda Tate Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Amanda Tate
- Wendy Phillips
- Kathleen Borgmann

Abstract:

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) pandemic, also known as coronavirus disease 2019 (COVID-19), has ignited the most significant world-wide health crisis of the 21st century. While acute COVID-19 infection has potentially lethal outcomes, there are also cases of post-acute sequelae of COVID-19 (PASC) infections, commonly known as â€~long-haul' COVID-19. In these long-haul cases, individuals experience prolonged neurologic symptoms including loss of taste and smell, altered level of consciousness, weakness, and chronic fatigue, months after acute COVID-19 infection has subsided. Currently, more than half of COVID-19 survivors present with at least one longhaul COVID-19 symptom. Additionally, there are no effective treatments for these complex neurological symptoms due to lack of sufficient knowledge of the mechanisms in which COVID-19 affects brain function and contributes to long-haul COVID-19 symptoms. Exosomes are extracellular vesicles (EVs) containing genetic material, protein, metabolites and lipids, which mirror their cell of origin. The physiologic role of exosomes has yet to be clearly defined, but it is widely speculated that these EVs play a fundamental role in cell-cell communication. Virally infected cells are able to release EVs that interact with distant cells and alter their typical biological functions. Similar to other neurotropic viruses, EVs have been isolated and characterized in samples from patients with COVID-19. A recent respiratory virus mimetic experiment has demonstrated the ability of EVs to enter the brain and collect in microglial cells. Based on this current research, we suspect exosomes are contributing to the development of chronic neurological symptoms seen in individuals with long-haul COVID-19. We hypothesize that there are differences in exosomes isolated from individuals with and without neurological symptoms following COVID-19 infection. Exosomes were isolated from nasal swabs of COVID-19 patients using ultra-centrifugation, and separated from viral particles using density gradient purification with 20% sucrose buffer. Exosomal small RNAs were isolated, and then identified using RNA sequencing. Sequencing

data was compared to both human and COVID-19 genomes using bioinformatics to determine expression levels and known functions of the small RNAs that are present. The exosomal RNAs characterized in this study will guide our future aims to identify the effects these EVs have on different neuronal cells. Differentially expressed cellular or viral RNAs could regulate long-haul COVID-19 neurological outcomes. We hope to gain an understanding of the role these EVs play in COVID-19 infections, as well as provide insight into potential therapeutic targets for individuals living with long-haul symptoms. Funding: This work was supported by US4 MD006882 from the National Institute on Minority Health and Health Disparities.

Targeted delivery of $\hat{I}\pm$ -Mangostin to Prostate Cancer Cells Utilizing Reconstituted High-Density Lipoprotein Nanoparticles

Abstract ID: UNTHSC243 Research Area: Cancer Presenter: Ammar Kapic Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Ammar Kapic
- Akpedje Dossou
- Andras Lacko
- Nirupama Sabnis
- Roland Petty
- Rafal Fudala

Abstract:

Purpose: Androgen deprivation therapy remains the primary treatment for inhibiting the progression of prostate cancer (PCa). However, depletion of systemic androgens enhances the development of androgen independence resulting in the highly malignant castrationresistant phenotype. Interest has grown in utilizing cell cycle checkpoint inhibitors to induce cellular arrest and apoptosis. A natural compound, $\hat{I}\pm\hat{a}\in\mathbb{N}$ Mangostin, possesses selective anti-cancer effects against PCa by inhibiting CDK4-CyclinD complex activity, thus restricting the progression of the cell cycle. However, the employment of $\hat{I}\pm\hat{a}\in\mathbb{N}$ Mangostin as a chemotherapeutic is limited due to its poor oral bioavailability and hydrophobicity, making delivery difficult. Reconstituted High-Density Lipoproteins nanoparticles (rHDL-NPs) are biocompatible targeted nanoparticles capable of encapsulating various compounds. Drug delivery is mediated through a non-endocytic mechanism via the Scavenger Receptor Class B Type-1 (SR-B1). Significant overexpression of SR-B1 has been documented in PCa, which enhances cholesterol accumulation thus fuels growth, proliferation, and intertumoral androgen synthesis. This increased expression of the SR-B1 makes it a primary target for the rHDL-NPs. Because of its lipophilic characteristics, we hypothesize that the I±â€``Mangostin can be successfully encapsulated in the rHDL-NPs, retain its biological effects, and be delivered via the SR-B1. Methods: The rHDL formulations were prepared using a modified protocol utilizing sodium cholate and sonication. The physical characteristics of the rHDL were determined using Dynamic Light Scattering (DLS), which include the polydispersity index (PDI) Zeta Potential particle diameter. The absorbance of the samples was measured using a spectrophotometer for the concentration of αâ€``Mangostin and used to calculate the encapsulation efficiency. The anisotropy was

calculated to compare the degree of molecular rotation between the free and encapsulated drug. The fluorescence lifetime (FLT) was used to detect changes in the local environment of the drug. Cytotoxicity studies were conducted using three cell lines: PZ-HPV as the normal cell line, DU145, and 22RV1 as the PCa cell lines. Different concentrations of free and rHDL encapsulated $\hat{I}\pm\hat{a}\in$ Mangostin were administered to 2D cell cultures to determine if there was a difference in cytotoxicity. Vehicle and empty particles were used as controls. A CCK-8 assay was used to determine the cell viability after administering the treatments. Results: The rHDL nanoparticles were produced to meet the standards of the NIH criteria for lipidbased nanoparticles. The drug was found in the same fraction as the rHDL, with an average encapsulation efficiency of 55%. There was a significant increase in anisotropy when compared to the free drug. The FLT decreased by more than half. The drug loading study found the maximum amount of drug encapsulated without decreasing the particle quality. Finally, the $\hat{I} \pm \hat{a} \in Mangostin rHDL-NPs$ continued to produce a cytotoxic effect comparable to the free drug. Conclusion: This study produced and characterized a stable $\hat{I} \pm \hat{a} \in Mangostin$ rHDL-NP formulation. The changes in the anisotropy and FLT suggest that encapsulation of the Ĩ±â€[™]Mangostin has occurred. Furthermore, the encapsulation of the αâ€[™]Mangostin did not block the cytotoxic effects against the PCa cell lines and decreased cell viability.

Honey, I'm Home: A Social Media Campaign for House Bill 331 Pertaining to Evidence-Based and Universal Home Visitation Programs in Texas

Abstract ID: UNTHSC242

Research Area: General Public Health Presenter: Jillian Molina

Submission Type: Competition Poster

Department: School of Public Health: Health Behavior & Health Systems **Classification:** School of Public Health Student

Author(s):

- Jillian Molina
- Stacey Griner

Abstract:

Background Universal and evidence-based home visitation programs can help address preterm birth, maternal death, domestic violence, and sudden infant death syndrome in Texas. Programs utilize trained health professionals to promote health and wellness by visiting homes of families before, during, and after pregnancy. Programs that were implemented have been shown to reduce domestic violence, prevent maternal death, promote economic stability, and connect families to helpful community resources. House Bill 331 (HB 331) pertaining to universal home visitation programs in Texas can provide families with education, resources, and advocates to be healthy. Objective The goal of the social media strategy and campaign was to educate the public on how home visitation programs can assist families and engage voters in a call to action so HB 331 could gain support and be passed in the upcoming 2023 legislative session. Methods To promote HB 331, a social media strategy was developed using Twitter as the platform for dissemination. One tweet was serious by mentioning public health issues while the other tweets were light-hearted and informative. In every tweet, HB 331 was mentioned. Two of the hashtags were used as a call to action while the others were meant to evoke emotion. The "memesâ $\in \Box$ were used to target young voters. Tweets will be launched in 2022, so people have time to reach out to their representatives for the 2023 legislative session. Results The social media posts were developed to inform young voters and gain support. The tweets communicate that home visitation programs promote healthy families, benefit everyone, and need the public's support to become reality in Texas. In the first tweet, a meme is used to ask the audience to change the author's mind about how helpful home visiting programs are. The content of the tweet then goes on to describe the benefits of the program and insinuate that their mind cannot be changed. The second tweet contains a photo of a home visitation occurring and contains information about what public health issues are being addressed by implementing these programs. This tweet is meant to be serious. Finally, the third tweet is a meme of the rapper Drake smiling at the notion of passing HB 331. In the content of the

tweet, the need for home visiting programs is explained in addition to how they can lower healthcare costs. Conclusions This campaign calls people to action and may increase HB 331 awareness. Social media is an appropriate avenue because it is cost-effective and can reach many. Other ways to advocate for the bill include writing a letter to the editor for your local newspaper, a letter to your representative, and sharing the tweets above. Home visitation programs are vital to the health of families in Texas and this campaign ensures that the state prioritizes the health of women and children. Further research on health information dissemination via social media is needed to ensure voters are effectively being reached and influenced by future social media campaigns and improve maternal and child health.

Creating a Novel 3D Printed Phantom to Simulate Ultrasound-Guided Pericardiocentesis

Abstract ID: UNTHSC240 Research Area: Education Presenter: Taylor Terlizzese Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Taylor Terlizzese
- Cassidy Miller
- Louisa Weindruch

Abstract:

With the growing impetus to provide increased patient safety, more programs are turning to simulation to teach invasive procedures to students. When learning ultrasound guided procedures with high complication risk, such as pericardiocentesis, learners can use models called phantoms to mimic sonographic anatomy. Phantoms allow users to practice image acquisition and needle placement in a low-stakes environment. Unfortunately, procedural phantoms are extraordinarily expensive, making training with them often inaccessible to many learners. Home-made phantoms, while economically practical, tend to lack durability and anatomical accuracy. Our goal is to design an anatomically accurate phantom that most learners can make on their own for a low-price to practice ultrasound guided pericardiocentesis. To develop a new model, we investigated previous phantoms and other novel approaches to design an anatomically correct chest cavity. The final model was created in a multistep process. In order to accurately simulate bone on sonography, the rib cage was engineered with computer aided design and 3D-printed using polylactic acid through fused deposition modeling with a 5mm thickness. The rib cage was then enclosed in a gelatin wax casing and covered with an opaque, gelatin-glycerin skin. The heart was also 3D printed using similar specifications and filled with water. The heart was then placed in a water-filled balloon in the chest cavity to allow for a drainable pericardiocentesis with visible fluid-filled ventricles. Ultimately, after much trial and error, we were successful in creating a life-like model for which students can practice ultrasound-guided pericardiocentesis. We hope this project can serve as a guide for other students who are interested in creating phantoms, both for pericardiocentesis or other procedures. Our difficulties reflect the many nuances of simulation, a growing field in medical education today. In the future, we plan to survey students and residents on their experience with our phantom. This will help us gain insight into user experience and ease of use. With this information, we hope to further finetune our phantom to create the best learning experience possible.

Factors Associated with Healthcare Provider Recommendations for Screening: Results from the 2017-2019 National Survey of Family Growth

Abstract ID: UNTHSC237

Research Area: General Public Health Presenter: Armando Dante Mendez Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Armando Mendez
- Stacey Griner

Abstract:

Early detection by screening for Human Immunodeficiency Virus (HIV) and sexually transmitted infections (STIs), such as chlamydia, gonorrhea, and syphilis, can prevent negative health outcomes such as delay and disruption of the HIV care continuum and infertility among men. STI screening recommendations typically focus on women and often overlook men, therefore healthcare provider recommendation and discussion have a strong influence on rates of HIV and STI screening. Research has also suggested provider-initiated conversations about HIV and STI screening may differ by patient's sociodemographic factors such as race and ethnicity and patient sexual behaviors. However, little is known on the specific interactions providers have with patients, including the risk factors and content discussed during sexual health visits and how that affects screening rates. The purpose of this study was to assess interactions with a healthcare provider regarding STIs and related risk factors and HIV/STI screening, adjusting (and testing interaction effects) for sexual orientation, race/ethnicity, and number of sexual partners. Using the 2017-2019 National Survey of Family Growth data, seven survey-weighted multivariable multinomial/binary logistic regression were analyzed in a complex, multistage probability-based sample designed to be representative of U.S. household members aged 15-49 years old. There were 5,206 men in the NSFG dataset; however, based on the inclusion and exclusion criteria, the final analysis sample consisted of 4,263 men. This study was approved by the North Texas Regional Institutional Review Board. Compared to White men, being Hispanic, Black, and Other race was associated with higher odds of a healthcare provider discussing: number of partners, condom usage, and type of sexual intercourse. Being a Black man was associated with higher odds of a healthcare provider discussing sexual orientation (aOR: 2.522 (95%CI: 1.711-3.592) and HIV/AIDS (aOR: 2.235), compared to White men. Identity as a Hispanic man was associated with higher odds of a healthcare provider discussing HIV/AIDS (aOR: 1.313) compared to White men. Identity as a sexual minority were associated with higher odds of a healthcare provider discussing all risk factors and HIV/AIDS compared to heterosexual men. A general trend was observed for number of sexual partners: every additional opposite/same-sex partner was associated with higher odds of HIV/AIDS screening (aOR: 1.080; 1.393), STI screening (aOR: 1.028; 1.201), respectively. Lastly, every additional same-sex partner was associated with higher odds of a healthcare provider discussing HIV/AIDS with the patient (aOR: 1.241). Results may provide insight on how healthcare providers facilitate HIV/AIDS and STI screening among men and which patient groups are more likely to receive a discussion of risks factors with from their healthcare provider. Additionally, these results may further support the need for more healthcare providers to utilize standardized guidelines for interactions with patients regarding sexual health (i.e., Sexual Health and Your Patients: A Provider's Guide by the National Coalition for Sexual Health). Future studies can use results from this study to design targeted interventions to promote equity in provider behavior and ultimately reduce the negative health outcomes associated with HIV and STIs.

Are Retail Sales of Delta-8 THC and Four Loko Associated? Findings from Fort Worth, Texas

Abstract ID: UNTHSC236 Research Area: General Public Health Presenter: Theresa Agwuncha Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Cassidy Loparco
- Kayla McDonald
- Drew Walker
- Theresa Agwuncha
- Mauli Vidyutbhai Shah
- Matt Boezinger
- Pamela Trangenstein
- Melvin Livingston
- Robert Yockey
- Dennis Thombs
- Matthew Rossheim

Abstract:

Objectives: Four Loko is an inexpensive and high-alcohol content product. Across the U.S., Four Loko retailers concentrate in impoverished areas; however, it is unclear whether this geographic patterning exists at a micro level, such as within a city. Delta-8 THC, an isomer of the more common form of the Cannabis plant Delta-9, is an unregulated psychoactive substance that was legalized by the Farm Bill in 2018. It is unknown if retailers that sell risky products like Delta-8 THC may be more likely to sell Four Loko, creating niche stores that sell unregulated or intoxicating substances. Methods: The study sample included 168 retailers in Fort Worth, Texas that had licenses to sell beer off-premise. Stores were contacted in September and October 2021 and asked whether they sold Delta-8 THC. Data regarding Four Loko's availability at each retail site was obtained from the manufacturer's website. Area deprivation index (ADI) scores, a marker of socioeconomic disadvantage (a continuous variable with range $1\hat{a}\in 10$, with higher scores indicating more disadvantage), were linked to each store's zip code. A multivariable logistic regression model was used to examine associations between retail of Delta-8 THC, having a retail tobacco license, ADI scores, and retail of Four Loko. Results: In the overall sample, 55% of stores sold Four Loko and 17% sold Delta-8 THC. Specifically, 41% of stores only sold Four Loko (mean ADI = 6.46, SE = 0.36), 4% only sold Delta-8 THC (mean ADI = 1.67, SE = 0.33), 14% sold both Four Loko and Delta-8 THC (mean ADI = 5.8, SE = 0.71), and 42% did not sell either

(mean ADI = 5.18, SE = 0.42). Logistic regression results indicate higher ADI scores (OR = 1.15, 95% CI = 1.03, 1.28) and selling Delta-8 THC products (OR = 8.50, 95% CI = 2.32, 31.17) were associated with increased odds of selling Four Loko. Having a tobacco license was also associated with increased odds of selling Four Loko products, although not statistically significant (OR = 3.41, 95% CI = 0.99, 11.76, p = 0.052). Discussion: Stores that sold Delta-8 THC were 8 times as likely to sell Four Loko. These results suggest that some retail locations may specialize in the sale of high-risk products, including unregulated products. This is important, especially in the context of retail locations, given the rapid development of novel psychoactive substances which future research should focus on. Given associations between type of product sold at each location and ADI scores, residents of socioeconomically deprived neighborhoods may have higher exposures to these dangerous products. Future research should assess the geographic distribution and density of Four Loko and Delta-8 THC sales to determine specific geographic areas that may be at high risk. Additionally, future research should investigate the etiology of health disparities and crimes near these establishments. Implications may suggest supporting the development and implementation of public nuisance laws and/or policies that restrict the sale of unregulated/high-risk substances.

Exosomal Proteins as Potential Markers for Breast Cancer Disparity

Abstract ID: UNTHSC235 Research Area: Cancer Presenter: Prathima Kandukuri Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Prathima Kandukuri
- Umesh Sankpal

Abstract:

PURPOSE: Breast cancer is the most common non-cutaneous malignancy and the second most lethal form of cancer among women in the United States. However, the mortality differs among different races, with Black women having significantly higher mortality rates than White women, even when factors like socioeconomic status are controlled. One explanation for this is the fact that Black women are diagnosed at higher rates with a particularly aggressive subtype known as triple-negative breast cancer (TNBC), which lacks the receptors that chemotherapy drugs classically target. It is important to recognize the various biological factors that contribute towards this health disparity. The overarching goal of this research is to identify differentially expressed exosomal proteins as potential makers to understand this disparity. Proteins under investigation include anti-apoptotic proteins and transcription factors. The specific goal for this project is to optimize protocol for exosome isolation and characterization. METHODS: MDA-MB-231 and MDA-MB-468 metastatic TNBC cell lines were cultured in media supplemented with exosome-depleted serum. After 24h, the culture media was centrifuged to remove cell debris and processed for exosome isolation using ExoQuick-TC kit (System Biosciences). The protocol involves precipitation of exosomes using the ExoQuick reagent. The exosomal pellet was resuspended in PBS and used for Western blot to analyze proteins and Nanoparticle Tracking Analysis (NTA) for determining exosomes size and concentration. The NTA calculates the size of the particles based on their movement. For Western blotting the antibodies used were against standard exosomal markers. RESULTS: Western blot analysis for exosomes showed that all samples were positive for standard exosomal protein markers such as Flotillin, CD54 and EpCAM and negative for non-exosomal marker GM130. The average size of the exosomes isolated from the MDA-MB-231 and MDA-MB-468 were 147.8 nm, and 146.6 nm respectively as determined by NTA. The concentration of exosomes from the two cells lines was determined to be 3.01e+8 Å \pm 7.96e+6 particles/mL for MDA231 and 1.61e+8 Å \pm 8.35e+6 particles/mL for MDA468. CONCLUSIONS: This research project streamlined a method to isolate and characterize exosomes from TNBC cell lines using the ExoQuick kit. The next step would be

to isolate exosomes from a panel of breast cancer cell-lines as well from serum or plasma derived from White and Black breast cancer patients. Exosomes from these racial groups will be probed to investigate the differential expression of any potential biomarker. Such markers can be developed into novel diagnostic tools or as potential therapeutic targets, which will help clarify and reduce the current mortality gap between the two populations.

Characteristics of Delta-8 THC retailers in a large metropolitan city

Abstract ID: UNTHSC233 Research Area: General Public Health Presenter: Cassidy LoParco Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Cassidy Loparco
- Drew Walker
- Kayla McDonald
- Sunidhi Santosh Pathak
- Jensen Eggleston
- Sofia Olsson
- Robert Yockey
- Justin Luningham
- Amanda Kong
- Doug Henry
- Matthew Rossheim

Abstract:

Background: Retail sales of Delta-8 THC, an isomer of the more common form of cannabis (Delta-9 THC), have increased in the U.S. market since the passing of the 2018 Farm Bill. Specifically, the Farm Bill allowed for the sale of hemp products, which are classified as products having less than 0.3% Delta-9 THC by dry weight. Importantly, sales of Delta-8 THC are unregulated and may introduce possible risk arising from either psychoactive effects or unregulated solvents left behind from the synthesis of Delta-8 THC from CBD. The current study describes the Delta-8 THC retail sales environment in a large metropolitan city. Methods: Potential Delta-8 THC retailers were identified by identifying lists of current retail locations with alcohol, CBD, and tobacco licenses in Fort Worth, Texas (n = 1,961). Research assistants called retailers between September 8 and October 14, 2021, to query about sales of products containing Delta-8 THC; 69% (n = 1,223) of retailers answered and provided data on Delta-8 THC. Outlets' 9-digit ZIP codes were merged with area socioeconomic deprivation index scores. Chi-squared tests compared socioeconomic deprivation index scores between outlets that sold Delta-8 THC versus those that did not sell Delta-8 THC. Among a subsample of those who did sell Delta-8 THC, t-tests examined associations between prices and the type of Delta-8 THC products. Results: Approximately one in ten retail outlets (11%, n = 133) reported selling products containing Delta-8 THC. Most (96%) sold Delta-8 THC in the form of flower/vapes, and three-fourths (76%) sold
edibles. Among the least expensive Delta-8 THC products available at these retail outlets were edibles (mean price = \$15.39), which cost \$8.58 less than flowers/vapes (mean price: \$23.97; p < 0.001) on average. Retail outlets that sold Delta-8 THC, compared to those that did not, were in zip codes with greater deprivation (p = 0.02). Most outlets reported having a minimum age for sales of Delta-8 THC as 21 years; however, 4% reported 18 years or no minimum age for sale of Delta-8 THC products. Discussion: Delta-8 THC retail outlets were disproportionately located in ZIP codes with higher levels of socioeconomic deprivation. Legal intervention, such as zoning laws, may be warranted to prevent potential health disparities from overexposing a subset of communities to these products. Policies, such as increasing Delta-8 THC product prices and restricting the types of products sold may help reduce access and appeal to people under 21 years old.

The Associations between Physician-Patient Encounter Characteristics and Chronic Low Back Pain Outcomes

Abstract ID: UNTHSC232 Research Area: Community Medicine Presenter: Ramyashree Nyalakonda Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Ramyashree Nyalakonda
- Prathima Kandukuri
- Salman Patel
- George Beeton
- John Licciardone

Abstract:

PURPOSE Low back pain is the leading cause of disability, affecting 577 million persons worldwide. As there are relevant clinical practice guidelines from the Centers for Disease Control and Prevention and the American College of Physicians that have been widely implemented in the United States, factors other than treatment may have an important impact on clinical outcomes. This study aimed to determine if aspects of the physicianpatient encounter affect long-term outcomes among patients with chronic low back pain (CLBP). METHODS Participants in this retrospective cohort study were recruited from the PRECISION Pain Research Registry from April 2016 through December 2021. Eligible participants reported CLBP according to criteria established by the National Institutes of Health, were 21-79 years of age, and had a physician who regularly treated their low back pain. Characteristics of the physician-patient encounter were measured with the Communication Behavior Questionnaire, Consultation and Relational Empathy Measure, and the Patient Satisfaction Questionnaire (PSQ) and classified according to tercile cut points. The PSQ measure included the five scales most closely related to physician behavior during medical care (general satisfaction, technical quality, interpersonal manner, communication, and time spent with patient). Outcomes were measured at quarterly encounters over 12 months using a numerical rating scale (NRS) for pain intensity, the Roland-Morris Disability Questionnaire (RMDQ), and the SPADE cluster (sleep disturbance, pain interference, anxiety, depression, and low energy/fatigue) derived from the Patient-Reported Outcomes Measurement Information System. The latter measures health-related quality of life. Higher scores represent worse outcomes on each measure. Longitudinal outcomes were assessed using repeated measures analysis of variance. RESULTS Patient satisfaction most consistently and strongly predicted outcomes (P< 0.001). Health-related quality of life was strongly associated with each aspect of the physician-patient encounter. Participants who

rated their physicians in the highest tercile for satisfaction reported lower scores for NRS (mean, 5.77; 95% CI, 5.56-5.98 vs mean, 6.11; 95% CI, 5.91-6.32 for reference category), RMDQ (mean, 13.22; 95% CI, 12.50-13.94 vs mean, 15.33 95% CI, 14.63-16.02), and SPADE (mean, 56.06; 95% CI, 55.25-56.87 vs mean, 59.22; 95% CI, 58.44-60.00). Similarly, participants who rated their physicians in the highest tercile for empathy reported lower scores for SPADE (mean, 56.30; 95% CI, 55.45-57.15 vs mean, 58.75; 95% CI, 57.95-59.55). CONCLUSIONS Various aspects of the physician-patient encounter may impact long-term outcomes of patients with CLBP. Most notably, patient satisfaction was consistently and strongly associated with all outcomes. The PSQ, a composite measure including satisfaction with such factors as physician communication and interpersonal manner, appears to be a stronger predictor of clinical outcomes than two other instruments that each focused specifically on physician communication or empathy. These findings have potentially important public health implications because CLBP management in the United States is driven by widely accepted clinical practice guidelines. Thus, it appears that the physician-patient encounter offers a mechanism for augmenting the effects of recommended CLBP treatments.

Blood Pressure Responses to Exercise in Females: Impact of race

Abstract ID: UNTHSC228 Research Area: Cardiovascular Presenter: Andrew Fletcher Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (2nd Year)

Author(s):

- Andrew Fletcher
- Zachary Martin
- Rachel Skow
- Emily Merlau
- Iman Aldaas
- Natalia Cardenas
- Jeremiah Campbell
- Paul Fadel
- Matthew Brothers

Abstract:

Purpose: A primary risk factor for cardiovascular disease (CVD) is hypertension, which impacts $\sim 50\%$ of individuals in the United States >18 years of age. Although resting blood pressure (BP) measures are informative, an exaggerated BP response to exercise, termed exercise-induced hypertension, has emerged as a strong predictor of future hypertension and subsequent CVD risk. In the United States, race/ethnicity-related health disparities persist. For example, Black females (BF) have an $\sim 20\%$ higher prevalence of hypertension and CVD relative to White females (WF). However, whether there are differences in the BP response during exercise between these populations remains unclear. Accordingly, in this preliminary study, we tested the hypothesis that BF have an exaggerated BP response during exercise relative to WF. Methods: 14 females (7 Black and 7 White, age 18-27 yrs, BMI 21.3-30.1 kg/m2), free from CVD or other health conditions, participated. All participants underwent a staged maximal exercise test on a cycle ergometer. Each stage was 2 min in duration and were based on individualized predicted maximal oxygen consumption (VO2peak). BP (Tango stress monitor), heart rate (3 lead EKG), and VO2 (Parvo metabolic cart) were collected during the final minute of each stage of the exercise protocol. The BP increase during exercise was evaluated as change in mean arterial pressure (delta MAP) and change in systolic BP (delta SBP) from rest to peak exertion. The SBP response for any given increase in workload was further analyzed as the slope of the relationship between SBP and metabolic equivalents (MET; SBP/MET). Results: Blood pressure responses during exercise were not different between groups; delta MAP (BF: 10

+/- 3 mmHg and WF: 20 +/- 3 mmHg; p=0.06) delta SBP (BF: 42 +/- 7 and WF: 48 +/- 6; p=0.49). Likewise, the SBP/MET slope (BF: 7.8 +/- 5.9 mmHg/MET and WF: 6.5 +/- 1.8 mmHg/MET; p=0.66) and exercise capacity as identified by VO2peak were not different between groups (BF: 2 +/- 0.1 L/min and WF: 2.2 +/- 0.2 L/min; p=0.46). Conclusions: These preliminary data suggest that the BP response during peak exercise is similar between relatively young and healthy Black and White females. Further investigation with more participants is warranted.

COVID-19 Vaccination Disparities and Hesitancy in the United States

Abstract ID: UNTHSC226 Research Area: Health Disparities Presenter: Christy Xavier Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: Postdoctoral Fellow

Author(s):

- Christy Xavier
- Bryn Lindley
- Rafia Rasu

Abstract:

Background: Currently, 62.8% of Americans are fully vaccinated against COVID-19, which is lower than most first-world countries. Despite the ongoing COVID-19 pandemic and complications, many Americans are still hesitant to vaccinate. Objectives: The purpose of this study is to identify vaccine rates and trends by biological and socioeconomic demographics and determine reasons for vaccine hesitancy in the U.S. Methods: This is a repeated cross-sectional analysis with data on American adults without missing data on vaccine status and vaccine intent (N = 59,989) from the U.S. Census Bureau's Household Pulse Survey (Phases 3.2-3.3, July 21, 2021-February 7, 2022). The Household Pulse Survey is an online randomized survey to get information on how COVID-19 affects American households. The survey is collected every two weeks in phases. Vaccine hesitancy was divided into two groups: 1) probably, not sure, probably not, and definitely not receiving the vaccine, and 2) received the vaccine and definitely will get the vaccine. Chisquare tests and logistic regressions were conducted using replicate weights with SAS. Logistic regressions adjusted for sex, age, race and ethnicity, income, education, Covid-19 infection, health insurance, food insecurity, children under 17 years in the household, remote work, health worker status, functional status, and mental health. Results: During the December 1-13, 2021 survey period, 78.9% had received at least two doses of the COVID-19 vaccine. A majority of the vaccinated (51.6%) received the Pfizer vaccine. Those that were highly educated with a college degree (68.1%) and had a salary of \$100,000+ (38.5%) were more likely to be vaccinated. Of those not vaccinated (Wt N = 33,340,678), 87.7% reported that they are unsure, probably, or definitely not (51.5%) get the vaccine. In adjusted analyses, older adults (AOR = 0.85, 95% CI=0.77 - 0.94 for 5-year increments) and health workers (AOR = 0.24, 95% CI = 0.08-0.69) were less likely to be vaccinehesitant. Those with high school education were more likely to be vaccine-hesitant (AOR = 2.37, 95% CI = 1.44-3.90) compared to college-educated adults. Adults with COVID-19 infection were more likely to be vaccine-hesitant (AOR = 2.24, 95% CI = 1.41-3.57).

Mistrust of the vaccine or government (52.1%), side-effects (50.2%), vaccine not needed (32.1%), and the vaccine will not protect me (23.6%) were cited as the top four reasons for vaccine hesitancy. Blacks and Hispanics reported similar reasons. Individuals in the South were more likely to cite distrust in COVID-19 vaccines than any other region. Conclusions: Among unvaccinated, over 50% of adults reported that they are "definitely not getting the vaccine". Vaccine hesitant adults were more likely to distrust the vaccine or the government; they were also concerned about the side effects. Targeted interventions by clinicians, public health officials, and policy makers to educate the public about side effects of the vaccine and increase trust in the health care system may help improve vaccination rates and achieve herd immunity in the US.

Effect of systemic administration of $\hat{I}\pm7$ -nicotinic acetylcholine receptor ligands on renal inflammation in young mice with systemic lupus erythematosus

Abstract ID: UNTHSC225 Research Area: Integrative Physiology Presenter: Calvin Brooks Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Calvin Brooks
- Cassandra Young-Stubbs
- Caroline Shimoura
- Viet Dinh
- Sarika Chaudhari
- Victor Uteshev
- Keisa Mathis

Abstract:

Systemic lupus erythematosus (SLE) is an autoimmune disease where renal inflammation contributes to hypertension. The cholinergic anti-inflammatory pathway is a recently described pathway where stimulating the vagus nerve causes release of acetylcholine from choline acetyltransferase (ChAT)+ T-cells in the spleen. This acetylcholine acts on alpha-7 nicotinic acetylcholine receptors ($\hat{1}\pm7nAChR$) of immune cells to hault the production of proinflammatory cytokines. Our lab has shown stimulation of this pathway at multiple levels lessens autoimmunity, renal inflammation and hypertension in SLE mice. However, our recent attempts to target the $\hat{I}\pm7nAChR$ directly with a positive allosteric modulator (PAM) in mice with advanced SLE have not yielded similar results. This may be due to decreased parasympathetic tone in these mice in which the PAM is not able to compensate for. The aim of the current study was to determine if activating the $\hat{I}\pm7nAChR$ in SLE mice at an earlier age, before dampening of parasympathetic tone, prevents the onset of hypertension and renal inflammation. Twelve week old female NZBWF1 mice, which spontaneously develop SLE, and NZW controls were given a partial agonist of the $\hat{I}\pm7nAChR$, GTS-21, a PAM, PNU-120596, or vehicle continuously for two weeks via subcutaneous osmotic minipump. Mean arterial pressure (MAP) was measured by carotid artery catheter in conscious, freely moving mice at 14 weeks. Mice were then euthanized and blood, spleen and kidneys harvested to allow measurement of plasma double stranded (ds) DNA autoantibodies via ELISA to assess severity of disease. There was no difference in dsDNA autoantibody activity (U/mL) between SLE mice and controls (all data presented as mean $A\pm$ SEM; $76026.3 \text{\AA} \pm 38901.4 \text{ vs.} 19617.4 \text{\AA} \pm 4092.7; p=0.1141$). The treatments had no effect on

autoantibody activity in SLE mice [76026.3ű38901.4 (SLE vehicle) vs. 36951.7ű5962.3 (SLE PNU) vs. 56279.7ű31381.0 (SLE GTS)] or controls [19617.4ű4092.7 (Con vehicle) vs. 17293.2ű3384.1 (Con PNU) vs. 16016.2ű3059.6 (Con GTS)]. MAP (mmHg) did not differ significantly between young SLE and control mice (143.53ű3.26 vs. 128.8ű4.95). Additionally, the treatments had no effect on MAP of SLE mice [143.53ű3.26 (SLE vehicle) vs. 128.32ű10.92 (SLE PNU) vs. 129.56ű19.50 (SLE GTS)] or controls [128.8ű4.95 (Con vehicle) vs. 127.60ű4.43 (Con PNU), vs. 125.65ű5.54 (Con GTS)]. Based on these results, we suspect that the disease process has not progressed enough in 14-week-old mice to see differences due to these treatments. Although the changes in the blood pressure and dsDNA antibodies are not significant, we will continue to evaluate renal damage and cytokine profile to determine the effect of these 1 ± 7 nAChR ligands on pathogenesis of SLE. Future studies will aim to modulate 1 ± 7 nAChRs in SLE mice before the onset of disease (~12 weeks of age) through 35 weeks when mice usually experience terminal disease to determine efficacy of early activation of the cholinergic anti-inflammatory pathway in halting the progression of SLE.

Quality Improvement Project: Advanced Care Planning in a Rural Family Practice Clinic

Abstract ID: UNTHSC222 Research Area: Community Medicine Presenter: Lauren West Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (3rd Year)

Author(s):

Lauren West

Abstract:

Purpose: Advanced Directives are a crucial means of ensuring patient's autonomy at the end of life. However, despite their importance, studies have continued to find that they are significantly underused in the United States. This project determined the prevalence of patients with Advance Care Directives in a rural family practice clinic. The primary purpose of this project was to provide patients over age 65 with an educational resource discussing Advance Care Planning. Methods: Patients eligible for this study were identified by nursing staff during check-in for office visits. All patients over the age of 65 were deemed eligible to receive the intervention. The nursing staff then performed a chart review to determine if the patient already had an Advance Care Plan created within the last 5 years on file. The nursing staff briefly discussed code status and living wills with all patients. The patient then received a 2-page Advance Care Planning handout from the American Academy of Family Physicians. Results: During the study period, a total of 77 patients were eligible and 91% of them received the intervention. Of the patients who participated in the study 71% did not have an up-to-date Advance Care Plan already documented in the EMR. Conclusions: This project demonstrates the lack of documented Advanced Directives and the great need for Advance Care Planning education among those aged 65 years and older in rural family practices. Future interventions should involve adding flags in the EMR to help identify patients who lack an Advanced Directive, and to prompt the provider to discuss Advanced Care Planning. Further follow up in 1 year is necessary to determine the true impact of the quality improvement project.

Surveying the mental health of adolescent and young adult cancer survivors with treatment derived late effects

Abstract ID: UNTHSC219 Research Area: Cancer Presenter: William A Mitchell Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- William Mitchell
- Laura Howe-Martin
- Angela Orlino
- Katelyn Jetelina
- Emily Berry
- Keith Argenbright

Abstract:

Purpose: Survival has steadily improved for adolescent and young adult (AYA) cancer survivors over the last 25 years, yet more information is still needed to understand the unique challenges facing AYA cancer survivors resulting from the development late effects due to treatment, and how it may impact mental health in this population. As an example, occurrence of cardiotoxicity, one of the most severe treatment-based side effects, could be expected to have a larger impact on mental health than less severe side effects, like peripheral neuropathy, osteopenia, or gonadal dysfunction. Our aim is to describe the impact of these late effects on patient mental health using semi-structured interviews completed with patients receiving care through the After the Cancer Experience (ACE) program at Children's Medical Center in Dallas. Methods: English-speaking patients who were between 15 and 55 years of age with a documented diagnosis of cancer treatment related late effect, were eligible to participate in the study. To date, three patients have completed the necessary study questionnaires, including the Personal Health Questionnaire $\hat{a} \in$ 9 (PHQ-9) for depression, Generalized Anxiety Disorder Scale (GAD-7), Quality of Life Patient/Cancer Survivor Version (QOL-CSV), and the Healthcare System Distrust Scale, and the corresponding semi-structured interview. Results: Participants were primarily female (n = 2) and the average age at diagnosis was 16 years. At time of study participation, patient age ranged from 24 to 52 years. All participants received chemotherapy as their primary course of treatment, with two of three also undergoing surgery as part of their treatment plan. Late effect diagnoses include peripheral neuropathy, foot drop, and cardiotoxicity. Conclusion: AYA cancer survivors have a unique set of circumstances when diagnosed with cancer specific to their age demographic. This population is receiving a cancer diagnosis during an integral time of forming individual identity and social growth. The challenging

themes highlighted in these patient interviews include identity formation and need for social and emotional independence, some of the most impactful challenges in the AYA population; these findings are consistent with literature. While prior societal norms and structural challenges previously made addressing mental health difficult, patients now seem to have greater access to mental health resources, including consistent therapy, which appears to have lessened the impact of a subsequent late effect diagnosis on the patient's overall mental health. These interviews highlight the importance of individually tailored multimodal care to address the unique needs and distinct circumstances specific to this age demographic. Specifically, neglecting mental health during treatment, can trigger previously unrecognized or repressed emotions to resurface with the emergence of a diagnosis related to cancer treatment, whereas, the early detection of mental health concerns in cancer patients may not only address the immediate mental health needs, but also better equip a patient to maintain long term positive mental health when faced with subsequent challenges and diagnoses related to cancer treatment.

Hybrid molecule SA-2 improves both mitochondrial respiration and glycolysis in primary human trabecular meshwork cells

Abstract ID: UNTHSC218 Research Area: Eye / Vision Presenter: Charles Enyaah Amankwa Submission Type: Competition Poster Department: North Texas Eye Research Institute Classification: GSBS Student

Author(s):

- Charles Amankwa
- Biddut Deb nath
- Sudershan Gondi
- Dorota Stankowska
- Suchismita Acharya

Abstract:

Purpose: Oxidative stress (OS) caused by hypoxia/hyperoxia environment results in progressive loss of trabecular meshwork (TM) cells in primary open angle glaucoma (POAG). Our previous report demonstrated; a hybrid nitric oxide (NO) donor-antioxidant molecule SA-2 protect primary human (h) TM cells against t-butyl hydrogen peroxide (TBHP) induced cell death and increased superoxide dismutase enzyme level. Here we investigated the effect of SA-2 on mitochondrial energy metabolism by measuring the respiration status, glycolysis rate and energy production. Methods: Primary hTM cells obtained from human donor eyes were seeded in 24-well culture plates (Seahorse XFe 24 Cell Mito Stress test kit, Agilent), and starved for 24h before treatment with SA-2 (1 µM,10µM,100µM, and 1mM). In a separate experiment, the cells were pretreated with TBHP (150Å μ M) for 30 minutes, followed by the addition of SA-2 (10µM,100µM). After 24h, the mitochondrial complex inhibitors and uncoupling reagents (oligomycin, FCCP, rotenone/antimycin A) were added. The plate was analyzed for changes in oxygen consumption rate (OCR) and extracellular acidification rate (ECAR) using the Seahorse XFe24 analyzer following the manufacturer's instructions. Results: The mean OCR was significantly decreased (>70%) followed by increase in the mean ECAR (~3-fold) after treatment with TBHP compared to oligo/FCCP/rot treated cells, hereafter called as negative control. Treatment with SA-2 at 1 µM,10µM,100µM and 1mM concentrations increased both oligomycin/FCCP induced decrease in ATP production and maximal mitochondrial respiration followed by an increase in the mean ECAR compared to negative control. The mean OCR was higher in SA-2 $(100 \hat{A} \mu M)$ +TBHP treated cells followed by an increase in ECAR in SA-2 $(10 \hat{A} \mu M)$ or $100 \hat{A} \mu M$) +TBHP treated cells than TBHP and negative control treated cells. N =2-3. Conclusion: Mitochondrial respiration was impaired after TBHP treatment to hTM cells following cell

death. While most of the mitochondrial targeting anti-oxidant compounds increase OCR but not ECAR, we found the hybrid NO donor-anti-oxidant compound SA-2 increases ATP production, maximal mitochondrial respiration and increases glycolytic energy production in hTM cells. This finding provides a novel direction for further investigation into the effect of SA-2 and mitochondrial bioenergetics during OS-induced cell death.

Molecular Docking Study of Positive Allosteric Modulators of the Sigma-1 Receptor for the COVID treatment of elderly patients

Abstract ID: UNTHSC216

Research Area: Pharmaceutical Sciences Presenter: Sareena Contractor Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Sareena Contractor
- Pratibha Kumari
- Jin Liu

Abstract:

Purpose: Our goal with this project is to determine conformations of ligands that have strong affinities to allosteric sites of the Sigma-1 Receptor (Sig1R). The SARS-CoV-2 strain virus is part of a group of viruses known as RNA Positive Sense Coronaviruses. The virus enters the cell through endocytosis and replicates in a cellular compartment derived for the Endoplasmic Reticulum (ER). Viral replication causes ER stress and forces the cell to adapt. The Sig1R found within the membranes of the nucleus, ER, and mitochondria. The receptor protein can change conformation to help the cell cope with ER stress. Positive Allosteric Modulators (PAMs) bind to the Sig1R and cause conformational changes that can alter its response to natural ligand binding. By targeting the Sig1R we can create therapeutic responses to the SARS-CoV-2 virus by modulating ER stress response signaling pathways for elderly patients. Method: We performed molecular docking for the Nonselective, Selective and Putative ligands of Sig1R.With molecular docking, we were able to determine the binding affinities and conformations of three types of PAMs in relation to the Sig1R. Results: The study showed that nonselective allosteric modulators have the strongest binding affinities for the Sig1R. Through molecular docking and 3D visualization, the data showed that most PAMs bind to the monomeric Sig1R at an orthosteric binding site. The only ligand to bind at a site other than the orthosteric site was SCH23390. The rest of the ligands bound to the receptor at the orthosteric site, which would indicate that they would need to compete with the receptor's natural ligands for binding. To avoid the competition, the PAMs need to bind to the receptor at a site different from their first pose, or most preferred configuration. Conclusion: This project showed us that non-selective PAMs have a higher binding affinity. We were also able to identify a need to explore other binding configurations, besides the first pose, to find allosteric binding of the PAMs to the Sig-1R.

Changes in PVN Neurons after Low-Frequency Acute Optogenetic Stimulation

Abstract ID: UNTHSC213 Research Area: Neuroscience Presenter: Obed Paundralingga Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Obed Paundralingga
- Shuping Jia
- Joseph Cunningham

Abstract:

The paraventricular nucleus of the hypothalamus (PVN) is an important autonomic control center. It receives afferent inputs from many brain regions, including the median preoptic nucleus (MnPO). The connection between the MnPO and the PVN is particularly important in generating chronic intermittent hypoxia phenotypes such as increased sympathetic activity leading to the development of hypertension. PVN-projecting MnPO neurons discharge frequency is < 5Hz. To gain more insight into the acute change in PVN neuron properties after low-frequency stimulation, whole-cell patch-clamp recordings were performed on PVN neurons. Adult 250-350g male rats were injected bilaterally in the PVN with 100 nL retrogradely transported adeno-associated virus encoding Channelrhodopsin (AAVrg-CaMKIIa-hChR2(H134R)-mCherry) or with AAVrg-CAG-tdTomato as control. Three weeks after the injections, rats were anesthetized with isoflurane (2-3%) and sacrificed to prepare horizontal brain slices containing the PVN and MnPO. With the bath perfused with normal aCSF (2-3 ml/min), postsynaptic currents were recorded from PVN neurons in whole-cell voltage clamp configuration (Vhold=-60 mV). Axon terminals in the PVN were stimulated with 5Hz LED-generated blue light (470nM) pulses of 50-ms duration, 5 seconds off/on, for a total of 1 min. Evoked currents were measured every 5 min before and after the photostimulation train. Amplitude and frequency of spontaneous currents were compared before and after stimulation as well. At the end of each recording, cells were characterized as type I (magnocellular) or type II (parvocellular) PVN neurons based on the presence of transient outward rectification. Data were analyzed offline using Easy Electrophysiology v2.3.3 software. For both cell types, 5 Hz optogenetic stimulation caused a significant reduction in the optogenetic-evoked current amplitude during the first 15 minutes after stimulation (before stimulation $94.88\hat{A}\pm 2.85$ %, n=9 cells vs. 15 minutes after stimulation $67.52\hat{A}\pm6.15$ %, n=9. P=0.0027) before returning to baseline values. Post-stimulation spontaneous postsynaptic current amplitude and frequency decreased in type II PVN neurons from retrograde ChR2 animals (pre-stimulation amplitude 100±0.62 % vs. poststimulation amplitude 86.50Å \pm 0.54 %, P=0.0371; pre-stimulation frequency 3.82Å \pm 1.7 Hz, post-stimulation frequency 2.396Å \pm 1.2 Hz, P= 0.0385) but not in type I PVN neurons from retrograde ChR2 animals or cells from control animals. Kinetic profiles of spontaneous current in type I and II PVN neurons did not change after 5 Hz optogenetic stimulation. The results suggest that low-frequency MnPO photostimulation differentially might reduce spontaneous presynaptic neurotransmitter release and possibly postsynaptic responsiveness in PVN neurons. Additional experiments will be needed to specifically stimulate PVN afferents from the MnPO.

Altered Balance in those with Back Pain

Abstract ID: UNTHSC212 Research Area: Physical Medicine / OMM Presenter: Alexander R. Doederlein Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Alexander Doederlein
- Shawn Kennedy
- Rita Patterson

Abstract:

Purpose: Numerous studies have attempted to find an association between back pain (BP) and altered standing balance. These quiet standing (QS) studies measure a subject's center of pressure (COP) via a force plate system. From the COP data, variables such as COP area and COP velocity are calculated to measure the amount of sway a subject had while attempting to stand still during the QS trial. In reviewing previous research, most studies had relatively small sample sizes, and while some were able to achieve statistically significant differences in sway variables between subjects with BP and healthy controls, most were too underpowered to achieve clinical statistical significance. Also, what is concerning is that some studies with shared variables had inconsistent results of whether BP or healthy control participants had greater values. Our study sought to test potential associations with a much larger sample size (greater than 10-fold larger than many other studies) to find clinically meaningful relationships. Methods: This research is built from the results of previous QS studies and an ongoing QS project at UNTHSC. A Bertec force plate (Bertec, Columbus, Ohio) was used to collect data from participants standing quietly on it for a period of 30 seconds with their eyes open (EO), and then 30 seconds with their eyes closed (EC). Each 30 second period was collected as three 10 second trials for each condition. This study's data was collected from people suffering from BP and healthy controls. Results: COP area was statistically significantly greater for BP subjects, however, only during EC trials. In contrast, during EO trials, the COP area was not statistically different between the two groups. Furthermore, in distinction from previous studies, velocity was statistically significantly greater for healthy controls regardless of the trial's eye condition. Conclusions: These results led us to hypothesize that during the EC trials, BP subjects cover a greater COP area than the controls due to decreased proprioception, in which they sway further from their balance point before being able to detect they are moving. However, in EO trials, this area is not statistically different, likely because BP subjects have learned to compensate for their decreased proprioception by relying more on their vision for positional sense. Furthermore, since the healthy controls exhibited a greater

velocity than the BP subjects, this could mean that the BP subjects are taking longer to regain their balance due to decreased reflexes. In conclusion, we suggest that future QS studies screen subjects for delays in reflexes, a lesser sense of proprioception, and whether lighting conditions create altered sway outcomes. This study contributes precautionary information to help prevent falls in those with BP.

Design of man-made miniature CRISPR-Cas systems using computational technologies

Abstract ID: UNTHSC196 Research Area: Pharmaceutical Sciences Presenter: Vindi Mahesha Jayasinghe Arachchige Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Postdoctoral Fellow

Author(s):

- Vindi Jayasinghe Arachchige
- Jin Liu

Abstract:

Purpose: An RNA-guided targeted genome engineering platform, CRISPR/Cas system is one of the breakthroughs of the twenty-first century. Despite the wealth of its advancement, there are some associated limitations that need to be overcome for the betterment of this revolutionized technology. Among them, the larger size of the available Cas proteins that are essential for the functioning of these tools limits their in vivo administration due to the low delivery efficiency. To address this issue, we have used computational chemistry tools to design smaller versions or compact size Cas proteins that can be used as an alternative. Methods: The available crystal structures of CRISPR-Cas systems were utilized and the reduction was done preserving the regions that are essential for the DNA binding and cleavage functions using Chimera, Yasara, and the Swiss Model software. Molecular Dynamics (MD) simulations were performed to obtain stable conformations of the reduced structures. The minimized sequences were used to generate their structures by the Swiss Model. Results/Conclusions: Four stable man-made miniature Cas proteins were generated that are less than half the size of the currently used CRISPR systems such as Cas9 or Cas12a. The sequence-based modeling studies using the Swiss model have shown the similar folding of these reduced proteins compared to their original counterparts. Further experimental validation of their ds-DNA cleavage activities remains to be determined at this point of the study.

Development of a Machine Learning Model to Design Target-specific Ligands

Abstract ID: UNTHSC195 Research Area: Pharmacology Presenter: Ezek Mathew Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Ezek Mathew
- Jin Liu
- Duen-Shian Wang
- Kevin Liu

Abstract:

Background: As the estimated cost required to bring a drug to market ranges from \$314 million to \$2.8 billion, drug discovery is undoubtedly a lengthy and expensive process. Additionally, completion of Phase 3 trials does not guarantee FDA approval. For most drugs, the probability of receiving FDA approval ranges from 9% to 14%, depending on the time period. Therefore, researchers have turned to machine learning (ML) to decrease the burden of drug discovery for multiple targets. In the central nervous system (CNS), the metabotropic glutamate receptor subtype 2 (mGlu2) and metabotropic glutamate receptor subtype 3 (mGlu3) play various roles in normal physiology. Therefore, ligands of these receptors pose potential for the treatment of various pathologies, such as Alzheimer's disease, schizophrenia, and other neurological disorders. Currently, no literature exists referencing a machine learning model that is capable of distinguishing drug ligands based on their affinity to mGlu2 or mGlu3. To fill this gap in knowledge, we will design a machine learning algorithm capable of making associations across the entire data set, identifying patterns that the human eye cannot detect. Methods: We utilized a dataset which included two dimensional (2D) images of drug ligands belonging to two classes, mGlu2 or mGlu3. The images were resized, then converted into grayscale and subsequently processed as a numerical NumPy array with their associated labels. Convolutional Neural Network (CNN) and Functional API architecture were tested to determine the optimal model. Hyperparameter optimization occurred throughout this process. Results: The CNN and Functional API both reached 100% accuracy within 20 epochs, successfully classifying ligands as mGlu2 or mGlu3 based on 2D structure alone. However, the Functional API reached 100% accuracy in under 5 epochs, yielding superior performance when compared to the CNN. Conclusion: While the CNN is one of the most popular ML architectures for image classification, the Functional API can perform a similar role. As datasets expand, it

may be beneficial to consider more efficient models, especially for image classification in the realm of drug discovery.

An Investigation of the Allosteric Effects of Agonist and Antagonist Ligands on Sigma-1 Receptor using MD Simulation and Machine Learning Methods

Abstract ID: UNTHSC194 Research Area: Pharmaceutical Sciences Presenter: Pratibha Kumari Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Postdoctoral Fellow

Author(s):

- Pratibha Kumari
- Jin Liu

Abstract:

Purpose: Allosteric regulation is the control of the activity of a protein or protein complex by the binding of a ligand or effector molecule, at a site topographically distinct from the active site of the protein. The sigma-1 receptor (Sig1R), a small-ligand operated transmembrane protein, has been implicated in various neural processes such as calcium signalling, cell survival and function, inflammation, and synaptogenesis. Many small molecules act as agonist or antagonist ligands to Sig1R based on their ability to recapitulate the phenotype of receptor overexpression or knockdown, respectively. Sig1R exists in multiple oligomeric states, and agonist and antagonist are found to have a different impact on the oligomeric form of the receptor. The crystal structure of human Sig1R reveals that both agonist and antagonist ligands share the same binding pocket. However, why agonists and antagonists have distinct activities while binding to the same pocket remains unknown. It is also not clear why binding to a pocket not at the oligomer interface could allosterically affect oligomer formation of Sig1R. Our objective is to gain a molecular-level understanding of how agonist and antagonist ligands allosterically modulate the oligomer interactions differently. Method: An atomistic molecular dynamics (MD) simulation study was employed to investigate how the interface of homotrimer human Sig1R bound to agonist ((+)pentazocine) and antagonist (PD 144418) ligands are allosterically affected. Machine learning algorithms developed by our lab were used to identify the residues that are impacted allosterically. Results: A significant decrease in the interactions between the interface residues of protomer units in agonist bound Sig1R has been found. MM/GBSA and PCA analysis reveal lowered stability of agonist-bound trimer in simulations compared to an antagonist-bound structure. The coordinated actions between the pocket and interface residues depend substantially on the type of ligands present in the binding pocket. The residue response map obtained using machine learning algorithms reflects that the properties of most of the interface residues (T141, H54, H55, G87, L111, H116, R119, A183, D188, S192, Q194, D195, and T198) are affected in different manners. Conclusion: It

is shown that even though agonist and antagonist ligands bound at the same pocket, their ability to allosterically impact the interface residues is significantly different which may lead to lesser stability of high molecular weight oligomers in the agonist bound Sig1R. Our research presents a potential to collaborate MD and machine learning methods to identify the allosteric response of different ligands binding at the same pocket in protein.

The Effects of Surgical Repair Devices in Middle Aged Adults (50-59 Years of Age) with Femoral Neck Fractures

Abstract ID: UNTHSC193 Research Area: Structural Anatomy Presenter: Thomas Roser Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Thomas Roser
- Kashmeera Giga
- Cory Collinge

Abstract:

Purpose: Features of femoral neck fractures vary according to factors including age and mechanism of injury. In older patients (>60 years old), poor bone quality, the inability to limit weight bearing, along with co-morbidities where secondary surgeries may not be tolerated, often limits the utility of fracture repair in favor of replacement. Mechanism of femoral neck fractures in young adults in often higher energy, leading to atypical fracture angles and fracture comminution. Although this presents biomechanical challenges for implants after fracture repair, young adult patients (e.g. < 50 years old) are usually treated with repair as outcomes of arthroplasty in young patients are not well-defined. There remains a "middle-agedâ€□ group of 50-59-year-old patients in which femoral neck fracture mechanism and bone quality is highly variable. Decision for replacement versus repair becomes ill defined and more discretionary action is placed in the hands of the surgeon. Therefore, we asked if there are mechanical considerations in the fracture mechanism and surgical implants used that affect clinical outcomes. Potentially highly impactful decisions are made regarding the hardware and methodology used for augmentation, all of which could contribute to likelihood of success. Methods: This is a retrospective study of patients 50 to 59 years old with a femoral neck fracture treated with surgical repair between 2005 and 2017 at 26 Level 1 trauma centers in North America. A database including approximately 600 patients was evaluated for injury mechanism, internal fixation method implemented, and success of that intervention. Specific mechanical variables analyzed included fracture pattern: (vertical fracture angle, presence of fracture comminution) and stability of fracture repair: (quality of surgical realignment, use of established benchmarks for fracture repair including screw lengths, depths, numbers and placement). Results: Preliminary results following the recent conclusion of data collection indicated that of the 350 qualifying patients for analysis, higher success rates are suggested at 6 months postoperatively in regards to part placement as opposed to the internal fixation device chosen. Conclusion: As data analysis continues, this demonstrates a need for

targeted evaluation and comparison of surgical reduction quality standards in femoral neck fracture repair while controlling for patient co-morbidities in hopes of identifying standard benchmarks of surgical placement. Future impact of this comprehensive database will allow for further investigation on this multifactorial topic.

Role of DNA Methylation in Risk for Cognitive Impairment and Type 2 Diabetes in a Mexican American Cohort

Abstract ID: UNTHSC192 Research Area: Aging / Alzheimer Presenter: Ann Abraham Daniel Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Ann Abraham Daniel
- Talisa Silzer
- Courtney Hall
- Jie Sun
- Zhengyang Zhou
- Nicole Phillips
- Robert Barber

Abstract:

Purpose: Alzheimer's disease (AD) and type 2 diabetes (T2D) are among the leading causes of mortality among the aging Mexican American population (≥ 65 years old) in the US. This cohort is expected to be the largest aging ethnic minority group in the US by 2050. In comparison to their non-Hispanic white counterparts who are most likely to develop AD associated with inflammation, aging Mexican Americans have an earlier onset of AD and metabolism related predisposition for AD. Mild cognitive impairment (MCI) is a phenotype that often leads to AD and is also prevalent in this cohort. The presence of T2D is known to double the risk of developing MCI/AD. The risk for AD, MCI and T2D is multifactorial, involving genetics and epigenetics. Methylation is a form of epigenetic regulation whereby a methyl group is added to the cytosine base in DNA. Methylation patterns in DNA can be affected and possibly reversed by a variety of environmental factors such as lifestyle and diet. Targeting changes to methylation patterns through associated lifestyle changes could be a possible prevention method for AD, MCI and T2D in the future, particularly for minority groups affected by health disparities, such as the Mexican American population. We aim to establish an epigenetic association between cognitive impairment (identified here as AD and MCI), and T2D that is unique to the Mexican American population. Methods: For this project, 551 aging participants from the Texas Alzheimer's Research and Care Consortium (TARCC) were selected, following quality control. A cross phenotype study design will be used to assess differential methylation associated with cognitive impairment (CI) alone, T2D alone and then with both CI and T2D simultaneously. For the first stage of this project, 299 Mexican American and 252 non-Hispanic white participants were stratified into groups of individuals diagnosed with CI alone and controls without CI within each ethnic group. In the

second stage, this cohort will be stratified into individuals with T2D alone and controls without T2D. The third stage will stratify participants into those with both CI and T2D versus normal healthy controls. Lastly, any differential methylation associated with each ethnic group will be compared and contrasted. Peripheral blood drawn from participants was used to obtain individual methylation profiles using the Illumina Infinium MethylationEPIC chip array. Differential methylation will be assessed using the Chip Analysis Methylation Pipeline (ChAMP), limma and cate packages in R. The Beta MIxture Quantile dilation (BMIQ) method will be used for data normalization. Results: Gene set enrichment and pathway analysis tools will be used to analyze results. Conclusions: Identifying methylation sites associated with CI and T2D could contribute towards developing biomarkers that are ethnicity-specific for the Mexican American population and possibly lead towards more effective medical treatment in the future.

Glioblastoma multiforme expresses cell surface PCNA, a potential target for NK cell-mediated immunotherapy.

Abstract ID: UNTHSC190 Research Area: Immunology Presenter: Luke Cooksey Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Michaela Allison
- Porunelloor Mathew Mathew
- Luke Cooksey

Abstract:

Purpose: Glioblastoma multiforme (GBM) is the most common form of primary brain cancer and carries a dreadful five-year survival rate of 9%. Current treatment options include surgery, chemotherapy, and radiation. Recently, there has been a move to pursue immunotherapy options to improve patient outcomes. These therapies often depend on the identification of molecular markers that are distinctive to the tumor cells. Some markers, such as HER2/Neu and EGFR, are overexpressed on a significant percentage of GBM tumors and are used as targets for immunotherapies. However, to address GBM tumors that do not overexpress HER2/Neu and EGFR, our lab set out to identify novel markers on GBM as future candidates for Natural Killer (NK)cell-mediated immunotherapy. Methods: Previously, our lab demonstrated that Lectin-like Transcript-1 (LLT1), membrane-bound Proliferating Cell Nuclear Antigen (PCNA), NKp44 Ligand (NKp44L) and CS1 (CD319) are targets of NK cell-mediated killing of various cancers. Based on these prior studies, we examined their expression on the well-known GBM cell lines LN-229 and LN-18 by flow cytometry using PElabeled antibodies specific for each marker. Results: PCNA was the lone marker of our panel identified to be highly expressed on both LN-229 and LN-18 cells. Conclusions: Based on our results, we concluded that cell surface PCNA is an ideal candidate for NK cell-mediated immunotherapy for GBM. Currently, we are evaluating blocking inhibitory signals to NK cells from the PCNA-NKp44 interaction to target GBM for NK-mediated killing. Recent findings demonstrating the ability to transiently open the blood-brain barrier further increase the feasibility of targeting GBM by NK cells with monoclonal antibodies in the future.

Cytokine Response in an Endotoxin-Mediated Sepsis Model

Abstract ID: UNTHSC187 Research Area: Immunology Presenter: Richard Martinez Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Richard Martinez
- David Salinas Aguirre
- Cooper Warne
- Gregory Dick
- Robert Mallet
- Johnathan Tune
- Lisa Hodge

Abstract:

Purpose: Sepsis is a life-threatening condition that develops secondary to infection and can manifest acute organ dysfunction due to the body's overactive systemic response. Sepsis affects approximately 1.7 million US adults and claims 270,000 lives as a result. The longterm goal of our project is to gain a better understanding of the roles of the lymphatic and immune systems in the progression of sepsis. The purpose of this study is to collect pilot data using a translational swine model of endotoxin-mediated sepsis. We chose a swine model because it closely mimics how sepsis progresses in humans. Sepsis was induced by infusion of lipopolysaccharide (LPS) from Escherichia coli. LPS was chosen because it is a key mediator in the activation of the immune system and the development of sepsis. We hypothesized that the administration of LPS would increase the concertation of the proinflammatory cytokines interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF- \hat{I} ±) in a dose-dependent manner over time. Methods: Yorkshire pigs (61 $\hat{A} \pm 4$ kg, n = 4, 2 male) were sedated, intubated, and ventilated. Thoracotomy was performed under anesthesia to record flow data and sample cardiac blood for use in another study. Femoral artery and venous lines were placed to allow measurement of blood pressure and infusion of LPS. Specifically, LPS was prepared at 1, 5, 25, or 50 \hat{I} /4g/kg (pig body weight) in sterile saline. LPS was infused into anesthetized pigs over a 2-hour period. Blood samples were collected immediately prior to LPS administration and at 30 min intervals during 2 hours of LPS infusion up to 4 hours following LPS infusion. The plasma was analyzed via enzyme-linked immunosorbent immunoassay (ELISA) for the concentrations of IL-6 and TNF- \hat{I} ± using commercially available kits. Results: As hypothesized, the infusion of LPS increased the concentration of the inflammatory mediators IL-6 and TNF- \hat{I} + over time compared to preLPS infusion. Specifically, the greatest increase in IL-6 was seen at 180 minutes in both the 50 and 25 $\hat{1}$ /4g/kg LPS infused pigs. TNF- $\hat{1}$ ± concentration peaked between 30 to 90 minutes during LPS infusion in both the 50 and 25 $\hat{1}$ /4g/kg LPS infused pigs. The lower doses of 1 and 5 $\hat{1}$ /4g/kg LPS produced little to no IL-6 or TNF- $\hat{1}$ ±. Furthermore, we discovered that the pigs who received 50 or 25 $\hat{1}$ /4g/kg of LPS died from septic shock within 180 minutes of LPS infusion, whereas the pigs that received 1or 5 $\hat{1}$ /4g/kg of LPS survived longer. Conclusion: In this study, we identified the impact of increasing the doses of LPS on the production of IL-6 and TNF- $\hat{1}$ ± in swine. Our preliminary results suggest a dose range of 10-20 $\hat{1}$ /4g/kg of LPS may be ideal to study the inflammatory response in this model. The acquisition of these data are essential to pursue our long-term research objective, which is to identify the role of the lymphatic and immune systems during sepsis.

Minimally Invasive Lower Anterior Resections - Better Than Open But Not All The Same

Abstract ID: UNTHSC184 Research Area: Cancer Presenter: Nicholson Brant, MSIII Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Nicholson Brant
- Dr. Joseph Lim
- Drue Apple
- Ronney Stadler
- Marcus Downs
- Rohan Jeyarajah

Abstract:

Purpose: The optimal approach for lower anterior resection (LAR) has been closely debated. The relatively new addition of the robotic approach adds a layer of complexity to this topic. The majority of the literature has compared the possible approaches 2 at a time; however, only a few studies have comprehensively compared all 3 approaches at the same time. Methods: This is a retrospective cohort study of a prospectively maintained database at a non-university tertiary care center. A total of 130 patients underwent open, laparoscopic, or robotic oncological lower anterior resection from 2014 to January 2020. Results: Statistical significance of length of stay (LOS) was noted between the three approaches (p< 0.005) with the mean LOS for open being 8.08 days, laparoscopic being 7.04 day, and robotic being 4.96 days. No statistical significance was noted for estimated blood loss, operating time, or postoperative complications including anastomotic leak, ileus, pneumonia, pulmonary embolism, surgical site infection, and urinary tract infection. Conclusions: No one particular LAR approach demonstrates superiority in regards to perioperative outcome. Postoperatively, robotic LAR has a shorter LOS and appears to be a safe alternative to open and laparoscopic LARs, further bolstering the advocacy of robotic LAR over its counterparts.

Targeting Sp1 in Ewing Sarcoma: A multi-approach method for the utilization of Mithramycin

Abstract ID: UNTHSC182 Research Area: Cancer Presenter: Christoffer Briggs Lambring Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Christoffer Lambring
- Umesh Sankpal
- Riyaz Basha

Abstract:

Purpose: Ewing Sarcoma (ES) is a bone and soft tissue cancer affecting young adults and children. ES mostly occurs in the bones or soft tissue of the arms, legs, and pelvis. Localized ES presents with 5-year survival rate of 70%, but metastatic 5-year survival rate is between 15% and 30%. Our laboratory is interested in combination treatments using less toxic agents to induce sensitization to chemotherapy in ES. The anti-cancer activity of an antineoplastic antibiotic, Mithramycin, against ES cells has been shown. Mithramycin inhibits Specificity protein 1 (Sp1) a marker associated with aggressive cancer cell growth and resistance to chemo/radiation therapies. However, its mechanistic effects on survivin, an anti-apoptotic protein associated with poor prognoses in multiple cancers, are continuing to be elucidated in ES. This studies purpose is to evaluate the effectiveness of Mithramycin and various combinations with other chemotherapeutics, Etoposide and Vincristine, to inhibit ES cell growth and effect various cancer related proteins. Methods: Anti-proliferative activity of Mithramycin and/or Vincristine and Etoposide against ES cell lines, TC205 and CHLA10, was evaluated using CellTiterGlo kit. Dose curves were plotted and IC50 values were determined by Sigma-Plot software. The expression of Sp1 and survivin was determined by Western blot analysis. Cell lines were obtained from Children's Oncology Group (COG). Results: Mithramycin significantly decreased ES cell line viability and showed the ability to reduce the expression of Sp1 and offer differing effects on survivin expression, indicative of antiapoptotic mechanisms being implemented in the ES cell lines. IC50 values of both chemotherapeutics and Mithramycin were decreased by nearly 50% when used in combination and this effect was mirrored in Sp1 expression. Conclusions: Mithramycin may effectively sensitize certain ES cells and improve the response of chemotherapy while lowering necessary effective dosages. Studies to understand the mechanisms of action of Mithramycin on Sp1 and survivin are underway.

Allosteric Modulation of Small-Molecule Drugs on ACE2 Conformational Change upon Binding to SARS-CoV-2 Spike Protein

Abstract ID: UNTHSC181 Research Area: Pharmaceutical Sciences Presenter: Duen-Shian M Wang Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: GSBS Student

Author(s):

- Duen-Shian Wang
- Hamed Hayatshahi
- Vindi Jayasinghe Arachchige
- Jin Liu

Abstract:

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has caused Coronavirus disease (COVID-19) pandemic. Drug repurposing studies, including drugs such as dexamethasone (DEX), chloroquine (CQ), and telmisartan(TLS), have been performed in COVID-19 clinical trials. DEX and CQ have been demonstrated in vitro to bind angiotensinconverting enzyme 2 (ACE2), a cellular entry receptor utilized by SARS-CoV-2. However, how DEX/CQ bind to ACE2 and their mechanisms of action are still unknown. Here we demonstrated that DEX, CQ, and TLS disrupt the interactions between SARS-CoV-2 spike protein and human ACE2 via binding to an allosteric site close to the viral spike protein binding region at the peptidase domain of ACE2, causing a conformational change of the ACE2. We defined four conformational states of ACE2 based on the two helices distances. Our molecular dynamics simulations suggested that binding to the viral spike protein shifted ACE2 conformation populations away from "Open" conformation. Such conformation population shift is further enhanced by the Delta variant. The binding of the drugs to ACE2 rescues this conformation population shift allosterically to keep ACE2 in "Open" conformation mostly. Our findings provide a potential insight that modulating the conformation of ACE2 may prevent SARS-CoV-2 invasion due to unfavored poses for spike protein binding.

Visual Function and Cognitive Dysfunction in Older Adults

Abstract ID: UNTHSC180 Research Area: Aging / Alzheimer Presenter: Mohammad Imran Rashik Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Mohammad Rashik
- Sima Mozdbar
- Subhash Aryal
- Leigh Johnson
- Sid O'Bryant

Abstract:

Background: Studies have shown a correlation between visual impairment and increased risk of Alzheimer's disease (AD). Therefore, it is important to understand the relationship between visual function and cognitive dysfunction in order to improve care and healthrelated quality of life. This study assesses the relationship between self-reported visual function and cognitive dysfunction through the use of two questionnaires, the Mini-Mental Status Exam (MMSE) and the 25 item National Eye Institute Vision Function Questionnaire (NEI VFQ-25). Methods: 131 participants from the Alzheimer's Disease in Primary Care (ADPC) study were recruited to complete the NEI VFQ-25. This questionnaire takes into account multiple domains of health and measures the impact of ocular dysfunction on each of the domains. Before completing the questionnaire, as part of the ADPC study, the subjects underwent neuroimaging and a battery of neuropsychological testing, including the MMSE. Based on clinical dementia rating scale (CDR), MMSE scores and additional cognitive testing, participants were classified into three groups of cognitive impairment. These were: normal control with no cognitive impairment (CDR sum of box score equaling 0), mild cognitive impairment (CDR sum of box score between 0.5 to 2) and Alzheimer's dementia (CDR sum of box score over 2.5). To examine the relationship between cognition and selfreported visual function, we performed a Kruskal Wallis test to assess vision specific role difficulties in the three diagnostic categories. Results: The Kruskal Wallis test revealed a significant difference in role difficulties related to vision among the three diagnostic groups (p = 0.04). This means that as the MMSE score decreased due to cognitive impairments, participants reported greater difficulties in their activities of daily living and completion of tasks due to deteriorating eyesight. Conclusions: An important component during the ophthalmic and neuropsychological evaluation of a patient is the consideration of visual function as it relates to quality of life. The need for the NEI-VFQ questionnaire arises because vision tests cannot comprehensively represent the emotional well-being or social

function of a patient, formally known as the health-related quality of life. Identifying and addressing reduced visual function could play a role in improving the health-related quality of life for patients who are at an increased risk of cognitive dysfunction.
Ruptured Giant Abdominal Aortic Aneurysm

Abstract ID: UNTHSC179 Research Area: Cardiovascular Presenter: Prathyusha Mahasamudram Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Prathyusha Mahasamudram
- Fatema Jafferji
- Logan Heckart
- Kevin George
- Stacy Luka
- Cara Fisher

Abstract:

Abstract Background: An aneurysm is commonly defined as permanent and irreversible localized dilation of a vessel. Any aneurysm located in the infradiaphragmatic aorta could be clinically known as an abdominal aortic aneurysm (AAA), but this classification is typically limited to aneurysms of the infrarenal aorta rather than suprarenal aorta. Literature varies on the exact definition of AAA, but common definitions include vessel dilation of at least 150% compared to relative normal diameter of the artery, as well when the infrarenal aortic diameter is expanded greater than 3.0 cm. The infrarenal aortic aneurysm is the most common type of AAA with a frequency of 65%, but aneurysms do occur at other locations along the aorta. AAA's are also classified by their shape as either fusiform, which are expanded circumferentially, or as saccular, which are expanded in a spherical, but more localized manner. The greater the diameter of the AAA is versus the normal diameter at the level of the renal arteries, which is approximately 2.0 cm, the greater the risk of rupture. An AAA that is greater than 8.0 cm is estimated to have a 30%-50% chance of rupture according to the Joint Council of the American Association for Vascular Surgery. Case Information: During a routine cadaveric dissection, a AAA was identified in an 86-year-old Caucasian male, whose cause of death was documented as senile degeneration of the brain. The donor was 6'0â \in and 186 lbs (BMI = 25.2). He had a history of heart disease and chest pains. The aneurysm was discovered after noting evidence of significant bleeding in the retroperitoneum in the form of a blood clot. The blood clot itself measured 37.55 cm in transverse diameter and 22.35 cm in height. Removal of the blood clot revealed the aneurysm, which measured 10.82 cm in transverse diameter and 11.28 cm height. Conclusion: Documentation of this case adds to the current literature and understanding of AAA's of this size. With a transverse diameter greater than 10-13 cm, the identified AAA would be classified as a giant AAA. Bleeding from the rupture of this large aneurysm

involved foregut, midgut, and hindgut structures. The inferior mesenteric artery, a branch of the abdominal aorta, which supplies the distal â..." of the transverse colon, descending colon, sigmoid colon, and the superior rectum was the most impacted. Other nearby arteries were also affected and damaged. Furthermore, we are able to note associations between the patient's medical history and the likelihood of development and rupture of an abnormal AAA. Increased risk for AAA is associated with ethnicity, age, sex, renal cysts, smoking history, CHD, and more. Our findings indicate that close follow-up with patients with increased risk-factors for AAA would be beneficial.

Assessing the Utility of the Project ECHO Platform in Advancing the Knowledge, Skills and Abilities of the Healthcare Workforce to Improve the Health of Older Adults

Abstract ID: UNTHSC176 Research Area: Education Presenter: Jessie Ausman Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Jessie Ausman
- Roslin Jose
- Jennifer Severance
- Susanna Luk-Jones
- Sarah Ross

Abstract:

Purpose: The population of older adults aged 65+ years is expected to increase by 262.9% from 2010 to 2050, thus significantly straining the geriatric care and long-term care (LTC) workforces. In addition to this, the COVID-19 pandemic has exacerbated existing strains placed on these workforces. To address these issues, the University of North Texas Health Science Center (UNTHSC) Center for Older Adults partnered with the Extension for Community Health Outcomes (ECHO) Institute to develop training and education for the LTC and geriatric care workforces. Methods: UNTHSC hosted weekly Nursing Home STRONG (NHS) ECHO training sessions targeted to LTC staff and bi-weekly Geriatrics ECHO training sessions targeted to geriatric providers. Virtually delivered NHS sessions featured specialistled didactic presentations followed by interactive breakout discussions surrounding dementia care, IPC, workforce considerations, quality improvement, and age-friendly healthcare. Geriatric ECHO sessions followed a slightly different format; specialist-led didactic presentations were generally shorter with more time devoted to case study discussions. Topics covered during the Geriatric ECHO sessions included various aspects of dementia and cognitive impairment. Participants in both the NHS and Geriatric ECHO programs completed post-session surveys to track changes in knowledge, skills, and abilities using a five-point Likert scale. NHS participants completed a single post-session survey, while Geriatric ECHO participants completed bi-weekly surveys following the completion of each didactic session. Results: Between September 2021 and November 2021, 54 unique attendees representing 35 LTC organizations from 20 counties participated in NHS ECHO sessions. Importantly, 9 of the counties (45%) reached by the NHS ECHO

were rural. A total of nine, 1-hour sessions were presented with an average of 17 attendees (excluding staff/facilitators), primarily including administrators (29.6%) and nurses (29.6%). Post-session respondents (n=10) "strongly agreedâ $\in \Box$ that their knowledge of approaches to meet resident healthcare needs improved (90%), their knowledge of IPC improved (80%), and their ability to care for residents improved (80%) after attending at least one session. During this same time-period, 48 unique attendees representing 21 organizations participated in Geriatric ECHO sessions. A total of four, 1-hour sessions were presented with an average of 12 attendees, primarily including physicians (35.4%) and nurses (12.5%). Post-session responses indicated that majority of respondents "strongly agreed $\hat{\mathbf{e}}$ that the session provided practical suggestions that can be applied in their practice (66.7 - 84.2%), the didactic topic was relevant to their learning needs (74.1 -86.4%), and the case discussion was relevant to their learning needs (70.4 $\hat{a} \in 86.4\%$). Conclusions: Amidst various factors that increase burden on the healthcare workforce, the Project ECHO model offers an innovative virtual platform to adequately prepare diverse healthcare workforces to care for an aging population. This model has strong potential to improve future healthcare training and quality especially due to two unique features; collaborative, discussion-based instruction and the capacity to reach diverse and rural populations. Post-session survey responses suggested that the knowledge, attitudes, and skills of ECHO participants were improved via attendance in the NHS and/or Geriatric ECHO sessions.

Longitudinal Survey Examining Impact of COVID19 on AA with HIV

Abstract ID: UNTHSC175 Research Area: Health Disparities Presenter: Yesha Patel Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Olagoke Sule
- Yesha Patel
- Chukwuezugo Oranu
- Jennifer Cooper
- Kathleen Borgmann
- Soma Afrasiabian
- Marc Fleming
- Deidra Lee

Abstract:

The impact of COVID-19 has been devastating. It increases the risk for individuals with chronic health conditions type 2 diabetes, obesity, and HIV. In addition, research has shown among individuals with comorbidities, African Americans have a higher prevalence and poorer prognosis of COVID-19. Non-medical factors (e.g., social determinants of health) are key drivers of health outcomes and inequities. Patient-reported health outcomes expounded by social determinants of health depict how vulnerable populations are faring over a year into the pandemic. Therefore, our goal was to assess the impact of the pandemic on African Americans living with HIV as it relates to social determinants of health. A longitudinal survey employing face-to-face interview questions was used to address the study objective at three-time points. Participants were part of an ongoing study to examine the impact of medication therapy management visits on patients' health. The inclusion criteria for the study were adults \hat{a} ‰¥18 years, the presence of hypertension or diabetes, and a positive HIV diagnosis being managed by anti-retroviral therapy. Participants selected for the presented study met the original inclusion criteria and had study visits within the time points defined as pre-COVID, during COVID, and post-COVID. Participants were excluded if they didn't have study visits within three-time points or inclusion criteria. Ten questions that examined social determinants of health and overall well-being were extracted from the survey used at each study visit. Participants met with pharmacists approximately every three months per the study protocol. Descriptive statistics and inferential statistics were used to analyze survey responses. A proportional odds mixed-effects logistic regression model assessed differences between time points. The last six questions were dichotomized

due to data skewness. This study was approved by the University of North Texas Health Science Center's Institutional Review Board (IRB). A total of 27 participants were included. The average age of participants was 53. Participants' responses to the survey questions were fairly consistent across all three time points. The mean response to the questions increased (more favorable) from time point 1 to time point 2. The means were higher between time point 2 and time point 3. There was a significant difference between time point 3 and time 1 (odds ratio [OR] = 16.39, 95% CI [1.08-37.73], p= 0.04), regarding the statement "In the last month, I felt like my safety was threatened because of the place I sleep or live." A greater proportion of participants reported a score of 5 on this question, indicating they strongly disagreed with the statement. The results showed a statistically significant difference in participants feeling safer where they resided or slept post-COVID than pre-COVID. This perhaps can be explained by the rent and mortgage moratoriums, and housing protections provided by the Coronavirus Aid, Relief, and Economic Security (CARES) Act. Future research priorities should include the benefits of pharmacist-driven MTM in evaluating social determinants of health, and medication needs to inform public health goals and policy implementation better.

Two Siblings with Primary Hypothyroidism and Diabetes Secondary to a Novel GLIS3 Variant

Abstract ID: UNTHSC174 Research Area: Pediatrics & Women's Health Presenter: Sarah Andrade Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Sarah Andrade
- Alejandro De La Torre
- Luke Hamilton
- Don Wilson

Abstract:

Background: Congenital hypothyroidism (CH) is a common endocrine disorder. GLIS3 is a nuclear protein that activates and represses transcription in many tissues beginning in embryogenesis. Additionally, diabetes mellitus may present in varying stages of life as Type 1 Diabetes (autoimmune), Type 2 Diabetes (insulin resistant), or monogenetic. In this case presentation, we present two siblings with hypothyroidism, presumably present from birth, and diabetes secondary to a novel GLIS3 variant. Case Presentation: An 8-year-old male born to consanguineous parents presented for care after immigrating to the United States. Key findings included developmental delay since birth, short stature, and calf hypertrophy. A brain MRI, thyroid ultrasound, and a cytogenic SNP microarray found goiter and nondiagnostic runs of homozygosity on chromosomes 9 and 13. Thyroid function tests (TFT) revealed an elevated TSH (143.41 mIU/L, reference range: 0.5-4.30 mIU/L) and very low free T4 (0.2 ng/dL, reference range: 0.9-1.4 ng/dL). Initiation of levothyroxine improved height and calf hypertrophy. Subsequently, he presented with polyuria, polydipsia, weight loss, hyperglycemia (170 mg/dL, reference range: 70-100 mg/dL), and an elevated HbA1c (12.8%, reference range: 4.2-6.3%) consistent with diabetes mellitus. Low doses of insulin maintained control of symptoms. Maturity onset diabetes in youth (MODY) genetic testing and diabetes-related antibodies were negative. Subsequently, his 2-week-old female sibling presented with low birth weight, hyperglycemia (251 mg/dL, reference range: 50-96 mg/dL), extremely elevated TSH (>500 mIU/L, reference range: 0.8-8.20 mIU/L), and low free T4 (0.23 ng/dL, reference range: 0.9-1.4 ng/dL) consistent with neonatal diabetes (NDM) and CH. Levothyroxine and diluted insulin were initiated. Comprehensive neonatal diabetes gene analysis confirmed a pathologic GLIS3 variant (c.728dup). This prompted reflex GLIS3 testing in the older sibling, revealing the same GLIS3 variant. Abdominal and renal ultrasounds revealed kidney abnormalities in both siblings. TFT remained normal with levothyroxine in both siblings. The older brother has continued to require insulin at very low

doses for his body weight. The younger sister required diluted insulin until she was 8months-of age, at which time she remained euglycemic without requiring insulin. Conclusions: GLIS3 encodes for a transcription factor located at 9p24. Variants of GLIS3 that affect temporal and/or tissue-specific gene expression may result in a variety of clinical phenotypes, which include CH, NDM, intrauterine growth retardation, developmental delay, renal disease, and others. CH and NDM have been reported in 21 previous cases of GLIS3 variants. We add two new cases to the literature, describe how their diagnosis was reached, the varying phenotypic expressions, and responses to therapy. Continued research is needed to identify the spectrum of phenotypes associated with GLIS3 variants and further understand its association with diabetes and hypothyroidism.

Racial disparities in the effectiveness of treatment of Her2 positive breast cancer as measured by pathological complete response

Abstract ID: UNTHSC172 Research Area: Cancer Presenter: Callie Angell Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Callie Angell
- Jolonda Bullock
- Anna Diaz
- Riyaz Basha
- Kalyani Narra

Abstract:

Purpose: Pathologic complete response (pCR) is a surrogate marker for long term survival that can be used to evaluate neoadjuvant chemotherapy. It has been shown in a previous study that black breast cancer patients have lower pCR rates than non-Hispanic white (NHW) patients, particularly in the hormone receptor (HR) negative Human epidermal growth factor receptor 2 (Her2) positive subtype. Because John Peter Smith Hospital (JPS) has a high proportion of black patients, making up about 30% of their breast cancer patients in particular, further research on racial disparities in the treatment of Her2 positive breast cancers is needed. Methods: This retrospective study was conducted to investigate the pCR rates of Her2+ breast cancer patients treated with neoadjuvant trastuzumab based regimens. Data was obtained from the institutional registry of the JPS Oncology and Infusion Center in Fort Worth, TX. Eligible patients were diagnosed with Her2 positive breast cancer between 1/1/2016 and 12/31/2019 and underwent neoadjuvant trastuzumab based chemotherapy. Information on treatment regimen, diagnostic stage, and ER and PR status were collected as well as demographic information. pCR was collected from pathology reports from the JPS Department of Pathology and was defined as ypT0/isypN0. Results: JPS had 45 eligible patients for this study: 12 NHW, 15 black, and 11 Hispanic. 40 of the 45 patients were treated with docetaxel, carboplatin, trastuzumab, and pertuzumab, of which 21 achieved pCR. 4 of the other 5 patients who received different combinations including trastuzumab achieved pCR. Of all 45 patients, 25 achieved pCR; 8 NHW, 7 Black, and 6 Hispanic. For HR negative patients, 3 of 4 NHW, 1 of 5 black, and 3 of 5 Hispanic patients achieved pCR, for a total of 9 out of 17 patients. Conclusion: This study was limited by the number of eligible patients and should not be extrapolated to larger populations, but it shows how disparity is present in this urban safety net hospital. At JPS, only 47% of black

patients and 55% of Hispanic patients achieved pCR compared to 67% of NHW patients. For HR negative cases, black patients were even less likely to achieve pCR. More research on the treatment of breast cancer for different races is necessary because they are not experiencing the same results. Studies in this area are limited and earlier trials (NEOSPHERE and TRYPHAENA) had very low numbers of black patients and did not recruit Hispanic patients. Further investigations are warranted to understand the differences between ethnicities in treating Her2 positive breast cancer. The research reported in this publication was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number (R25HL125447).The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Factors Associated with Pain Sensitivity and its Impact on Long-Term Outcomes in Patients with Chronic Pain: A Retrospective Cohort Study

Abstract ID: UNTHSC171 Research Area: Rehabilitative Sciences Presenter: Jennifer Beal Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Jennifer Beal
- Nicole Fakes
- Breanna Herron
- Colleen Jacobs
- Aditi Vasudevan
- John Licciardone

Abstract:

Purpose Low back pain is estimated to affect 632 million people globally and treatment of back and neck pain in the United States costs upwards of \$100 billion annually. Major clinical practice guidelines have been established for chronic pain in general, and for chronic low back pain (CLBP) in particular, with non-pharmacological and non-opioid therapies as first-line treatments. Nevertheless, these guidelines do not address how pain sensitivity may influence treatment. Pain sensitivity may be defined as the perception of pain in different situations, which varies from person to person. This study aims to determine if pain sensitivity is associated with long-term outcomes relating to low back pain intensity, backrelated disability, and health-related quality of life in patients with CLBP. Methods Participants with CLBP were recruited from the Pain Registry for Epidemiological, Clinical, and Interventional Studies and Innovation (PRECISION Pain Research Registry) from April 2016 through December 2021. Pain sensitivity was measured for each participant using the Pain Sensitivity Questionnaire (PSQ), wherein scores range from 0 (least pain sensitivity) to 10 (greatest pain sensitivity). Participants were subsequently classified as having low (PSQ score \hat{a} ‰×4) or high (PSQ score >4) pain sensitivity based on a median split. The primary outcomes were measured at quarterly encounters over 12 months, and included low back pain intensity measured with a numerical rating scale, back-related disability measured with the Roland-Morris Disability Questionnaire, and health-related quality of life measured with the SPADE cluster (sleep disturbance, pain interference, anxiety, depression, and low energy/fatigue) derived from the Patient-Reported Outcomes Measurement Information System. Multiple logistic regression was initially used to predict participant characteristics associated with high pain sensitivity. Longitudinal outcomes over 12 months were then

compared according to pain sensitivity level using repeated measures analysis of variance, while simultaneously controlling for potential confounders using propensity scores. Results The strongest predictors of high pain sensitivity were being Black (OR, 6.43; 95% CI, 4.01-10.32; P< 0.001) and having high pain catastrophizing (OR, 3.11; 95% CI, 2.09-4.62; P< 0.001). High pain sensitivity was associated with greater overall levels of low back pain intensity (P< 0.001), back-related disability (P< 0.001), and health-related quality-of-life deficits (P< 0.001). However, after controlling for confounding variables, only the findings for pain intensity remained significant (P< 0.001). Conclusions High pain sensitivity is associated with greater low back pain intensity (but not with back-related disability or health-related quality of life) after controlling for confounding variables. Being Black and having high levels of pain catastrophizing were highly significant predictors of high pain sensitivity. The latter finding has important implications for rehabilitation of patients with chronic pain, as it highlights the importance of interventions that address patient pain catastrophizing, pain sensitivity, and ultimately adverse health outcomes. Physicians should be aware of how they can improve long-term chronic pain outcomes by addressing the patient's mental state relating to pain, as well as using other more conventional approaches to pain management.

Hemolytic Uremic Syndrome and Gallbladder Disease in Pediatric Patients

Abstract ID: UNTHSC170 Research Area: Pediatrics & Women's Health Presenter: Kailey Nguyen Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Kailey Nguyen
- Avani Bellary
- Tyler Hamby
- Julie Barrow
- Randa Razzouk

Abstract:

Background Hemolytic uremic syndrome (HUS) is a common condition in pediatric patients, and it may manifest with many gastrointestinal symptoms, such as abdominal pain, vomiting, and diarrhea. There is increasing reason to believe that this condition also affects the gallbladder. We report on the frequency of gallbladder disease in pediatric patients who were diagnosed with HUS in our hospital over a 20-year period. Methods Electronic medical records were examined for all patients aged 0-21 years who were diagnosed with HUS between January 2000 and April 2021 and had abdominal imaging performed at Cook Children's Medical Center. To be included, patients had to have had abdominal imaging around the time of HUS diagnosis. Records of patients meeting inclusion criteria were reviewed for information related to HUS diagnosis, gastrointestinal disease, and signs of gallbladder disease. Basic descriptive analysis was used to explain the characteristics of the study population, including frequency and percentages for nominal variables and medians and ranges for non-nominal variables. Results Seventy-nine patients met inclusion criteria. Of these, 69 (87%) patients suffered from gastrointestinal diseases or symptoms. Thirtythree (42%) patients had signs of gallbladder disease, and 86% of these signs occurred within 1 week of HUS diagnosis. The median time from HUS to gallbladder disease was 1 day. Conclusions The present study is the first to systematically study the link gallbladder disease with HUS in pediatric patients, and it provides strong evidence for a connection. Though the current mechanism of this disease association is still unknown, the hemolytic process during HUS is thought to be the underlying cause for gallbladder disease manifestations. It is our recommendation that physicians should consider performing abdominal imaging when HUS is being considered as a differential diagnosis.

OMT as an Effective Treatment for Patients with Long-Term Postoperative Complications: A Case Study

Abstract ID: UNTHSC168 Research Area: Physical Medicine / OMM Presenter: Khanh Ta Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Khanh Ta
- Trishangi Malla
- Lesca Hadley

Abstract:

Background: Prior studies have shown how Osteopathic Manipulative Treatment (OMT) performed on patients with non-emergent, undifferentiated chest pain can offer relief as a supplement to allopathic medicine. Previous surgery or trauma to the chest, abdominal, or pelvic regions commonly produces somatic dysfunction which can worsen existing cardiovascular conditions. However, little information exists regarding the effect of OMT in the long-term postoperative recovery of these patients. In 2021, medical students at a mobile clinic in Sanderson, TX provided healthcare screenings and OMT to patients in underserved rural communities. Case Information: A 71-year-old Caucasian female presented to the clinic with 1 week of dyspnea and chest heaviness, worsening within 24 hours prior to her visit. The patient reported progressive epigastric pain that radiated upwards, generalized myalgia, bilateral lower extremity paresthesias, and decreased urination. Her past medical history was significant for coronary artery disease, hypertension, GERD, chronic kidney infections, sinus infections, dural hematoma, hypothyroidism, osteoarthritis, and nose carcinoma. She has a history of two previous stent placements in 2019, a dural hematoma surgery in 2021, a tonsillectomy, and a tubal ligation. Current medication use included baby aspirin, lisinopril, metoprolol, levothyroxine, rosuvastatin, and Zyrtec. The epigastric pain did not improve with pain medications. On admission, vital signs showed a HR of 61bpm, BP of 142/78, and temp of 97.8F. Physical exam revealed regular rate and rhythm without bruits, gallops, or murmurs. PMI was displaced laterally indicating possible ventricular dysfunction. Radial, Dorsalis Pedis, and posterior tibial pulses 2+ bilaterally, extremities were warm to touch. Lungs were CTA bilaterally. Additional physical exam findings include severe RUQ pain with no visible masses or abdominal distension. Gallbladder ultrasound was negative for gallstones, with some wall thickening. Cardiac ultrasound was performed which revealed ventricular and septal hypertrophy, reduced LV function by 50%, and reduced ejection fraction by 50%. Given her chest discomfort and potential causative somatic dysfunctions, an osteopathic exam was performed, and anterior

thoracic tender points were found at AT3 and AT8. Rib examination revealed a significant right ribs 8-10 inhalation dysfunction which was then treated with OMT, specifically Muscle Energy. The patient had immediate relief of symptoms after the treatment and reported nearly complete resolution of her pain. Conclusions: This report illustrates the use of OMT to beneficially alleviate symptoms of dyspnea and severe epigastric pain in a patient with a history of coronary artery disease and multiple invasive surgeries, including coronary revascularization. Somatic dysfunction of the thoracic cage can significantly worsen existing cardiac symptoms and present very similarly to acute myocardial infarction. This case suggests that OMT should be considered in the management of future patients who are experiencing complications in the years following their surgery to improve patient outcomes.

The Hypertrophic Septal Papillary Muscle

Abstract ID: UNTHSC167 Research Area: Cardiovascular Presenter: Nedeke Ntekim Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Nedeke Ntekim
- Alex Nazzal
- Shayrin Oad
- Tarun Palapati
- Cara Fisher

Abstract:

Background: The septal papillary muscle (SPM) is one of three papillary muscles found in the right ventricle of the heart (the others are the anterior and posterior papillary muscles). Typically, the SPM arises from the interventricular septum and attaches to the chordae tendineae of the anterior and septal cusps of the tricuspid valve, although it can differ greatly in its location and morphology. The SPM has been found anterior to the septum, posterior to the septum, and laying centrally in the septum. One study also showed that a typical SPM originates from the upper one-third of the ventricle (81.25%) and attaches to chordae tendineae. In another study, it was found that the SPM was absent in around 22% of the hearts that were examined. The SPM has also been found to come off the top third of the wall of the ventricle and has a shape that resembles a cone. The average SPM in the aforementioned study had a mean measurement of 0.95 cm in length and 0.59 cm in width. Along with the other papillary muscles, the SPM functions to keep the tricuspid valve in position and closes the tricuspid valve to prevent the regurgitation of blood from the right ventricle back into the right atrium. In surgeries designed to correct ventricular septal defects, the SPM serves as a landmark for the right bundle branch within the right ventricle. Case Information: During a cadaver dissection in the anatomy lab for first-year medical students, a hypertrophic SPM was found in the right ventricle of a 67-year-old male. The SPM arose from the interventricular septum, attaching to the chordae tendineae and atypically to the anterior wall of the right ventricle. Using digital calipers, the width of the donor's SPM was measured to be 0.456 cm, while the length was measured to be 3.246 cm. Conclusion: Although the morphology of the SPM is quite variable, the one found in our donor is a unique variant because of its length and location. One study found the mean length of the SPM to be 0.51, 0.65, and 0.81 cm in three groups of adults at progressively older ages, adding to the conclusion that the SPM enlarges with age. The length of the donor's SPM in this case is approximately 340% longer than the average SPM. The

attachment of the SPM to the anterior ventricular wall in this case is also unusual, even among common variants. Information on these variants of the SPM could prove useful in the identification of diseases and surgical operation within the right ventricle.

Large Endometrioma of the Ovary - a case study

Abstract ID: UNTHSC166 Research Area: Pediatrics & Women's Health Presenter: Hasnain Bherwani Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Hasnain Bherwani
- Melanie Lagomichos

Abstract:

Background: Endometriosis is a chronic condition characterized by pelvic pain, dysmenorrhea, and infertility that affects 6-10% of women of reproductive age. It is thought to be caused by retrograde menstruation leading to implantation of endometrial stroma to the peritoneum. Clinical presentations of endometriosis are varied, with symptoms such as dysmenorrhea and adnexal masses being common. Adnexal masses can be evaluated with transvaginal ultrasounds and MRI, but the only conclusive diagnosis is surgery and biopsy. Endometriomas are ovarian cysts that form endometriotic lesions. They can be painful and lead to infertility, and also have a small chance of malignancy. Tumor marker levels of CA-125 can be increased in both benign and malignant endometriomas, and malignancy can only be ruled out with biopsy. The primary treatment for endometriomas is removal, as drainage is associated with a high rate of recurrence. Case information: A 38-year old female was referred to the clinic for evaluation of an adnexal mass. She complained of pelvic pain, dysmenorrhea and abnormal uterine bleeding on initial presentation. Abdominal MRI revealed a multilocular right adnexal mass measuring 13.5 x 10.4 x 11.2 cm with a small amount of surrounding fluid. Tumor markers drawn were found to be elevated. The patient had a follow up 8 months later and transvaginal ultrasound revealed the mass had enlarged to 19.36 x 13.30 x 13.06 cm. Total laparoscopic hysterectomy with bilateral salpingo-oophorectomy was performed and a 20 cm right adnexal mass consistent with ovarian endometrioma containing 1240 mL of endometriotic fluid was evacuated. Conclusions: Endometriomas are one of the most common ovarian masses in women of reproductive age, present in 17-44% of women with endometriosis. They are rarely above 10-15 cm in diameter, and current studies show that only endometriomas over 4 cm in diameter should be surgically removed. Despite being so common, diagnosis is difficult to get certain because most adnexal masses cannot be definitively diagnosed without a biopsy. Other possible causes of adnexal masses include ovarian cysts, ectopic pregnancy, fibroids, ovarian cancer, and pelvic inflammatory disease. There is currently no effective screening tool for ovarian masses. Often screening is done by transvaginal ultrasound and serum levels of CA-125, an ovarian tumor epithelial growth

marker. Endometriomas can cause high levels of CA-125, leading to false positives of ovarian cancer. Other conditions that can cause high levels of CA-125 in the absence of malignancy are menstruation, pregnancy, pelvic inflammatory disease, and benign pelvic tumors. Removal of endometriomas can be complicated for women that want to reproduce because it can damage ovarian tissue. Because the definitive diagnosis of endometriomas and adnexal masses is difficult, a need exists to develop a type of screening tool for ovarian masses before they progress to a point where surgery is required. CA-125 levels are not a reliable measure of malignancy as many non-malignant conditions can create false positives. Potential benefits of early screening include identification of ovarian tumors and prevention of unnecessary surgery, especially in reproductive age women.

Myalgic Beckers Muscular Dystrophy Due to an Exon 15 Point Mutation: Case Series and Literature Review

Abstract ID: UNTHSC165 Research Area: Neuroscience Presenter: Zachary Tavallaee Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Zachary Tavallaee
- Tyler Hamby
- Warren Marks

Abstract:

Background: Dystrophinopathies result from mutations to the DMD gene. Presentation varies from asymptomatic elevations in creatine kinase levels to early loss of ambulation and significant impairment as seen in Duchenne's muscular dystrophy. We report 5 boys in 3 families with heterogenous phenotypes due to a point mutation in the DMD gene: a hemizygous tyrosine-to-cysteine change in exon 15 (c.1724T>C) resulting in an amino acid substitution of leucine to proline at codon 575. The specific mutation on DMD c.1724T>C (p.Leu575Pro) is listed in the Clinvar database as a variant of unknown significance. Our report provides contributing evidence that this genetic alteration should be classified as pathogenic. Case Information: Our 3 patients above the age of 2 years presented with elevated creatine kinase levels, myalgia after exercise, and occasional muscle cramping. Our 2 patients below the age of 2 years presented with elevated creatine kinase levels and no other findings. This mutation has been reported before, with 3 prior patients presenting with similar clinical findings of myalgia, myoglobinuria, and occasional muscle cramping. Some similarities among all 8 patients include elevated creatine kinase levels, no muscle weakness, no calf hypertrophy, and no Gower sign. Discussion: Of note, these patients can present initially with elevated liver function enzymes, as seen with 1 of our patients, and our report raises awareness that dystrophinopathies should be considered before undergoing costly gastrointestinal testing. Two of the 8 patients presented with neuropsychiatric disorders: 1 with attention-deficit/hyperactivity disorder (ADHD) and 1 with autism. This suggests that ADHD and autism may be a presenting feature of dystophinopathies, and creatine kinase levels should be considered in their evaluation. This report elucidates the clinical presentation of the mutation on DMD c. 1724T>C.

A Country-level Comparative Study on Knowledge, Perception and Readiness towards Drone-based Dengue Surveillance System

Abstract ID: UNTHSC164 Research Area: General Public Health Presenter: Esther Annan Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Esther Annan
- Jinghui Guo
- Ubydul Haque

Abstract:

Drone use in the health sector may serve the purpose of surveillance and monitoring of Aedes mosquitoes. However community concerns about drone use around homes may potentially affect the effectiveness of a drone surveillance program. This study aimed to address the gap in knowledge, readiness and perception about how individuals may respond to drone use for rapid alert systems. A cross-sectional study was conducted in three countries; Mexico, Turkey, and Malaysia and data were analyzed using SAS, Python, and R. Comparisons were made within and across countries and tested for statistical significance. The survey comprised of 1,826 participants, in Malaysia (619), Mexico (605), and Turkey (602). Of the three countries, Turkey had the lowest knowledge scores about mosquito-borne diseases. Compared to individuals living in Turkey, people living in Mexico had 14.3 (p < 0.0001) times higher odds and Malaysians had 4.0 (p = 0.7030) times the odds of being willing to download a mosquito surveillance app. About 75%, 78% and 32% of residents in rural Mexico, Turkey and Malaysia respectively, expressed no concern for the use of drones around homes for surveillance purposes. An individual's willingness to be trained and acceptance of drone use in mosquito-endemic countries may help to further discussions and application of mosquito surveillance using drones. Privacy concerns may be addressed through the enforcement of drone regulatory standards.

Chronic Ventral Hernioplasty Mesh Infection with Enterocutaneous Fistulae: Operative Treatment of a 62-Year-Old Female with a History of Extensive Abdominal Surgery

Abstract ID: UNTHSC162 Research Area: General Medicine Presenter: Lendon Hall Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

• Andrew Hall

Abstract:

Background: Enterocutaneous fistulae (ECF) are abnormal communications between the small or large bowel and the skin. They arise as complications of abdominal surgery, in this case years after intraperitoneal polypropylene mesh placement during ventral hernia repair. Surgical management of infected hernia mesh entails en bloc removal of the infected mesh with the adjacent fistula tract. Case Information: A 62-year-old Hispanic female presented to the general surgery clinic for evaluation of an ECF in the context of chronic ventral hernia mesh infection. The patient had an extensive abdominal surgical history that included two cesarean sections, hysterectomy, three ventral hernia repairs, a sigmoid colectomy, a laparoscopic adjustable gastric band, and a cholecystectomy. The patient noted a fistula formed two years prior and eventually closed spontaneously. 4-5 months prior, the fistula opened again with pain and pasty discharge requiring dressing changes every 2-3 hours. Upon evaluation in the clinic, the patient had infected intraperitoneal mesh with an enterocutaneous fistula. Given the patient's good nutritional status, en bloc excision of the infected mesh and ECF with small bowel resection and abdominal wall closure was planned and performed. During surgery, mesh was identified and noted to be extending across the abdominal wall and the enterocutaneous fistulae were noted. The small and large bowel were densely adhered. Extensive lysis of adhesions using Metzenbaum scissors was performed. Small bowel that was proximally and distally attached to the mesh was identified. The mesh was bisected at midline to facilitate dissection. The infected mesh along with the ECF were removed. Primary hand-sewn side to side anastomosis was performed to repair the defect. The small bowel anastomosis was brought together by approximating the sides. A two-layer anastomosis was created using Lambert and Connell stitches, and the peritoneal cavity was cleaned and closed. The patient was awakened and taken to the PACU in stable condition. The patient's post-op course was complicated by fascial dehiscence requiring multiple laparotomy reopenings, revision of anastomoses due to perforations, further small and large bowel resections due to non-viability, colostomy, mesh placement to

cover the open abdominal defect, and several wound VAC replacements. The patient remained stable and continued to receive wound VAC replacements every three days until she was discharged to a skilled nursing facility several months after the hernia mesh was removed. Discussion: Hernia repair mesh that is placed inside the peritoneal cavity has a propensity to cause catastrophic long-term problems such as the ECF presented in this case. Mesh placement between abdominal wall layers, i.e. retrorectus or preperitoneal placement, has been shown to reduce infection and hernia recurrence rates compared to intraperitoneal placement. Patients need to be made aware of the risks of intraperitoneal mesh placement and surgeons need to be encouraged to take the time to prevent these tragic outcomes by improving the hernia repair technique.

Effects on Stroop performance pre-and post-participation in the self management brain health coaching program

Abstract ID: UNTHSC161 Research Area: Aging / Alzheimer Presenter: Srijaa Kannan Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (4th Year)

Author(s):

- Srijaa Kannan
- Sarah Ross
- Mary Quiceno
- Jennifer Severance
- Roslin Jose
- Emily Clark

Abstract:

Purpose: About ¼ of adults age 65 and older develop cognitive impairment without dementia. Of those who live past 85, 1/3 will develop some form of dementia. Currently, there is no cure for dementia. While developing dementia may eventually be unavoidable, various factors contribute to the onset of dementia including lifestyle choices. Modifiable risk factors related to lifestyle can be addressed through health coaching. The purpose of this study is to implement a program that supports participants in making lifestyle changes that will help them function optimally now, and promote brain health and cognitive functioning in the future to help reduce their risk of developing dementia. Methods: This is a longitudinal study design in which participants are measured multiple times throughout their participation. Health coaching, education, and targeted assessments with feedback are used to provide a personalized approach to addressing brain health. Program participants received in-person health coaching across a 3-month period. Study participants must be ≥18 years of age, with no dementia or uncontrolled psychiatric illness. Participants complete survey assessments for each of the seven pillars of Brain Health: Diet, Exercise, Social Engagement, Cognitive Activity, Sleep, Mindfulness & Outlook, and General Health. Additional information collected includes demographic information and assessments of cognition. The Stroop test is a cognitive assessment that measures attention, executive functioning, and processing speed. The Stroop test was performed prior to the start and upon completion of the program; pre and post participation results were evaluated for correlations. Results: Of the 36 participants who enrolled and completed the pre-surveys for the program, 25 progressed to participate in health coaching visits with personalized brain health lifestyle goals. The average age of participants is 76. 80% of the participants are female and 94% are Caucasian. The majority of participants chose improving cognitive

activity as their area of focus. Feedback from those who completed the program has been positive. Participants stated that the program length met their need for implementing change, they would recommend the program to others, and they had positive experiences with the health coach. All participants who have completed the program to date have shown an improvement in the Stroop Test raw scores for words and colors comparing the initial intake visit to the closure visit. 50% of participants showed some improvement in the colorword raw scores. Conclusion: Participants in the self-management program for brain health show improvements in attention, executive functioning, and processing speed as measured by their performance on the Stroop test. As individuals make improvements in the seven pillars of brain health, they can expect optimization of cognitive functioning and risk reduction for developing dementia. The program allows individuals to focus on the areas of most importance to them, which contributes to their success. Recommendations for future studies includes tracking participants longitudinally with an aim to assess program benefit in preventing and delaying the onset of dementia.

Effectively recruiting for Family-central "E-health" research: Lessons from the Lifestyle Medicine Health Education and Intervention Program Study at a Pediatric Mobile Clinic

Abstract ID: UNTHSC159 Research Area: General Public Health Presenter: Benjamin Lewis Trammell III Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Benjamin Trammell
- Christina Robinson
- Laura Kade

Abstract:

Abstract: Background: Childhood obesity is a growing global epidemic with significant racial, ethnic, and socioeconomic disparities. While current efforts to stem the tide of the obesity epidemic have focused on public policy and individual level behaviors, little research has been done on community and family-based health interventions. In this study, a novel design of personalized text messages allowed flexible participation while relaying key lifestyle information on six major contributing factors to obesity. The patient population served by the Pediatric Mobile Clinic has been known to be difficult to reach in part because of their diverse range of cultures and languages, lack of access to affordable healthcare, housing instability, phone service capabilities, and access to individualized health related information. The purpose of this sub-analysis was to identify the most efficient and effective recruitment methods to reach a broader subset of underserved patient populations. Methods: Literature review and research study personnel experience informed the design and implementation of 6 recruitment styles to help increase participant engagement. These styles included a tracking sheet, in-person discussions, phone call tree, text messages, email prompts and an Electronic Medical Record review, all of which led to a pre-screen questionnaire that determined eligibility for enrollment. Results: 377 potential patients were pre-screened resulting in 19 participants being enrolled into the study, which is a 5% enrollment rate. 39 of them were screened in person whereas the remaining 338 were screened via phone call tree. Telephone calls produced more people enrolled per month; however, telephone call recruitment required a greater volume of participants screened to produce one enrolled subject in comparison to in-person screening. In person recruitment was most effective overall with 11 of the enrolled having been recruited in person vs 8 enrolled via telephone calls. Phone calling results in greater volume but may not be as efficient. The largest prescreen failure group was due to the inability of being able to contact potential participants followed by English not being a patient's primary language. Conclusions: Enrolling people in-person may be beneficial because you are able to make a human connection which could result in a greater conversion of prospective patients to consented participants. Contacting patients multiple times via different forms of communication (Text message; email; voicemail) helped increase recruitment numbers. Recruiting patients via multiple and diverse methods may be beneficial for enrollment, particularly with underserved patients who live busy lives and may not be as accessible during clinic or traditional 9-5 hours. Future studies should consider expanding their recruitment base by applying for IRB approval of materials in multiple languages. The recruitment methodology and findings from this unique and underserved patient population could potentially inform and shape future community and family-based e-health studies.

Study of Cadaveric Posterior Circumflex Humeral Artery Variations

Abstract ID: UNTHSC158 Research Area: Structural Anatomy Presenter: Austin Fajkus Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

- Austin Fajkus
- Tien Do
- Jacob Cronk
- Cara Fisher

Abstract:

Purpose: There are concerns regarding the sequelae of blood clots post-vaccination due to suboptimal administration techniques with the ongoing incentive for vaccination against the Coronavirus Disease 2019 (COVID-19). Specifically, the risk of administering the intramuscular (IM) vaccine into an artery in the deltoid region. The posterior circumflex humeral artery (PCHA) is a small branch originating from the third part of the axillary artery, classically traveling with the axillary nerve, through the quadrangular space, to run along the inferior aspect of the deltoid muscle. This study investigates the presence and prevalence of variations of the PCHA not traversing in its classical path. Methods: Detailed dissection was performed on bilateral shoulders of 10 (n=20) human cadavers. The PCHA was identified in all 20 shoulders and their anatomic locations were assessed and categorized. Results: Of the 20 shoulders studied, 15% had anatomical variations of the posterior circumflex humeral artery traveling superiorly into the upper deltoid. Conclusions: Recent studies have highlighted the possibility of erroneous injection of the COVID-19 vaccine into the bloodstream as a risk of post-vaccination blood clots. The high prevalence of arterial variations revealed in this study provides an impetus for further research investigating the relationship between the variation in arterial anatomy and injection site "safe zones.â€□

Information, Motivation, and Behavioral Skills for Contraception Use among Women Experiencing Homelessness

Abstract ID: UNTHSC157

Research Area: Health Disparities Presenter: Ashvita Garg Submission Type: Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Ashvita Garg
- Annalynn Galvin
- Anelise Diener
- Stacey Griner
- Idara Akpan
- Erika Thompson

Abstract:

Purpose: Women experiencing homelessness have been reported to have higher rates of sexually transmitted infections, lower rates of contraceptive use, and higher rates of unintended pregnancies than stably housed women. Higher unintended pregnancy and lower contraceptive use in women experiencing homelessness warrant more research on behavioral cognitions for contraception access and utilization in this population. Assessing cognitions that affect contraception behaviors can be guided by utilizing a health behavior theory, such as the Information-Motivation-Behavioral (IMB) Skills model. Therefore, this study explored the IMB characteristics that play an important role in an individual's health behavior and could affect the contraception preferences among women experiencing homelessness. Methods: Semi-structured interviews (n=19) were conducted among women 18-45 years of age, not sterilized, English-speaking, and were currently experiencing homelessness. Women were recruited between December 2019 to March 2020 by convenience sampling through partnerships with local community organizations in Tarrant County. In-person or telephone interviews were conducted. Interviews were audio-recorded, transcribed, coded, and thematically analyzed based on the IMB framework. This study was approved by the North Texas Regional Institutional Review Board. Results: The mean age of women in the study sample was 33.4 years (SD = 7.6) and living situations included emergency shelters (37%), unsheltered locations (32%), transitional housing (26%), and rapid re-housing (5%). In the information construct, most women were aware of different contraceptive methods including intrauterine devices, implants, Depo shots, birth control pills, and condoms; however, many desired to learn more about the side effects of various methods. Additionally, some women had misconceptions regarding the possible side effects

of different contraceptive methods. For motivation, most women (n=16) had negative attitudes regarding becoming pregnant at that time. Various reasons for not desiring to become pregnant included age, new responsibilities, presence of other children, finances, health concerns, negative beliefs about abortion, or risks involved with having a baby while being homeless. Additionally, most women had a positive attitude towards their current method of contraception, but their motivation to use a type of contraceptive method depended on side effects and comfort with the method. When examining behavioral skills, benefits and barriers to accessing contraception were inquired. Several women mentioned the better health insurance coverage for birth control would benefit them. Lack of adequate insurance coverage and transportation were the major barriers. Other barriers included financial constraints, not enough knowledge regarding how to use birth control, and not enough information knowing how to get an appointment or start the process of getting birth control. Conclusions: Findings highlight the information, motivation, and behavioral skills for contraception use among women experiencing homelessness. Improving knowledge about side effects of various contraceptive methods, addressing any misconceptions, and increasing accessibility to contraceptive methods by providing transportation and financial assistance while maintaining reproductive autonomy might be effective strategies to improve contraception uptake and reduce unintended pregnancies among women experiencing homelessness.

Ultrasound Guided Cervical Plexus Block Cadaver Training

Abstract ID: UNTHSC155 Research Area: Other Presenter: Debini Banh Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Debini Banh
- Shanon Quach
- Lakiesha Crawford

Abstract:

Background Ultrasound guided techniques have become increasingly used in medicine to increase success rates and decrease complications of procedures such as central line placements, paracentesis, and regional nerve blocks. Ultrasound guided brachial plexus blocks are commonly used in surgeries and procedures involving the distal clavicle, shoulder, and proximal humerus. A majority of the training for nerve blocks were previously done on the job with live patients. There is limited research behind training on human cadavers. Ultrasound guided nerve block training on cadavers would enhance training for any medical education that involves such skill sets. Methods Fresh human cadavers were imaged using a Butterfly ultrasound on the nerve imaging preset. The brachial plexus was imaged in the transverse plane superior to the clavicle. The supraclavicular artery was used as the initial landmark. The probe was then moved superiorly until the anterior and middle scalenes came into view. A 25 gauge 1 inch needle was inserted in the transverse plane between the anterior and middle scalenes. Saline was then used to simulate local anesthetics and injected between the anterior and middle scalenes to simulate a brachial plexus nerve block. Results The images obtained from fresh human cadavers provided a more realistic image of the brachial plexus and surrounding structures such as the anterior and middle scalenes, the sternocleidomastoid, and the surrounding fascia compared to a phantom model of a nerve plexus. A fresh human cadaver was adequately able to simulate a nerve block in a live patient. Conclusion Cadaver ultrasound guided nerve block training would be an effective model to provide both medical students and interns to enhance their skills outside of the clinical setting. The realistic experience through cadavers would decrease the patient's procedural discomfort and increase confidence and the success rate of providing regional anesthesia including a brachial plexus block.

Not So Easy Sleeping: A Canary in The Coal Mine for Adolescent Asthma?

Abstract ID: UNTHSC154 Research Area: General Public Health Presenter: Laura Kade Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Laura Kade
- Erika Thompson

Abstract:

Purpose: Sleep is an important biologic process and deficits in sleep can lead to poor physical and mental health outcomes. Proper sleep is important for all ages; however, younger individuals need more sleep to maintain a healthy lifestyle. Currently, U.S. adolescents do not sleep enough, which is a concerning warning sign for negative downstream health effects. In adolescents, a lack of sleep has been linked to poor performance in school, drug and alcohol use, sports injuries, car crashes, and even suicide. A recent study has also found that adolescents who have disrupted sleep timing (i.e., going to bed late and waking up late) are more likely to have asthma and allergies â€" about three times higher $\hat{a} \in \hat{}$ than other adolescents who went to bed earlier. Asthma usually gets worse at night and poor sleep can lead to worse asthma symptoms, but the impact of sleep as a risk factor on the development of asthma is not well known. Given the increasing prevalence of asthma and poor sleep among adolescents, more research is needed in order to isolate appropriate interventions. The purpose of this study was to assess the proportion of high school students who were sleep deficient and if sleep was associated with the health outcome, asthma. Methods: The 2019 Youth Risk Behavior Surveillance System (YRBSS) was used to conduct an independent analysis of all Fort Worth high school student's (n=1,992) sleep and asthma status, stratified by demographic variables. A linear trend analysis from 2015 to 2019 of sleep and asthma, respectively, at the national and high school level was done using logistic regression models controlling for sex, race, and ethnicity. Additionally, a bivariate analysis was conducted using the YRBSS Analysis tool to assess for any associations between poor sleep and asthma. Results: A predominant portion of Fort Worth high school students do not get enough sleep (74.5%, CI [72.1, 76.8]), with 11th (76.9%, CI [72.6, 80.8], p value= 0.01) and 12th graders (82.4%, CI [78.1,86.0], p value=0.00) getting the least sleep in comparison with 9th graders (68.8%, CI [64.7,72.7]). While sleep has been on the decline (p value< 0.05) since 2015, asthma has been increasing (p value< 0.05) since 2015; however, individuals who identified as Hispanic were less likely to have asthma than individuals who identified as White (p value=0.01).

The bivariate analysis found that adolescents who get less sleep have a 1.62 times higher likelihood of having asthma (p value< 0.00). Conclusion: Poor sleep is a persistent and significant issue among adolescents that can lead to increased anxiety, depression, and difficulty concentrating in the short-term, and a higher risk for health issues later in life, such as excess weight gain, dyslipidemia, and metabolic and cardiovascular diseases. Sleep must be reprioritized to reduce the propensity for long-term consequences, with a particular focus on 11th and 12th graders. Further research is warranted in regard to the association between sleep status and asthma but better sleep will lead to improved adolescent and lifelong health outcomes.

Effect of Acute Heat Exposure on the Pressor Response to a Voluntary Hypoxic Apnea: A Cross-tolerance Study.

Abstract ID: UNTHSC153 Research Area: Cardiovascular Presenter: Benjamin Saul Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Benjamin Saul
- Holden Hemingway
- Rauchelle Richey
- Amy Moore
- Austin Shokraeifard
- Heidi Cope
- Albert Yurvati
- Rebecca Cunningham
- Michael Smith
- Steven Romero

Abstract:

The pressor response induced by a voluntary hypoxic apnea is exaggerated in individuals with obstructive sleep apnea and is strongly correlated to sympathetic overactivity. Acute heat exposure alters neural control of blood pressure, but its effect on the pressor response to a voluntary hypoxic apnea has never been explored. Therefore, we tested the hypothesis that acute heat exposure would attenuate the pressor response to a voluntary hypoxic apnea, and thereby manifest as a form of physiological cross-tolerance. Eight adults (3 females, 26 +/- 2 yrs) were subjected to passive heat stress (water perfused suit) sufficient to increase body core temperature by 1.2ËšC. Voluntary hypoxic apneas were performed in duplicate before acute heat exposure (pre-heat) and in recovery when body core temperature returned to a³‰× 0.3ËšC of baseline. Participants breathed gas mixtures varying FiO2 (21%, 16%, and 12%; randomized) for 1 min followed immediately by a 15 s end-expiratory apnea. Beat-by-beat arterial blood pressure (Finometer) and arterial oxygen saturation (finger pulse oximetry) were measured throughout. The pressor response was calculated as a difference between baseline mean arterial pressure and the peak response following each apnea. The change in arterial oxygen saturation during each apnea did not differ from pre-heat to recovery (FiO2 21%, pre-heat 0 +/- 1 % vs. recovery 0 +/- 2 %; FiO2 16%, pre-heat -4 +/- 1 % vs. recovery -4 +/- 2 %; FiO2 12%, pre-heat -8 +/- 3 % vs. recovery -10 + / - 4 %; P = 0.3 for interaction). The pressor response to a voluntary apnea was attenuated in recovery from acute heat exposure across all concentrations of

FiO2 (FiO2 21%, pre-heat 19 +/- 8 mmHg vs. recovery 16 +/- 8 mmHg; FiO2 16%, preheat 27 +/- 8 mmHg vs. recovery 20 +/- 8 mmHg; FiO2 12%, pre-heat 33 +/- 11 mmHg vs. recovery 27 +/- 13 mmHg; P = 0.02 for main effect of time). These data suggest that acute heat exposure induces a cross-tolerance effect such that the pressor response to a voluntary hypoxic apnea is reduced. Acute heat exposure could improve hypertension in adults with obstructive sleep apnea, secondary to altered chemoreflex function and sympathetic neural control, and provide additional therapeutic options for this population to improve cardiovascular health.

Retina-Targeted Estrogen Prodrug: A New Concept for Retinal Protection

Abstract ID: UNTHSC152 Research Area: Eye / Vision Presenter: Kevin Lal Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: GSBS Student

Author(s):

- Kevin Lal
- Yu Yu
- Jinmin Zhang
- Myhoa Tran
- Chimdindu Ezugwu
- KATALIN PROKAI
- Yang Liu
- Hongli Wu

Abstract:

Retinal injury due to excessive light exposure during military duties often results in serious vision damage to soldiers including irreversible loss of visual function. However, therapeutic interventions that can promote retinal protection or reverse retinal damage are very limited. This unmet clinical need also persists in the public when strong lasers, light, or fire cause trauma in ocular tissues. It is well known that estrogen has been shown to exhibit various beneficial actions in the central nervous system, including positively affecting mood and protecting the neuronal cells against neurodegenerative diseases. Despite estrogen's potential, its detrimental side effects prevent its clinical uses for neurotherapy. To overcome this challenge, we developed a bioprecursor prodrug, called 10Î²,17Î²-dihydroxyestra-1,4dien-3-one (DHED), that is selectively converted to E2 only in the neuronal cells, including retinal cells. To determine if treatment with DHED can sufficiently protect the photoreceptor from light-induced damage, male C57BL/6J mice were injected with or without 200µg/kg DHED (n=9) and 200 $\hat{A}\mu g/kg$ E2 (n=9) for 10 days before the light injury. Seven days after the light exposure, the visual function and retinal structure were examined by the spectraldomain optical coherence tomography (SD-OCT) and electroretinogram (ERG). After light exposure, we found massive photoreceptor loss as indicated by thinning of the outer nuclear layer (ONL) and retinal detachment. Additionally, DHED significantly prevented light-induced retinal structural changes and light-induced a- and b-wave reduction. The photoreceptor protective effects upon DHED treatment are stronger than that of E2, consistent with our earlier observation that targeted E2 delivery via DHED prodrug produces more robust neuroprotection than direct administration of E2. Our liquid chromatography-tandem mass
spectrometry (LC-MS/MS)-based bioassay indicated that DHED delivers the biologically active estrogen to the neuronal cells including the retinal cells without affecting other tissues - unlike the systemic exposure that is seen with estrogen. In conclusion, our study supported our hypothesis that DHED is an efficacious and safe site-specific delivery agent to produce robust estrogen-mediated retinal neuroprotection.

Encore The Impact of Quarantine on Pharmacy Students' Stress Level and Mental Health: A Regional Analysis

Abstract ID: UNTHSC151 Research Area: Education Presenter: Quang Nguyen Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Quang Nguyen
- Haley McKeefer
- Luis Garcia
- Katherine Muilenberg
- Annesha White
- Crystal Howell

Abstract:

Educators and student pharmacists adapted to online curriculum during the SARS-CoV-2 pandemic. The stress from COVID-19, quarantine, and virtual learning may impact student mental health. The magnitude of this stress may differ across the US due to some regions being affected more heavily by COVID-19 than others. We hypothesized there would be regional variation in pharmacy student stress before and during quarantine. During fall of 2020, US student pharmacists were invited to partake in an anonymous 40-question survey. The validated Perceived Stress Scale (PSS-10; Cohen, 1988) was incorporated to assess stress levels prior to and during quarantine. Additional demographic, quantitative, and qualitative free responses were captured, including CDC region. Blinded researchers (HB, QN) coded free response answers into common themes of stress while lead researcher (CH) adjudicated discrepancies. Descriptive and inferential statistics were analyzed using SPSS (Version 25.0, Armonk, NY). Analyses between PSS-10 and region prior to and during quarantine were made using Cochrane's Q test and Wilcoxon Signed-Rank and Friedman post hoc tests. 488 self-reported responses were received from 7 of 10 regions. Of these, 407 were eligible for analysis. All regions except region 9 showed an increase in PSS-10 scores during quarantine compared to before quarantine (6.2 Å \pm 12.5; p â‰× 0.001). Region 8 had the greatest magnitude (38.5%). 67% of subjects reported an increase in stress while 22% reported a decrease in stress, and 11% had no change in stress. 70 free responses were coded into five themes: mental compartmentalization (37%), learning environment (27%), technology academic isolation (14%), accessibility (13%), and personal isolation (9%). These results support our hypothesis that there is regional variation in student pharmacist stress before and during quarantine. Overall, these data suggest potential stressors of students that educators should consider in mental health outcomes.

Clinical significance of Annexin A2 expression in Bladder urothelial carcinoma.

Abstract ID: UNTHSC149 Research Area: Cancer Presenter: Christina Guo Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: TCOM DO Student (2nd Year)

Author(s):

- Christina Guo
- Panka J Chaudhary

Abstract:

Purpose: Bladder urothelial carcinoma (BLCA) is a highly malignant cancer, representing the 8th most common cause of cancer death in the US. The unpredictable disease course of BLCA necessitates an accurate biomarker to guide screening, prognosis, and treatment. Our objective was to investigate AnxA2 expression in tumor tissues of bladder urothelial carcinoma patients to determine AnxA2 association with bladder urothelial cancer and implicate AnxA2 as a potential prognostic marker. Methods: We utilized data from The Cancer Genome Atlas (TCGA) to observe AnxA2 gene expression in BLCA and its association with overall survival. Additionally, we quantified AnxA2 protein expression in tumor tissues of BLCA patients via immunohistochemistry. Results: In our analysis of TCGA data, AnxA2 mRNA expression was significantly higher in BLCA tumor tissues compared to normal bladder tissues. In addition, AnxA2 expression was significantly associated with higher tumor stage and grade as well as non-papillary tumor subtypes. The high expression of AnxA2 in BLCA patients was significantly correlated to decreased survival [hazard ratio (HR), 1.78; 95% confidence interval (CI), 1.3-2.44] as compared to low expression. In addition, we found that AnxA2 was significantly upregulated in tumor tissues of bladder urothelial carcinoma patients compared with adjacent non-cancerous bladder tissues. Conclusion: AnxA2 is overexpressed in BLCA patients, which is related to the advanced clinicopathological variables and adverse prognosis of patients with BLCA.

Optimizing Chronic Pain Management through Patient Engagement with Health-Related Quality-of-Life Measures: A Randomized Controlled Trial

Abstract ID: UNTHSC148 Research Area: General Medicine Presenter: Hanna McDonald, MS Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Hanna McDonald
- Mckenna Yablon
- Wayne Ngo
- Kimberly Garza
- John Licciardone

Abstract:

Purpose Chronic low back pain (CLBP) is a common health issue that requires accessible and cost-effective methods of management. Relevant guidelines in the United States emphasize the use of non-pharmacological and non-opioid treatments as first-line interventions. Additionally, health-related quality of life (HRQOL) has been proposed as an emerging measure of CLBP outcomes that may provide important information not captured by conventional measures such as pain intensity or physical function. Recent studies suggest that eHealth interventions to promote patient self-management may improve health outcomes in patients with chronic pain, including low back pain. The primary aim of this randomized controlled trial was to measure the efficacy of an eHealth intervention for HRQOL outcomes in patients with CLBP. Methods Trial participants were recruited from the PRECISION Pain Research Registry from November 2019 through February 2021. These participants met the NIH definition of CLBP, were between 21-79 years of age, and had HRQOL deficits involving sleep disturbance, pain interference, anxiety, depression, and low energy or fatigue (SPADE cluster derived from the Patient-Reported Outcomes Measurement Information System) as evidenced by a baseline score \hat{a} ‰¥55. A total of 331 participants were randomized to treatment or wait-list control groups. The treatment group received an eHealth intervention, which consisted of an individualized HRQOL report based on the SPADE cluster and subscale scores and an interpretation guide. Outcomes were assessed 3 months after randomization. The primary outcomes were changes in the SPADE cluster and subscale scores. Secondary outcomes included low back pain intensity measured with a numerical rating scale, and back-related disability measured with the Roland-Morris Disability Questionnaire. Changes over time for each outcome measure reported by participants in each group were compared using the Student's t test for statistical

significance and Cohen's d statistic for clinical importance. Positive change scores and dstatistics favored the eHealth intervention group. Results There were no significant differences between the eHealth intervention and wait-list control groups for changes over time in any primary or secondary outcome measure. The mean difference between groups in change scores on the SPADE cluster was 0.15 (95% CI, $\hat{a}'' \in 0.73$ to 1.03) (P=0.73). The d statistic for this difference was 0.04 (95% CI, $\hat{a}'' \in 0.18$ to 0.25). The corresponding d statistics for the SPADE subscales ranged from $\hat{a}'' \in 0.06$ (95% CI, $\hat{a}'' \in 0.27$ to 0.16) for anxiety to 0.11 (95% CI, $\hat{a}'' \in 0.10$ to 0.33) for sleep disturbance. Conclusions The eHealth intervention studied herein did not achieve statistically significant or clinically important improvements in any of the primary or secondary outcome measures. However, almost three-fourths of participants were enrolled after onset of the COVID-19 pandemic and may have had limited access to treatments for low back pain or to facilities or services needed to act on the information or recommendations derived from the HRQOL report. Thus, the validity and generalizability the findings may have been limited by the unforeseen onset and impact of the COVID-19 pandemic shortly after beginning the trial.

Efficacy of Interventional Procedures for Pain Control in Pediatric Patients with Central Sensitization of Pain

Abstract ID: UNTHSC147 Research Area: Pediatrics & Women's Health Presenter: Janice Han Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Janice Han
- Samita Charolia

Abstract:

Purpose: Adolescent chronic spinal pain is an increasing global issue with no standardized treatment and lack of treatment data. Though interventional procedures in adults have been shown to be effective, limited studies have been reproduced in the pediatric population. The goal of this study was to examine the efficacy and safety of using medial branch blocks (MBB) for the relief of chronic spinal pain in adolescents. Methods: MBB patient records from June 2012 to April 2021 were reviewed for the following variables: Age, pain and functional disability inventory (FDI) scores, change in functionality, and complications. For patients with multiple MBB, each MBB was analyzed separately. T-tests were used for inferential analyses. All study procedures were approved by the Cook Children's Medical Center Institutional Review Board. Results: Seventy patients had 93 MBB: 50 had 1 MBB, 17 had 2 MBB, and 3 had 3 MBB. The median (range) age was 16.19 (9.36-18.86) years. Only the first and second MBB are examined further. Median pain scores significantly decreased after both first (5 vs. 0, P < 0.001) and second (4.5 vs. 0, P < 0.001) interventions. Median FDI scores significantly decreased after the first (22.5 vs. 12.5, P< 0.001), but not after the second (20.5 vs. 19, P=0.30), intervention. Improvements in functionality were attained for 85% and 80% of patients after interventions 1 and 2, respectively. Only 6 (6%) MBB resulted in minimal complications and side effects. Conclusion: Results suggest that MBB are efficacious and safe for pain relief and overall functional improvement in the pediatric population.

NASAL NANO-VACCINE PREVENTS PRIMARY BREAST TUMOR FROM MAKING THE LUNG ITS NEW HOME

Abstract ID: UNTHSC146 Research Area: Immunology Presenter: Michael Donkor Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: GSBS Student

Author(s):

- Michael Donkor
- Harlan Jones

Abstract:

Despite medical advances in the diagnosis and treatment of cancer, metastatic breast cancers remain a leading cause of death in the U.S. Increasingly, novel immune-based treatments which harness the patient's immune system have promise for improving survivorship in metastatic breast cancer patients. Such therapies take advantage of the immune system's natural defense mechanisms to halt progression of breast cancer. This is mainly through the early activation of innate immune cells such as natural killer cells and the subsequent activation of the adaptive immune responses such as T and B lymphocytes which elicits a tumor-specific cytolytic and humoral antibody response, respectively. Researchers have taken advantage of these immune mechanisms of tumor defense as a complementary approach to current radio-chemo treatments, which have shown to be limited by adverse off-target effects on patients. This is particularly problematic for recurrent highly metastatic lung, brain, and bone disease, where the physiological function is a premium. Ongoing research in our laboratory is focused on using nanotechnology to develop immune-based vaccines to target local immune protection against metastatic lung disease. Because the lung is naturally tolerogenic, making it easy for disseminated tumor cells to grow, the expectation is that boosting immune responses at the lungs before seeding tumors from primary organs would mitigate metastasis and reduce mortality risks. Using an experimental murine breast cancer model of metastasis, we sought to examine the effect of intranasal vaccination to induce local and systemic adaptive immune responses as a first step in conceptualizing an immune-based nano-vaccine. We hypothesized that an intranasal vaccine protocol would induce protective lung mucosal immune protection against secondary lung metastasis. Our results demonstrated that intranasal vaccination provides protection against secondary lung metastasis using murine model of experimental lung metastasis. This protection was due to increased accumulation of both CD4+ and CD8+ T cells in the lungs that produced IFN-gamma as shown by flow cytometry and ELISA techniques. Again, our results show that intranasal vaccination produces higher tumorspecific IgG responses across respiratory tissues. These results provide initial findings

suggesting the potential for targeted tumor vaccines to produce a local tumor-specific T-cell and antibody response with the potential to prevent tumor metastasis. Future challenge studies using spontaneous model of lung metastasis will test our working hypothesis that intranasal tumor vaccination protects the lung from tumor development in the presence of a primary breast tumor.

Associations between drinking context and simultaneous marijuana use among underage drinkers

Abstract ID: UNTHSC144 Research Area: General Public Health Presenter: Nathanial Webb Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Cassidy Loparco
- Nathanial Webb
- Matthew Rossheim

Abstract:

Purpose: Drinking context (e.g., the source of alcohol, where alcohol was consumed, the number of people an individual drank with) is associated with quantity of alcohol consumed and the level of risk, particularly among underage drinkers. However, it is unclear how contextual factors may be associated with simultaneous use of marijuana while drinking. Simultaneous alcohol and marijuana use is associated with more negative consequences experienced compared to consuming either substance alone. This study extends previous literature by examining associations between contextual factors of underage drinkers' most recent drinking episode and whether they simultaneously used marijuana, using a nationally representative sample. Methods: National Survey of Drug Use and Health data from 2010 -2019 were used. The sample consisted of past-month drinkers under 21 years old (n =40,128 unweighted; N = 7,707,382 weighted for nationally representative estimates). Multivariable logistic regression models were used. Results: Compared to those getting alcohol from their parents, those who were given it for free (OR = 2.659, 95% CI = 2.312, 3.059), paid someone else to buy it (OR = 3.268, 95% CI = 2.762, 3.861), purchased it themselves from a store (OR = 4.284, 95% CI = 3.435, 5.349), or got it some other way (OR = 2.115, 95% CI = 1.822, 2.689) had higher odds of engaging in simultaneous alcohol and marijuana use. The number of people the participant drank with was not statistically significantly associated with simultaneous alcohol and marijuana use. Compared to those drinking in their own home, those who drank in a bar (OR = 0.664, 95% CI=0.495, 0.890) or in an $\hat{a} \in \hat{a}$ other' location (OR = 0.802, 95% CI=0.691, 0.931) had significantly lower odds of engaging in simultaneous alcohol and marijuana use, whereas those who drank in someone else's home (OR=1.373, 95% CI = 1.168, 1.614) or in more than one location (OR = 1.914, 95% CI = 1.458, 2.512) had significantly higher odds of simultaneously using marijuana. Conclusions: Given the associations between alcohol access and drinking locations with simultaneous alcohol and marijuana use, policy-level interventions should be considered. Specifically, enforcement of age verification laws in places where alcohol or

marijuana is purchased or consumed should be strengthened. This may be accomplished by increasing the frequency of compliance checks for age verification at these retail locations. Furthermore, limiting the alcohol and marijuana outlet density, particularly in areas with a high population of underage drinkers (e.g., near colleges), may decrease the prevalence of underage use. Increasing prices and taxation of alcohol and cannabis products may also decrease prevalence of use, particularly among young adults with limited income. Lastly, increasing enforcement of social host liability and sales to minors laws to hold adults providing substances to young people legally accountable may decrease sale to underage individuals. These strengthened legal and enforcement efforts may increase barriers related to purchasing or using alcohol and marijuana among those under 21.

The Unique Presentation of a Pediatric Patient with Gitelman's Syndrome (GS)

Abstract ID: UNTHSC143 Research Area: Pediatrics & Women's Health Presenter: Nicholas Leonard Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Nicholas Leonard
- Nusrath Habiba
- Robert Gillespie

Abstract:

Background: Gitelman's Syndrome (GS), also referred to as familial hypokalemiahypomagnesemia, is an autosomal recessive disorder that affects nearly 1 in 40,000 people worldwide. It is characterized in patients as hypokalemia, hypomagnesemia, hypercalciuria, and metabolic alkalosis. The disease results from 1 of nearly 140 different known mutations that can occur in the thiazide sensitive NaCl co-transporter located in the apical membrane of the distal convoluted tubule resulting in effects similar to thiazide diuretics. Most patients are diagnosed in adolescence and frequently present with complaints of tetany, facial paresthesia's, fatigue, and even delayed growth. Low potassium is especially concerning for the cardiovascular health of these patients. A potential complication is the development of ventricular arrhythmias, and even cardiac arrest, originating from prolonged potentials in cardiomyocytes that manifests as a wide QT interval on ECG. Case Presentation: This report outlines a unique presentation of an 8-year-old female with Gitelman's syndrome (GS). This patient experienced polyuria and polydipsia primarily at night as well as severe episodes of vomiting that her guardian later described as self-induced. Genetic testing for Gitelman's syndrome was eventually performed after labs indicated chronic hypokalemia. Interestingly, in contrast to the normal presentation of GS, labs for this patient showed elevated levels of magnesium instead of the usual hypomagnesemia seen in the majority GS patients. She was later found to have an abnormally prolonged QT interval likely resulting from her decreased potassium levels. Treatment for this patient's GS was potassium chloride to maintain potassium homeostasis. The patient of interest has experienced severe physical and sexually abusive relationships from a young age as well as family instability that eventually resulted in her placement into foster care. She was later placed on Guanfacine, Ritalin, and Zoloft for the treatment of her ADD/ADHD and depression symptoms. Conclusion: In this case report, we describe a pediatric patient and how her diagnosis of GS was made more complicated by abnormal lab values and her significant social circumstances.

Microstructure & Macrostructure Interrelationship in the Growing Hard Palate

Abstract ID: UNTHSC142 Research Area: Structural Anatomy Presenter: Courtney A. Miller Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Courtney Miller
- Ashley Steele
- Jason Organ
- Rachel Menegaz

Abstract:

Bone strength is the result of microstructure (bone material properties) and macrostructure (bone size and shape), and deficiencies in either can produce skeletal fragilities with an increased likelihood of injury. The micro- and macro-architecture work together during re/modeling, ensuring that the skeleton is resistant to repetitive loading and preventing fracture. Bone is particularly responsive to loading during the rapid growth occurring in early life. Within the craniofacial complex, the hard palate is a unique structure that undergoes continuous loading due to continuous resting/active tongue pressure and bite forces. Because of this, palatal growth is theorized to drive midfacial growth. The aim of this study is to investigate longitudinal changes in the palate when the relationship between microstructure and macrostructure is perturbed. Here we use the OIM mouse (B6C3FE a/a-Col1a2OIM/J), a strain with a mutation to the structural protein type I collagen, resulting in increased bone fragility and improper biomineralization. We hypothesize that OIM and unaffected wild-type (WT) mice will be most similar in bone micro- and macro-structure in regions of the palate that experience high loading and therefore high rates of bone modeling/remodeling. Mice were micro-CT scanned at two timepoints: week 4 (juvenile) and week 16 (adult). BMD was collected at 3 regions (anterior, mid, and posterior palate). Mann-Whitney U tests were used to compare BMD between genotypes. 28 fixed and 10 sliding landmarks were placed across the palate. Geometric morphologic analyses were conducted to determine variation between genotypes in overall shape and curvature throughout growth. Average BMD decreased along an anteroposterior gradient for all mice. While juvenile OIM mice had lower palate BMD than WT mice at all regions, adult OIM mice had significantly lower BMD at only the anterior and posterior regions but not the midpalate. Procrustes ANOVA revealed significant differences in palatal shape between the genotypes at both the juvenile (p=0.001) and adult (p=0.0015) stages. Principal component analyses revealed that juvenile OIM mice had a shorter anterior palate and broader palate compared

to WT mice, while adult OIM mice had a shorter posterior palate than WT mice. OI mice had flatter palatal arches in the coronal plane as juveniles, and in the midsagittal plane as juveniles and adults. Results show significant differences in palatal BMD and morphology between genotypes throughout growth, with fewer significant differences at the adult stage. Increased loading of the anterior palate during incisive gnawing may result in the convergence of bone macrostructure among adult mice, while increased strain at the midpalatal suture may necessitate increased BMD even in the presence of a biomineralization defect. Further research is needed to understand the functional significance of the anteroposterior palatal gradient and its relation to soft tissue attachments, particularly given the difference in oral behaviors between juveniles and adults.

Sex Specific Effects of Salt Loading on GABAA Responses in Oxytocin Neurons from the Supraoptic Nucleus

Abstract ID: UNTHSC141 Research Area: Neuroscience Presenter: Courtney Brock Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: Postdoctoral Fellow

Author(s):

- Courtney Brock
- Martha Bachelor
- Joel Little
- George Farmer
- Kirthikaa Balapattabi
- Joseph Cunningham

Abstract:

Arginine Vasopressin (AVP) and oxytocin (OXY) contribute to body fluid balance homeostasis. Salt loading (2% NaCl for 7 days) increases both AVP and OXY release in rats. The chronic increase in AVP release is associated with a change in the sensitivity of AVP neurons in the supraoptic nucleus (SON) to GABA so that GABAA receptor activation becomes excitatory. It is not clear if a similar mechanism is associated with chronic OXY release in this model. Our hypothesis is that changes in chloride homeostasis associated with salt loading occur in OXY neurons. To test this hypothesis, we used a chloride imaging approach with a ratio metric chloride sensitive dye, ClopHensorN (Addgene #50758) combine with an AAV with an oxytocin specific promoter (pFBOT563, Addgene # 40864). Adult, intact, Sprague Dawley rats of both sexes were anesthetized with isoflurane (2-3%) and were bilaterally injected with the AAV2-pFBOT--ClophensorN virus directly into the SON. Rats of both sexes were salt loaded by providing them with only 2% NaCl to drink for 7 days. Later, the animals were sacrificed and the brains were rapidly removed. The SON was dissected away from the brain and the cells were dissociated, plated on cover slips, and incubated for two hours. After incubation, recordings were taken using ratiometric live cell imaging on an inverted microscope. Selected neurons were sequentially excited at 445nm and 556nm and then emission data was collected between 500-550nm and 580-653nm respectively. After 40 cycles of 3-second recordings, muscimol (100nM), a GABAA receptor agonist was transiently applied to the cells and then allowed to wash off. Background fluorescence was subtracted. In cells from males, muscimol resulted in chloride influx in 70% OXY of the cells tested while chloride influx was observed in all OXY cells from females. The results suggest that salt loading may influence GABA responses of OXY neurons in males but not females.

Increasing Mental Health Literacy and Decreasing Stigma with the Lay Mental Health Advocates (LMHA) Program

Abstract ID: UNTHSC119 Research Area: General Public Health Presenter: Aiyana Ponce Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (1st Year)

Author(s):

- Aiyana Ponce
- Bruny Kenou

Abstract:

Purpose: Historically, mental health stigma, access to care, and discrimination all contribute to worsened health outcomes, especially for minority populations. To help address this, the Lay Mental Health Advocates (LMHA) program was created. This free, virtual training program is designed to teach laypersons the fundamentals needed to advocate for someone who is dealing with mental illness and their family members. LMHA focuses on teaching mental health advocacy by understanding how social determinants of health and racism play a key role in worsening mental health outcomes for marginalized communities. Workshops are led by psychiatry resident/attending physicians from Duke University Hospital and local community leaders. They include interactive role-playing advocacy practice, case study reviews, and other informative components. Those who complete at least 80% of the 8week course material receive a certificate of completion and are eligible to apply to become an advocate through the LMHA volunteer network. Methods: LMHA began as a volunteer project of the National Institutes of Health Academy Fellows, a program that gives trainee scientists the opportunity to implement a volunteer health program that addresses health disparities in their local community. The pilot LMHA program took place in Spring 2021. Pre and post program surveys were distributed to all active participants. The 2021 program had 100 participants (ages 18-58). 77 of these earned certificates of completion. The revamped 2022 program is on track to have double the number of participants from across the country. The curriculum was created by modeling the Johns Hopkin's Medicine Lay Health Advocate Program and the Mental Health Allyship Program. Needs assessment surveys were analyzed for the DC, Baltimore, and Durham regions to model the program on the community's needs. 3 sets of focus groups were conducted throughout the pilot program to further the curriculum and gain the participant's insight. Results: Comparing pre and post program survey data, there were increases in participant's: 1. Level of comfort using skills learned with LMHA to serve as an advocate for someone, 2. Understanding of how racism can impact a person's mental health and access to mental healthcare, 3. Understanding of how social determinants of health can affect someone's mental health and access to mental

health resources, and 4. Desire to become a mental health professional. Conclusions: There is a need for interventional programs to fill the mental health gap that is particularly prevalent among marginalized communities. Through LMHA, advocates can identify several different mental disorders, gain a greater understanding of the factors that exacerbate health disparities, understand how to provide effective emotional support, and gain confidence in the role they can play in affecting people in their community by being a mental health advocate.

Association of Pain Catastrophizing with Clinical Outcomes for Chronic Widespread Pain: A Retrospective Cohort Study

Abstract ID: UNTHSC117 Research Area: Psychology Presenter: Stephanie Vu Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Mira Ibrahim
- Tyler Thornton
- Joshua Baker
- Stephanie Vu
- John Licciardone

Abstract:

Purpose: Chronic widespread pain (CWP) is diffuse musculoskeletal pain lasting for 3 months or longer and is associated with numerous psychological symptoms, including fatigue, distress, difficulty concentrating, and depression. It affects over 20% of the population and may contribute to adverse health effects. Pain catastrophizing is defined an exaggerated negative mental set brought to bear during actual or anticipated painful experience. This study aimed to measure the association between pain catastrophizing and CWP, focusing on such clinically relevant outcomes as pain intensity, disability, and healthrelated quality-of-life (HRQOL) deficits. Methods: Study participants were selected from the PRECISION Pain Research Registry during the period from April 2016-December 2021. Eligible participants had chronic low back pain according to the National Institutes of Health case definition at registry enrollment and ranged from 21 to 79 years of age. Participants were classified as having CWP if they reported being "bothered a lotâ€□ by widespread pain or pain in most of their body in the 4 weeks prior to enrollment. Pain catastrophizing was measured at enrollment with the Pain Catastrophizing Scale and participants were classified as low, intermediate, or high pain catastrophizers based on tercile cutpoints. Multiple logistic regression was used to identify predictors of CWP at enrollment, and clinical outcomes were measured at quarterly encounters over 12 months. The primary outcomes included low back pain intensity measured with a numerical rating scale, back-related disability measured with the Roland-Morris Disability Questionnaire (RMDQ), and HRQOL measured with the SPADE cluster (sleep disturbance, pain interference with activities, anxiety, depression, and low energy/fatigue). Repeated measures analysis of variance was used to compare outcomes over 12 months according to pain catastrophizing level, including adjustment for potential confounders using propensity scores. Results: A total of 1,260 participants were studied.

There were 337 (26.7%) participants with CWP, of whom 212 (62.9%) had complete followup data. Pain catastrophizing was the strongest predictor of CWP (OR, 1.93, 95% CI, 1.39-2.68; P< 0.001 and OR, 3.22, 95% CI, 2.10-4.94; P< 0.001 for intermediate and high pain catastrophizers vs. low pain catastrophizers, respectively). A strong association was initially observed between pain catastrophizing and all longitudinal outcomes (P=0.004 for low back pain intensity, and P< 0.001 for back-related disability and HRQOL). However, only the findings for back-related disability and HRQOL remained significant following adjustment for confounders. The overall mean RMDQ scores were 16.0 (95% CI, 14.7-17.3), 16.6 (95% CI, 15.7-17.5), and 18.4 (95% CI, 17.7-19.1) (P< 0.001) for low, intermediate, and high pain catastrophizers, respectively. Similarly, the overall mean SPADE scores were 57.9 (95% CI, 56.3-59.6), 60.5 (95% CI, 59.4-61.6), and 63.2 (95% CI, 62.3-64.1) (P< 0.001) for low, intermediate, and high pain catastrophizers, respectively. Conclusions: This study demonstrates that pain catastrophizing strongly predicts long-term disability and HRQOL deficits in patients with CWP. There is a need for further investigation into psychological treatments aimed at reducing pain catastrophizing to mitigate its impact in this population.

School-based factors associated with attempted suicide among united states adolescents, 2015-2019

Abstract ID: UNTHSC116 Research Area: General Public Health Presenter: Caylee Forscher Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: TCOM DO Student (2nd Year)

Author(s):

- Caylee Forschner
- Robert Yockey
- Stacey Griner

Abstract:

Purpose: Suicide is the second leading cause of death among adolescents in the United States, ages 15 to 19 years old. Previous research has identified an extensive list of risk factors associated with adolescent suicide and indicates sexual minority youth, who identify as lesbian, gay, bisexual, or unsure, are at increased risk for suicidal behaviors, but limited research examines the contextual factors that may be associated with suicide attempts among these youth. Additional research is warranted into school-based factors and their relationship with suicide among sexual minority youth. The purpose of the present study is to investigate school-based factors associated with suicide and explore differences by sexual minority status among a large, nationally representative sample of U.S. youth over multiple years. Methods: Pooled data from the 2015-2019 Youth Risk Behavior Survey (YRBS) were analyzed. The YRBS is a bi-annual survey conducted in the United States to examine health behaviors among youth in middle and high school. Weighted logistic regression models were conducted to determine conditional associations to past-year suicide attempt ("yes or $no\hat{a} \in \Box$). The conditional associations considered were, sexual orientation ("heterosexual, gay/lesbian, bisexual and not sureâ $\in \Box$), did not go to school because they felt unsafe ("yes and noâ€□), and grades over the last year ("mostly A's/B's, mostly C's/D's/F's and none of these grades/not sureâ $\in \Box$). Interactions between sexual orientation and not going to school because they felt unsafe, were built and were mean centered to reduce multi-collinearity and interpretability of findings. Missing data were handled with multiple imputation methods and combined in multivariate analyses using Rubin's rules. The level of significance was set at p < .05 and were two-tailed. Analyses were conducted in Stata. Results: The total sample comprised of 44,066 students in 9th-12th grades, with nearly equal percentages of boys and girls (50.0% vs. 49.2%, respectively). An estimated 3.4% (95% confidence interval (CI): 3.15-3.62) of youth reported past year suicide attempt. Compared to heterosexual youth, bisexual youth (aOR: 1.38, 95%CI 1.24-1.53) were more likely to report attempting suicide. Students who reported feeling unsafe at school (aOR: 1.49, 95%CI 1.34-1.64) were

more likely to attempt suicide compared to those who reported feeling safe at school. Sexual orientations and feeling safe at school interactions were not significant- the students who did not feel safe were not those that identified as sexual minorities. Students who reported their grades as C's/D's/F's (aOR: 0.75, 95%CI 0.64-0.86) were less likely than students who reported A's/B's to attempt suicide. Conclusions: These findings indicate that students who do not feel safe in school have an increased risk of suicide attempts, underscoring the importance of programs that promote a safe and supportive school environment. Students who reported lower grades have a decreased risk of suicide attempts, necessitating further research to identify the influence of academic pressures. Understanding school-based factors affecting adolescent suicide risk is important to identify students at greatest risk and develop targeted and effective programs to reduce suicide in this age group.

Diaphragmatic breathing impacts on biophysiological systems

Abstract ID: UNTHSC113 Research Area: Other Presenter: Prince N Thomas Submission Type: Competition Poster Department: School of Health Professions: Physical Therapy Classification: School of Health Professions Student

Author(s):

• Prince Thomas

Abstract:

Anxiety and stress has been at an all-time high in recent years for various reasons. With added anxiety and stress comes a plethora of preventable diseases such as heart disease, asthma, diabetes, Alzheimer's disease, etc. The purpose of this study was to examine diaphragmatic breathing as an underutilized tool that may result in body relaxation and help with physical and mental health. Specifically, we are looking at the biophysiological changes that can be monitored, and how they are impacted by diaphragmatic breathing practices. This systematic review utilized PubMed and Scopus databases to identify 10 articles that met our inclusion criteria. Key words used were diaphragmatic breathing; mental health; real-time feedback; relaxation; sustained attention; DASS-21; HbA1c; diaphragmatic breathing; stress management; systematic relaxation; type 2 diabetes mellitus. The results displayed that Diaphragmatic breathing has an impact on multiple factors that correlate with overall health and well-being. We saw that diaphragmatic breathing interventions resulted in cortisol levels decreasing, Beck anxiety inventory scores decreasing, Dass-21 showing less depression, peripheral temperature decreasing, heart rate decreasing, blood pressure decreases, and decreased breathing rate. Studies have also shown better glycemic control for individuals with type 2 diabetes who participated in a diaphragmatic breathing protocol. The data that we looked at suggested that diaphragmatic breathing has positive implications for overall health and wellness. Stress management in the United States are often pharmacological interventions that can be costly and difficult for some to access. Diaphragmatic breathing is a free practice that has shown to provide positive results for individuals to improve their mental and physical health with minimal side effects.

Placenta Accreta in a 19-Year-Old Patient

Abstract ID: UNTHSC112 Research Area: Pediatrics & Women's Health Presenter: Brandon Mallory Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Brandon Mallory
- Crystal Cassimere
- Jacqueline Garda

Abstract:

Background: Placenta accreta is an obstetrical complication that occurs when the placenta abnormally implants into the uterine myometrium and is a leading cause of postpartum hemorrhage resulting in maternal and fetal morbidity and mortality. Early antenatal ultrasound diagnosis usually allows for the placenta accreta to be identified and managed by a multidisciplinary team. Without early identification, maternal mortality due to placenta accreta is as high as 7%. Case Presentation: A 19-year-old woman (G2P1011) at 40 weeks 5 days presented to the OB ED and was identified to be in labor. Patient had received prenatal care throughout the pregnancy and there were no identifiable risk factors for postpartum hemorrhage. She received an epidural and had a spontaneous vaginal delivery resulting in a viable male newborn. After repair of a second-degree vaginal laceration, she had persistent bleeding from higher up in the uterus. Patient was identified to have uterine atony and uterotonics were administered with no improvement to bleeding. Patient was transferred to the operating room, and after multiple conservative measures, including Bakri balloon and manual tamponade were unsuccessful, the decision was made to perform a partial hysterectomy. Good hemostasis was noted postop. Patient had an estimated blood loss of 4 liters during the procedure. She received 11 units of packed red blood cells, 2 units of platelets, 8 units of fresh frozen plasma, and 2 units of cryoprecipitate. Sections of the hysterectomy specimen were sent to pathology and showed findings consistent with focal placenta accreta. During the following hours in the ICU, her labs improved, and she remained stable. Since then, she has been discharged home and has not experienced complications outside the normal postpartum and post-hysterectomy complications. Conclusions: This case illustrates the potential complication of placental accreta including life threatening hemorrhage and need for blood transfusion postpartum. The rates of placenta previa and accreta have been increasing likely due to increasing rates of Cesarean delivery, maternal age, and assisted reproductive technology. Recognition of this condition prior to delivery using US is vital for successful management and prevention of pregnancy complications. Cesarean hysterectomy with placenta left in situ between 34 and 35 weeks of gestation is currently the gold standard surgical management of placenta accreta, so it is of particular note that this patient had a spontaneous vaginal delivery at 40w5d.

Multimorbidity and Whole Health among Adults in the United States: Evidence from the NHIS and BRFSS

Abstract ID: UNTHSC110 Research Area: Health Disparities Presenter: Mayela Warner Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Mayela Warner
- Rolake Neba
- Sydney Manning
- Constance Wiener
- Usha Sambamoorthi

Abstract:

PUPROSE Whole health is a patient-centered approach that promotes self-management of what matters to the patient. Whole health focuses on mind-body, recharge(sleep), healthy diet, emotional health, and movement, all of which are critical for those with multimorbidity. We examined the association of multimorbidity with good whole health among adults in the United States. METHODS We conducted a cross-sectional design. As no one dataset provided information on all components of whole health, we analyzed mind-body therapies, recharge, emotional health, and movement from the 2017 National Health Interview Survey (NHIS), and healthy diet from the 2017 Behavioral Risk Factor Surveillance System (BRFSS). Multimorbidity was defined as the co-occurrence of two or more chronic conditions. Recharge was measured by adequate duration of sleep and the Kessler Psychological Distress Scale (K6) was used to measure emotional health. All unadjusted and adjusted analyses were conducted using the SAS survey procedures. The samples from NHIS (N=25,134) and BRFSS (N=347,029) represented 213 million and 183 million adults, respectively. RESULTS Prevalence of the whole health components varied from 24.4% (mind-body therapies use), 55.7% (healthy-diet), 57.1% (movement), 63.9% (adequate sleep), and good emotional health (78.4%). Based on NHIS, only 3.4% reported good health in all four components. A lower percentage of adults with multimorbidity used mindbody therapies (22.9% vs 25.2%), had adequate sleep (58.2% vs 67.1%), good emotional health (71.8% vs 82.1%), adequate movement (16.2% vs 28.2%), and healthy diet (54.5% vs 56.5%) compared to those without multimorbidity (p < .001). Adjusted analyses revealed that those with multimorbidity were less likely to engage in whole health practices compared to those without multimorbidity. CONCLUSIONS Seven in 10 adults had poor health in two or more components of whole health. Adults with multimorbidity were found to have poorer health in all components of whole health. Nationally representative data

surveys should strive to collect information on all components of whole health with standardized measures.

How "in tune" are musicians to their musculoskeletal problems? A survey of dancers, instrumentalists, and vocal performers.

Abstract ID: UNTHSC107 Research Area: Physical Medicine / OMM Presenter: Patricia Colucci Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (4th Year)

Author(s):

- Patricia Colucci
- Yein Lee
- Katrina Roop
- Cynthia Passmore

Abstract:

RAD Abstract Submission How "in tune" are musicians to their musculoskeletal problems? A survey of dancers, instrumentalists, and vocal performers. Purpose This is an ongoing survey of dancers, instrumentalists, and vocal performers connected with University of North Texas Health Science Center Performing Arts Medicine Clinic (UNTHSC PAMC.) The study's goal was to study the injuries, illnesses, prior treatments, self-care habits, and the effectiveness of osteopathic manipulative treatment (OMT) when addressing the musculoskeletal injuries of the performers. Methods A survey consisting of 33 quantitative and qualitative questions was created using Qualtrics and granted IRB approval (IRB 1504435-3.) The survey gathered information about the duration and frequency of practices and performances for dancers, vocal performers, brass, string, percussion, and woodwind instrumentalists. Surveys were distributed and collected through the internet and a mobile platform. Information regarding the survey was disseminated through social media and word of mouth. Data was gathered from Qualtrics and analyzed. Performers were asked specifics of their practice schedule, if break time is allotted, and about performer injuries and treatments pursued. If a participant received OMT, he or she was asked about its impact on their return to performance. Those surveyed also reported the amount of cardiovascular exercise and resistance and flexibility training they do in a week. Every person surveyed was asked about the impact coronavirus disease 2019 (COVID-19) has made on their performance. Results At this time, of 58 respondents, and 42 instrumentalists were selected for initial analysis. These instrumentalists are primarily White, highly educated, 30 years of age, and have typically played 13 years (range 5 $\hat{a} \in 66$ years). Preliminary results revealed that 75% of instrumentalists report practicing 5 hours or more per week. Additionally, 66% of instrumentalists play with pain, most reportedly in the jaw, anterior neck, and upper/middle back. The instrumentalist demonstrated a high level of

technical language when describing their injuries. The survey reported frequent break times and using a variety of at-home modalities to treat their pain, while 78% reported less than four hours of cardiovascular activity per week. There were eight subjects who responded to questions regarding OMT. Of those responses, three responded that OMT has decreased or improved pain, four responded that OMT had reduced time away from performances, and three reported OMT had enhanced sound quality. Conclusions The current findings support the already known high prevalence of musculoskeletal injuries amongst instrumentalists. Many musicians were significantly aware of their medical problems, as evidenced by the highly technical description of their various musculoskeletal diagnoses. While they demonstrated trying many different self-care and treatment modalities for their injuries and illnesses, the survey shows musicians dedicate little time to physical activity. Due to a lack of responses, the significance of OMT on musculoskeletal injuries of the performers remains to be seen.

A Case Series of Atypical Back Pain in Pediatric Athletes

Abstract ID: UNTHSC105 Research Area: Pediatrics & Women's Health Presenter: Arsalan Ali Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Arsalan Ali
- Benjamin Jacobs
- Artee Gandhi
- Meredith Brooks

Abstract:

Background: Baastrup's disease is a rare, often misdiagnosed, cause of back pain in children. It is characterized by degenerative changes of both spinous processes and interspinous soft tissues between two adjacent vertebrae. Repetitive spinal movements in the sagittal plane predispose to injury of the posterior elements of the spine. Chronic flexion and extension strain the interspinous ligament causing the neighboring spinous processes to adjoin. Pain is aggravated by extension and palpation and is alleviated with flexion. Some children with Baastrup's do not experience pain but present with swelling along the spinous processes. Moreover, increased interspinous spaces and bone remodeling may also be seen. Diagnosis is dependent on distinctive radiologic findings and characteristic exam features. This is the first report of children undergoing interventional modalities for the treatment of Baastrup's disease. Case Information: The first case study is a 16-year-old active gymnast who initially presented to the clinic in 2014 with complaints of a sore back that worsened with extension and arching. On physical exam, there were trigger points along her thoracic spinous processes. Diagnostic imaging revealed early suspicion for spinous process abnormality at the thoracolumbar junction region vertebra, particularly T12. A conservative treatment approach was initially taken however her symptoms did not resolve. The patient ultimately underwent bilateral T11, T12, L1 medial branch blocks. The second case is an 18year-old female cheerleader and gymnast who initially presented to the clinic in 2016 complaining of one year duration of back pain that started after doing tumbling exercises in gymnastics. After multiple visits and imaging modalities, a working diagnosis of Baastrup's disease was suspected. The patient was treated with four trigger point injections in her interspinous ligament that were done at different times. Conclusion: While the current treatment for pain associated with Baastrup's is directed towards physical therapy, massage therapy, nonsteroidal anti-inflammatory medications, muscle relaxants and rest from activity, this is the first report of children undergoing interventional modalities for the treatment of back pain associated with Baastrup's disease. The epidemiology of the disease

is very rare in the pediatric population, however, certain active groups such as gymnasts can be at an increased risk due to repeated spinal extension and flexion movements.

Phenotype of Pacing-Induced Heart Failure in Lean and Obese Ossabaw Swine

Abstract ID: UNTHSC104 Research Area: Cardiovascular Presenter: Caleb Reagor Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Caleb Reagor
- Jonathan Sweeney
- Matthew Biggerstaff
- Johnathan Tune

Abstract:

Caleb Reagor, Jonathan Sweeney, Matthew Biggerstaff, and Johnathan D. Tune Authors contributed equally Purpose: There are numerous preclinical models of heart failure in large animals; however, almost all reflect heart failure with reduced ejection fraction (HFrEF). There are currently no suitable large animal models of heart failure with preserved ejection fraction (HFpEF). The lack of HFpEF models represents a significant gap in translational studies to understand pathophysiological mechanisms and elucidate potential treatments for approximately 50% of all heart failure cases. Obesity and its related comorbidities are more strongly associated with risk of future HFpEF versus HFrEF. We hypothesized that obese animals would develop HFpEF in response to 4 weeks of tachypacing, whereas lean animals would develop HFrEF in response to the same stimulus. Methods: Three groups of Ossabaw swine were studied, including lean swine without pacing (n = 9; control), lean swine with pacing (n = 5), and obese swine with pacing (n = 5). Ossabaw swine are an ideal model for these studies, as they demonstrate a human-like response to a high calorie, high fat diet (e.g., obesity, insulin resistance, and dyslipidemia). Swine were anesthetized and pacemakers were implanted to drive the right ventricle at 180 beats/min. After recovery and 4 weeks of pacing, animals were anesthetized, and a pressure-volume catheter was inserted into the left ventricle to assess the type and degree of heart failure. Results: Paced animals had grossly enlarged heart chambers and significant abdominal ascites. Tachypacing increased heart weight (176 Å \pm 11, 229 Å \pm 13, and 234 Å \pm 14 g in control, lean, and obese swine, respectively; p < 0.01). Ejection fraction was not different between groups (58 Å \pm 6, 53 Å \pm 6, and 59 Å \pm 6% in control, lean, and obese swine, respectively; p = 0.86). Tachypacing increased left ventricular end diastolic pressure (LVEDP), a hallmark of heart failure (12 Å \pm 1, 28 Å \pm 4, and 26 Å \pm 1 mmHg in control, lean, and obese swine, respectively; p < 0.001). Conclusions: The data indicate that we have created a tachypacing-induced model of HFpEF in Ossabaw swine. However, in direct contrast to our

prediction, tachypacing produced HFpEF in both lean and obese Ossabaw swine. Tachypacing significantly elevated filling pressure (LVEDP) to pathophysiological levels, but ventricular performance (ejection fraction) was maintained. Our findings support the idea that Ossabaw swine subjected to tachypacing represent a clinically relevant large animal model of HFpEF.

Innate immune system stimulation during pregnancy induces upregulation of thromboxane synthesis in rat maternal heart

Abstract ID: UNTHSC103 Research Area: Cardiovascular Presenter: Selina Tucker Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Selina Tucker
- Spencer Cushen
- Jessica Bradshaw
- Jennifer Gardner
- Contessa Ricci
- Gregory Dick
- Johnathan Tune
- Styliani Goulopoulou

Abstract:

Purpose: Infections during pregnancy are associated with adverse clinical outcomes. We previously showed that exposure to immunostimulatory ODN2395 (synthetic Toll-like receptor 9 agonist) during pregnancy induces maternal vascular inflammation and enhances vascular tone in pregnant rats. These outcomes were mediated in part by activation of the cyclooxygenase/thromboxane A2 (COX/TxA2) pathway. The objective of this study was to investigate the impact of ODN2395-induced immune system stimulation on maternal hearts during pregnancy. We hypothesize that exposure to TLR9-mediated immune system activation during pregnancy upregulates the COX/TxA2 signaling pathway in maternal cardiac tissues in rats. Methods: Rats were treated with a synthetic CpG DNA (ODN2395, 1 mg/kg, intraperitoneal injection) or vehicle (saline) in late pregnancy. Fetoplacental biometrics were recorded after euthanasia on gestational day 20 and maternal hearts were collected to assess COX-1 and COX-2 expression and 6-keto PGF1 $\hat{1}$ ± (PGI2 metabolic byproduct) and TxB2 (TxA2 metabolic byproduct) production. Results: Left ventricular tissues from dams treated with ODN2395 released higher concentrations of TxB2 compared to tissues from vehicle-treated dams (ODN2395: 0.56 \hat{A} ± 0.06 ng/mg protein vs. Vehicle: 0.31 \hat{A} ± 0.04 ng/mg protein, nï, 35, p=0.0041) but there were no differences in cardiac 6keto PGF1 \hat{I} + release between groups (p=0.16). COX-2 expression was lower in left ventricles from ODN2395-treated rats compared to vehicle-treated rats (p=0.009). There were no differences in cardiac COX-1 expression between groups (p=0.27). Exposure to ODN2395 during pregnancy increased fetal-placental weight ratio (ODN2395: 5.3 Å± 0.22

vs. Vehicle: 4.7 Å \pm 0.15, p = 0.04). COX-2 expression was greater in placental tissues from ODN2395-treated rats (p=0.004) but there were no differences in placental 6-keto PGF1Î \pm (p=0.51) and TxB2 release (p=0.32). Conclusion: TLR9 activation during pregnancy induces upregulation of TxB2 synthesis in maternal cardiac tissues coupled with a reduction in COX-2 expression. Maternal heart may have enhanced sensitivity to bacterial infections during pregnancy.

A Rare Case of Multiple Sclerosis in a Pediatric Patient

Abstract ID: UNTHSC102 Research Area: Pediatrics & Women's Health Presenter: Rukaiya Akhtar Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Rukaiya Akhtar
- Priya Bui
- Joanna Garcia

Abstract:

Background: Multiple sclerosis (MS) is an immune-mediated, inflammatory disease primarily affecting the central nervous system (CNS). It is characterized by demyelination and axonal loss, and results from a combination of environmental and genetic factors. While rare, MS can develop in pediatric patients. Diagnosis of MS in pediatric patients can be very difficult as signs and symptoms appear differently in individuals and because it can mimic other diseases, such as acute disseminated encephalomyelitis (ADEM). Case Presentation: The patient is a 5-year-old female who began experiencing symptoms around 3 years old. In March 2020, she presented to the ER with unsteady gait, abnormal behavior, and decreased appetite. Upon completing a lumbar puncture and getting a brain MRI, she was initially diagnosed with ADEM. In the coming months, she was admitted to the ER two more times â€" once in May and again in June 2020. Each time she presented with different neurological symptoms. During her admission in June, brain imaging taken confirmed lesions consistent with MS and she was diagnosed with MS. Conclusion: Both ADEM and MS are inflammatory disorders of CNS characterized by demyelination. Distinguishing between the two diseases can be challenging as initial signs and symptoms, as well as imaging can look very similar. However, knowing key differences can help in establishing a proper diagnosis. Current treatment strategies include high dose corticosteroids for acute attacks, and disease modifying therapies for long-term treatment. Understanding how MS differs from similar diseases and how pediatric MS varies from adult MS is critical for proper diagnosis and treatment. Furthermore, while there is increasing recognition of pediatric MS, there is a need for more research and literature in this field to raise awareness and better diagnose, treat, and manage this disease.

Designing a Sustainable in-Clinic Protocol to Expand Postural Stability Data Collection

Abstract ID: UNTHSC100 Research Area: Physical Medicine / OMM Presenter: Mai Dinh Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Mai Dinh
- Shawn Kennedy
- Sanya Gupta
- Rajesh Nayak
- David Mason
- Yein Lee
- Rita Patterson

Abstract:

Purpose: Assessing postural stability may help to predict fall risk and aid in understanding underlying mechanisms of injuries due to falls. Several studies have compared postural stability in different populations of patients; however, the age, gender, race, health conditions, and the number of participants were limited. To answer clinical questions on the relationship between postural stability and fall risk, it is necessary to expand the dataset by including minority and vulnerable populations. The objective of this study is to design a sustainable clinic research data collection protocol to better understand fall risk in the diverse minority populations surrounding the HSC community and provide clinicians with sway information on their patients. Methods: Sustainable data collection protocol: Thirdyear medical students rotating in OMM clinic collected sway data for one half day during their month-long rotation. Data collectors were presented a video demo of the protocol and a didactic video on balance and falls before collecting data. Medical assistants in the clinic brought patients to students before the appointment time or when the patient's physician was seeing another patient, to avoid delays in clinic schedule. The total time for data collection is approximately two minutes. Postural sway data: Postural sway was evaluated in patients seen in the Osteopathic Manipulated Medicine (OMM) clinic at the University of North Texas Health Science Center between 6/7/2021 and 12/21/2021. Patients who were cane or wheelchair-dependent and children less than 65 lbs. were excluded. Patients took off their shoes and put on shoe covers. Patients then stood on footprints attached to the Bertec Force Plate (Bertec Columbus, Ohio). Patients were asked to stand straight, hands by their sides, body facing toward and looking at a target in front of them for 10 seconds with their eyes open. The same procedure was repeated with their eyes closed. Three trials of

each condition were performed. A rest period of three seconds took place between each trial. Measurements of Mean Center of Gravity Sway Velocity were collected. Postural sway data was retrospectively analyzed from the clinic data collection (UNTHSC IRB# 2013-102). Results: 701 postural sway measurements were collected on a total of 511 patients between 06/07/2021 and 12/21/2021. Conclusion: As a result of creating a sustainable data collecting model by incorporating third-year medical students in their rotations as data collectors, 701 postural sway measurements were obtained in approximately seven months. This achievement was possible due to the continuous improvement of the protocol with the collaboration of clinic staff and physicians to ensure data collection incorporates smoothly into the natural flow of the clinic. Future steps: One next step is to allow treatment providers secure access to their patient's data so they can discuss changes in sway during clinic visits. Another is to partner with artificial intelligence experts to form algorithms to analyze the data on diverse patient populations to assist clinicians in clinical assessments/treatments and possibly provide fall prediction alerts.
Efficacy of Gastrostomy-Button for Weight Gain in Patients with Hypoplastic Left Heart Syndrome

Abstract ID: UNTHSC98 Research Area: Pediatrics & Women's Health Presenter: Ojaswi Ghimire Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Ojaswi Ghimire
- Tyler Hamby
- Lane Lanier

Abstract:

Purpose & Background: Hypoplastic left heart syndrome (HLHS) is a congenital heart defect (CHD) in which the left side of the heart is underdeveloped. HLHS makes up 2-3% of all CHD; 25-40% of neonatal cardiac death is due to untreated HLHS. One of the biggest challenges in palliative care of HLHS is weight gain and gastrostomy-button (GB) may be beneficial. To evaluate GB insertion during Norwood admission on increase in body mass index (BMI), height, and weight between Norwood discharge to Glenn discharge. Design/Methods: A retrospective cohort study of patients with HLHS at Cook Children's Medical Center (CCMC) between 2007 and 2021 was performed. Patients were excluded for not undergoing Norwood procedure; remaining inpatient between Norwood and Glenn procedures; having GB inserted after Norwood discharge; or not completing Glenn procedure at CCMC. Gender and GB status were recorded. Age, height, and weight were recorded for at Norwood surgery, GB Insertion, Norwood discharge, Glenn surgery and Glenn discharge. World Health Organization growth charts were used to compute age- and gender-adjusted z-scores for BMI, height, and weight. Change in growth variables were then compared between patients with and without GB using a two-tailed independent sample t-tests. Results: Of 146 patients meeting inclusion criteria, 56 patients were excluded: 3 did not undergo Norwood procedure; 21 remained inpatients between Norwood and Glenn procedures; 2 had G-Button inserted after Norwood discharge; and 30 did not complete Glenn procedure at CCMC. Of the remaining 90 patients, 31 (34%) had GB. Patients with GB gained significantly more (p=0.011) weight than patients without GB from Norwood discharge to Glenn discharge. There were no significant differences in height or BMI changes during that period (see Figure 1). Conclusion: Patients after Norwood procedure undergoing GB placement demonstrate greater weight gain than those without GB placement. The present research should be replicated using a larger sample.

Comparative Analysis of Same-Day Surgery Cancellations for Total Joint Arthroplasty Patients at JPS between 2018 and 2019

Abstract ID: UNTHSC97 Research Area: Other Presenter: Cody Lyons Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (2nd Year)

Author(s):

- Cody Lyons
- Russell Wagner

Abstract:

Background Same-day surgery cancellations create an enormous financial burden by wasting hospital resources such as healthcare professional labor hours, operating room time, and underutilizing surgical equipment. The aim of this study was to follow-up a previous study investigating reasons for same-day surgery cancellations, and to determine if there has been a decrease in same-day surgery cancellations in 2019 compared to 2018 after the implementation of an optimization clinic. Methods This is an incidence study comparing knee and hip replacement surgical candidates between two years. We will review the reasons for cancellations during 2018 and compare those with our data collected for 2019 knee and hip replacement same-day surgery cancellations. Results We are awaiting data collection and analysis for same-day surgery cancellations in 2019, but the top three reasons for cancellation in 2018 included the discovery or development of a new medical condition and/or contraindication to surgery, abnormal pre-operative test results, and the lack of beds being available. An optimization clinic for all preoperative arthroplasty patients was instituted after collection of the 2018 data. The data collected should reveal if the optimization clinic has led to a decrease in same-day surgery cancellations, and therefore, hospital losses. Conclusions In the 2018 data collection, two areas were identified as having potential for immediate improvement, availability of hospital beds and problems with surgical equipment, implant, or supply. Based on 2018 findings, implementation of strategies to eliminate these issues could decrease the yearly cancellation rate by an additional 30%. With new information on 2019 cancellations, we will not only compare 2018 vs. 2019, but we could follow the data longitudinally to see where JPS could potentially save hundreds of thousands of dollars in the future.

Differential associations between AV-45 brain amyloid and blood biomarkers by consensus diagnosis among adults with Down Syndrome

Abstract ID: UNTHSC96 Research Area: Aging / Alzheimer Presenter: Leah Goehring Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Leah Goehring
- Melissa Petersen

Abstract:

Authors: Leah Goehring, Melissa Petersen, Michael Phelan, Lisa Taylor, Anne Fagan, Rachel Henson, Beau Ances, Nicole Schupf, Michael Yassa, Sharon Krinsky-McHale, Mark Mapstone, Florence Lai, H. Diana Rosas, Margaret Pulsifer, Christie Hom, Wayne Silverman, Ira Lott & David Keator Introduction: Individuals with Down Syndrome (DS) are at an increased risk for developing dementia, specifically Alzheimer's Disease (AD) due to triplication of Chromosome 21 leading to the overproduction of the beta amyloid. Few studies to date have examined the link between plasma biomarkers of AD pathology and brain amyloid in adults with DS who also have dementia. The aim of this study is to examine the relationship between specific plasma biomarkers (neurofilament light chain [NfL], total tau) and amyloid deposition in the brain among adults with DS. Methods: Data were analyzed on n=66 adults with DS (n=41 cognitively stable [CS]; n=16 mild cognitive impairment [MCI-DS]; n=9dementia [DEM]) enrolled in the Alzheimer's Disease in Down Syndrome (ADDS) Study. Plasma concentrations of NfL and total tau were analyzed using Single Molecule Array (Simoa) technology.18F-AV-45 PET and T1-weighted MRI scans were collected to examine amyloid deposition in the brain. MRI-derived voxel-weighted SUVR averages were derived for each region of interest (ROI). A priori selected brain regions included the anterior/posterior cingulate, superior/inferior/middle temporal, superior frontal, inferior parietal, lateral occipital, orbitofrontal, lateral/medial orbitofrontal, and rostral middle frontal lobes. Fixed effect linear models were conducted with each diagnostic group to examine the association between the predictor variables (plasma biomarkers) with each of the a prior-identified ROIs, adjusting for linear effects of the covariates (age, ApoEe4, site, sex and brain volume). Results: Among those with DS who were determined to be CS, elevations in NfL were significantly associated with increased amyloid uptake in the superior temporal lobe, anterior cingulate, superior frontal lobe, inferior parietal lobe, inferior temporal lobe, orbitofrontal lobe, middle temporal lobe, lateral orbitofrontal lobe, medial orbitofrontal lobe and rostral middle frontal lobe. The latter ROI was also found to be

significantly related to increased NfL levels among those with MCI-DS. No significant associations were found between NfL and amyloid deposition among any of the ROI examined for those with DEM. When examining the link between total tau and amyloid, the only finding was for those with a diagnosis of DEM, with a decrease in total tau found to be significantly associated with increased amyloid in the superior temporal lobe. Total tau was otherwise not found to be significantly related to amyloid deposition in any of the ROI for those with a diagnosis of CS or MCI. Discussion: Plasma biomarkers remain an appealing tool as they are less expensive and invasive as compared to other neuro-diagnostic modalities. Our study suggests that plasma biomarkers may be useful in tracking amyloid deposition in specific regions of the brain for adults with DS and highlight the potential utility for their application.

Unilateral Renal Hypoplasia

Abstract ID: UNTHSC95 Research Area: Structural Anatomy Presenter: Matthew Wieters Submission Type: Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Matthew Wieters
- Kylie Tran
- Zane Smith
- Hibaa Thayyil
- Landan Weber
- Cara Fisher

Abstract:

Background: Unilateral renal hypoplasia can occur as a result of, or in conjunction with, comorbidities such as hypertension, vascular diseases, pyelonephritis, and congenital developmental disorders. Contralateral renal compensation with hypertrophy of the sister kidney is one of the common sequelae of unilateral renal hypoplasia in addition to chronic renal failure (CRF) due to dysfunctional filtration and impaired blood pressure regulation. The incidence of renal hypoplasia according to epidemiological studies is 1 in 400 births. This case report examines the potential causes of a hypoplastic kidney found in the retroperitoneum of an 80-year-old female cadaver. Case Information: Detailed dissection of the left retroperitoneal space of the subject revealed a morphologically hypoplastic kidney with dimensions of 40 mm in length, 21 mm in width, and 13.5 mm in thickness. Hemisection of the kidney revealed cortical thinning as well. Contralateral compensation by the right kidney led to hypertrophic dimensions of 112 mm in length, 64 mm wide, and 46 mm in thickness. Average kidney pole-to-pole length is around 102 mm for the left kidney and 99 mm for the right kidney in women aged 80-89 years. Blood supply to the hypoplastic kidney appeared normal initially, however, upon measurement, the left renal artery was found to be much narrower at 1.72 mm in width in comparison to a typical renal artery diameter of 5 mm. The left renal vein exiting the hypoplastic kidney measured 57 mm in length compared to an average left renal vein length of 60-100 mm. The ureter exiting the left hypoplastic kidney was 1 mm wide while the right ureter measured 3.75 mm in width. No clear pathological characteristics were visualized in the kidney, such as cysts or tissue dysplasia. An additional finding of this case was an abdominal aortic aneurysm (AAA) measuring 140.5 mm from the inferior base at the common iliac artery bifurcation up to the superior border where the superior mesenteric artery branches. The AAA measured 40 mm wide and 27.75 mm in thickness. Conclusions: The compensatory enlarged right kidney and

altered dimensions of the artery and vein associated with the hypoplastic kidney indicate potential for abnormal vasculature affecting overall kidney growth and function. The thin cortex also indicates reduced nephrotic function. Renal hypoplasia and impaired renal function predispose an individual to conditions such as hypertension or chronic renal failure. If patients present with a hypoplastic kidney, physicians can monitor potential chronic conditions and provide proper intervention. Likewise, physicians should be aware that patients with chronic cardiovascular and renal conditions are at a greater risk of developing an atrophic kidney if left untreated. Although a definitive etiology is unable to be determined due to a lack of sufficient past medical history, investigation into the relationships of anatomical variants adds to the current literature and understanding of this condition.

Contraception use, perceived susceptibility to pregnancy, and pregnancy desire among women experiencing homelessness.

Abstract ID: UNTHSC93 Research Area: Health Disparities Presenter: Annalynn M. Galvin Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Annalynn Galvin
- Ashvita Garg
- Stacey Griner
- Anelise Diener
- Idara Akpan
- Erika Thompson

Abstract:

Purpose: Women experiencing homelessness are at higher risk of unintended pregnancy. While contraception may reduce unintended pregnancy rates, women experiencing homelessness have low rates of effective contraception use. In addition to access and affordability, how women perceive their susceptibility to pregnancy on contraception may also explain disparate rates of contraception use. This qualitative study aimed to explore how women experiencing homelessness perceive their susceptibility to pregnancy with and without contraception. Methods: From December 2019 - March 2020, semi-structured interviews (n=19) were conducted among pregnancy-capable (i.e., not sterilized), Englishspeaking women experiencing homelessness in Fort Worth, TX, 18-45 years of age, as part of a larger system-wide study investigating contraception preferences for women experiencing homelessness. Participants were recruited through flyers at local shelters, active recruitment through case managers, community partnerships, and snowball sampling. Interview questions included hypothetical perceived susceptibility to pregnancy while on and off contraception, pregnancy attitudes, and actual contraception use. Interviews were audio-recorded, transcribed, and analyzed using a seven-step framework method for coding and theme identification. This study was approved by the North Texas Regional Institutional Review Board. Results: Women had a mean age of 33.4 years (SD=7.6 years), with reported race almost evenly split between Black (47%) and White (53%). Primary nighttime residence included emergency shelter (n=7), unsheltered locations (n=6), transitional housing (n=5), and rapid-rehousing (n=1). All but two women reported inconsistent or no contraception use. Most women were confident in general contraceptive efficacy and perceived low pregnancy susceptibility when using hypothetical

contraception. Some women found their risk of pregnancy was equal with and without contraception based on perceptions of specific contraception efficacy (e.g., condoms versus pills); fertility and fecundity concerns; and high abstinence self-efficacy. When asked whether they would like to get pregnant in the next year, 47% said no (n=9), 21% said yes (n=4), and 32% said they did not know (n=6). All four participants who wanted to become pregnant in the next year did not report current contraception use at the time of the study. Most women who were unsure or not wanting pregnancy in the next year were also not using consistent contraception. Women who desired pregnancy in the next year or were uncertain of whether they wanted to get pregnant in the next year reported similar perceived susceptibility to pregnancy regardless of contraception use, compared to women not desiring pregnancy in the next year who had a higher perceived susceptibility to pregnancy without contraception and lower perceived susceptibility with contraception. Conclusions: Findings elucidate why some women experiencing homelessness may perceive similar pregnancy susceptibility with both contraception use and non-use. Given the need to have higher susceptibility to pregnancy without contraception use for consistent contraception uptake, findings may better explain lack of actual contraception use, preferences for contraception, and pregnancy desire. Understanding the interplay between perceived susceptibility to pregnancy, housing status, and pregnancy perceptions such as timing-based pregnancy intention can better promote contraception and pregnancy prevention for women experiencing homelessness who do not desire pregnancy.

A Comparison of Certain Pediatric Vaccination Rates in Fort Worth, TX Due to the COVID-19 Pandemic

Abstract ID: UNTHSC92 Research Area: Pediatrics & Women's Health Presenter: Naser Asfoor Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Naser Asfoor
- Shane Fernando
- Ashlyn Fairchild

Abstract:

Purpose: The COVID-19 pandemic is a prime example of how a disease can fundamentally affect daily living on a global scale. Vaccines are one of the most important preventive methods healthcare providers use to combat disease. This study compares certain pediatric vaccination rates from before and after the COVID-19 pandemic in an outpatient clinic. Methods: Data was obtained from the Electronic Health Record of patients at the University of North Texas Health Science Center (UNTHSC) Pediatrics and Women's Health Clinic in Fort Worth for a three-year period from 2019-2021. ICD-10 codes for immunization were used for analysis of data. Frequencies of vaccination were assessed in patients seen on or after March 18, 2020 and patients seen on or before March 17, 2020 as these dates correspond with the transition of patient interaction from in-person to virtual clinic visits. Bivariate analysis using t-test was used to assess for change in immunization rates for Hepatitis A, Diphtheria, and Influenza vaccines. Results: Among 9520 patients, 51.3% were White, 22.2% were Black or African American. 35.7% were Hispanic or Latino. Mean age was 8.03ű5.75, while 49% of subjects were female. The vaccine counts Pre-Pandemic (March 2019 to October 2019) and Post-Pandemic (March 2020 to October 2020) were compared. Results were statistically non-significant in Hepatitis A, t = -0.71, p = 0.504; Diphtheria, t = 2.3, p = 0.054; and Influenza, t = 0.87, p = 0.413. Conclusion: Results from this study suggest that vaccinations for Hepatitis A, Diphtheria, and Influenza were not statistically significant when comparing pre-pandemic versus post-pandemic vaccination counts. This could also be due to a quick re-opening after initial lockdown measures and increased administration of vaccines to compensate for delayed immunizations from clinic closures. By increasing use and training of telehealth, clinics can adjust to future pandemic measures more efficiently and prevent a lull in pediatric immunizations.

Barriers to Diabetes Management in the Homeless Population

Abstract ID: UNTHSC91 Research Area: Health Disparities Presenter: Nathalie Scherer Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Nathalie Scherer
- Glen Smith
- Kari Teigen
- David Capper

Abstract:

There are few studies assessing outcomes for homeless patients with diagnosed diabetes, despite evidence that homeless patients suffer from diabetes at about the same rate as the general public, which as of 2018 is approximately 10.5% of the U.S. population. Diabetes is a chronic disease that usually does not present with acute symptoms until late into the course of disease progression. Due to social vulnerability, homeless patients often present a particular set of challenges that require different approaches from healthcare providers. These challenges include unstable housing, limited food choices, behavioral health problems, lack of access to stable care and transportation, and chronic stress. These challenges build barriers that prevent homeless patients from managing their chronic diseases effectively. There are very few studies looking at which particular barriers are the most challenging for patients, so we believe a survey quantifying the barriers will be useful for the field of diabetes management and for chronic disease management in the homeless population as a whole. We expect that by identifying specific barriers we could impact both better patient outcomes and lower healthcare costs for unhoused patients by targeting the specific issues that they struggle with. In our study, we will be operating out of the True Worth Clinic, which is a JPS clinic that primarily serves homeless patients. There is a robust diabetes education team that works to provide care to homeless patients with diabetes mellitus. Our aim is to work with the diabetes education team to create and implement a survey that will be administered to patients coming into the clinic over the next 6 months. The survey will focus on barriers to care that are unique for homeless patients managing chronic conditions, such as diabetes. Having data on patient's barriers to care will allow the True Worth Clinic to more effectively address the unique barriers that their patients face.

Neurocranial Growth in the OIM Mouse Model of Osteogenesis Imperfecta

Abstract ID: UNTHSC88 Research Area: Structural Anatomy Presenter: Tooba Husain Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Tooba Husain
- Courtney Miller
- Ashley Steele
- Lauren Gonzales
- Emma Handler
- Jason Organ
- Rachel Menegaz

Abstract:

Osteogenesis imperfecta (OI) is a disorder of type I collagen characterized by abnormal bone formation and weakened bone architecture. Human patients with OI have larger cranial vaults (macrocephaly), altered cranial base morphology including basilar invagination and platybasia (skull base flattening), and midfacial underdevelopment. The neurocranial changes may affect both underlying nervous tissue and growth patterns of the facial skeleton. However, we still do not fully understand how and when these divergent morphologies occur. The aims of this study are: (1) to investigate the integrated development of the skull and the brain in amouse model of OI; and (2) to identify the developmental trajectories of these structures to facilitate future therapeutic interventions. We hypothesize that compared to unaffected mice, mice with OI will have decreased brain volumes due to an overall reduction in cranial size and decreased cranial base angles (CBA) due to platybasia. To test these hypotheses, we used the osteogenesis imperfecta murine (OIM or B6C3FE a/a-Col1a2/J), a model for the severe type III OI in humans, and unaffected wild-type (WT) littermates. Mice were imaged using in vivo micro-computed tomography (micro-CT) at the juvenile (week 4; 10 OIM/14 WT) and adult (week 16; 90IM/11 WT) stages. All measurements were taken in 3D Slicer software. 82 cranial landmarks were used to calculate centroid size, an estimate of overall head size. The segmentations tool was used to create virtual endocasts as a proxy for brain volume. The angle tool was used to measure CBA in the midsagittal plane using threelandmarks: foramen cecum, midsphenoidal synchondrosis, and basion. Mann-Whitney U tests were used to compare centroid sizes, brain volumes, and CBA between the genotypes. Both juvenile (p=0.008) and adult (p=0.003) OIM mice were found to have absolutely smaller brains than WT mice. However, OIM mice also have significantly smaller cranial centroid sizes compared to WT mice (p=0.003, p<0.001). When scaled to cranial size, juvenile mice had relatively larger brain volumes (p=0.016) butadult OIM relative brain volumes were not significantly different from WT. No significant difference was seen in CBA at the juvenile (p=0.065) or adult (p=0.171) stages, however a trend was observed for decreased CBA at the adult stage. These results suggest that neurocranial dysmorphologies in OI may be more severe at earlier stages of postnatal development. Previous analyses of these mice have documented relative skeletal macrocephaly in both juvenile and adults, however here we document an increase in relative endocranial volume only at the juvenile stage. A reduction in CBA during growth, possibly due to platybasia, may underlie this decoupling between external and internal cranial morphology. Future work will investigate the effect of CBA on facial growth and midfacial underdevelopment in these mice. A better understanding of the integration and growth trajectory of the neurocranium is foundational for formulating treatments to manage basicranial instabilities in patients with OI. Support or Funding Information Funding was provided by an Indiana University Collaborative Research Grant, Ralph W. and Grace Showalter Trust, and a UNTHSC Physiology & Anatomy SEED Grant.

Characterization of Estrogen Receptors (ERs) and ERmetabolizing enzymes in Lipedema and Non-Lipedema Adipose Stem Cells (ASCs) and differentiated adipocytes

Abstract ID: UNTHSC87 Research Area: Cell & Molecular Biology Presenter: Samantha Walczak Submission Type: Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: TCOM DO Student (2nd Year)

Author(s):

- Samantha Walczak
- Sara Al-Ghadban
- Caroline Rinderle
- Bruce Bunnell

Abstract:

Introduction: Lipedema is a chronic, idiopathic painful disease characterized by an excess of adipose tissue in the lower extremities, commonly misdiagnosed as obesity, lymphedema, or chronic venous insufficiency. As the severity of lipedema worsens patients have reduced mobility, easy bruising, and fatigue and it is thought to resist lifestyle modifications. While treatments such as liposuction can help ease these symptoms, it is not curative, and the underlying etiology is unknown. Hypothesis: As the development of lipedema often begins or worsens during periods of hormonal change such as puberty, pregnancy, or menopause, we hypothesize that alterations in estrogen drive lipedema pathogenesis. Aim: The aim of this study is to characterize the gene expression of estrogen receptors (ER- \hat{I} ± and ER- \hat{I} ²), G-protein coupled estrogen receptor (GPER), and ER metabolizing enzymes: Hydroxysteroid 17-beta dehydrogenase (HSD17B1, B7, B12), Hormone-sensitive Lipase (LIPE) and Steroid Sulfatase (STS) in ASCs and differentiated adipocytes in BMI and age-matched nonlipedema and lipedema patients. Methods: Cell culture and Oil Red O stain, RNA extraction and RT-PCR assays were used to assess the expression of ERs and the estrogen metabolizing enzymes in ASCs and differentiated adipocytes. Results: $ER-\hat{I}\pm$, $ER-\hat{I}^2$, and GPER gene expression were increased in Lipedema ASCs cultured in hormone-depleted media, as well as in differentiated adipocytes compared to non-lipedema corresponding cells. LIPE, STS, HSD17B17, and HSD17B12 gene expression were also increased in Lipedema differentiated adipocytes compared to non-lipedema differentiated adipocytes. In addition, the gene expression of HSD17B1 was increased in Lipedema ASCs cultured in hormone-depleted media compared to non-lipedema ASCs. Conclusion: These results indicate that expression of ERs and estrogen metabolizing enzymes are altered by Lipedema and suggest that estrogen may play a role in adipose tissue dysregulation in lipedema.

Exploring this possible etiology further could contribute to the expansion of treatment options and management available to lipedema patients.

Prenatal Screening for Sexually Transmitted Infections: Guideline Information Sources

Abstract ID: UNTHSC86 Research Area: Pediatrics & Women's Health Presenter: Ashlyn Kinard Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: TCOM DO Student (2nd Year)

Author(s):

- Ashlyn Kinard
- Kaeli Johnson
- Stacey Griner

Abstract:

Purpose: Sexually transmitted infections (STIs) during pregnancy can have adverse outcomes for women and neonates, including birth defects, preterm labor, and stillbirth. National guidelines from professional organizations, such as the American College of Obstetricians and Gynecologists, exist and provide detailed recommendations for STI screening among pregnant patients to help prevent negative health outcomes. These recommendations evolve with developing research, and little is understood about the dissemination of updated guidelines to prenatal providers. The purpose of this study was to assess provider awareness of screening guidelines and the source of guideline knowledge. Methods: Prenatal providers (MD/DO; n=201) were recruited by a survey panel to complete an online survey. Data was collected regarding guideline awareness (Does your professional organization have recommendations or guidelines about STI screening during pregnancy? Yes/no/don't know) and the most common sources used by providers to learn about recommendations and guidelines for STI screening in pregnancy. Twelve sources were listed, including conferences, professional organizations, continuing education, journal articles, practice bulletins, and residency programs. Providers then indicated the preferred sources for the dissemination of updated guidelines. Prenatal care provider demographic information, including degree and practice setting, was collected. Univariate analyses and frequencies were calculated in SPSS. Results: Out of the prenatal providers surveyed, 96% were a Doctor of Medicine (MD) and 65% worked in a private practice setting. Overall, 88% of prenatal providers were aware of STI screening guidelines during pregnancy. Of those aware, the primary sources used to learn about these guidelines included practice bulletins (20%), professional organizations (18%), continuing education (14%), and residency programs (14%). Of those unaware (12%), the sources they would use to learn about these guidelines included practice bulletins (28%), continuing education (22%), and professional organizations (15%). All respondents indicated practice bulletins (27%), professional organizations (23%), continuing education (14%), and journal articles (10%) as sources

they would like used to be notified of changes in STI screening guidelines. Conclusion/Implications: Overall, practice bulletins, professional organizations, and continuing education were the preferred sources to obtain information regarding prenatal STI screening guidelines as well as future updates to those guidelines. Similar sources were selected by both providers that were aware and those that were unaware of screening guidelines to where they do gain or would like to gain their information, respectively. This indicates a complex issue with the dissemination of prenatal STI screening guidelines, suggesting that this information reaches some prenatal providers but not all. In regard to notifying providers of changes in guidelines, journal articles emerged as an indicated source, suggesting a possible new strategy for sharing screening recommendations. Future studies should analyze the dissemination of prenatal STI screening guidelines and any subsequent changes to help improve provider awareness and increase the rate of screening.

A Monoallelic DNM1L Mutation presenting with Epilepsia Partialis Continua: A Case Report

Abstract ID: UNTHSC85 Research Area: Neuroscience Presenter: Andrew (Chanhyun) Park Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

• Chanhyun Park

Abstract:

Background: Variants in DNM1L are reported as a rare cause of refractory epilepsy and status epilepticus. We report a patient with epilepsia partialis continua (EPC) secondary to a monoallelic DNM1L mutation. Case Information: An 11-year-old boy with prior history of speech delay and well-controlled absence epilepsy on valproate presented in clinic with status epilepticus and posterior frontal diffusion restriction on MRI. Seizures were characterized by hemifacial clonus consistent with EPC. Extensive workup including EEG, MRI, cytokine, and encephalitis panels were unrevealing for etiology. Genetic peroxisomal panel revealed a monoallelic missense mutation (R403C) in the DNM1L locus as cause for his EPC. GDF15 was also elevated, reaffirming the presence of mitochondrial disease. This DNM1L mutation was determined to be the underlying etiology for his presentation. Lacosamide, clobazam and phenobarbital, among other interventions, were ultimately used to control the patient's epilepsy; he was sent home after extensive stays in the PICU and inpatient rehabilitation unit. Conclusions: DNM1L mutations can cause cerebral dysmyelinations, abnormal gyral patterns, microcephaly, and death within the first year of life. Yet several recent cases, including ours, have linked DNM1L variants with other neurological phenotypes, including a late onset of symptoms such as intractable epilepsy, myoclonus, and developmental delay. This case is strikingly like that of a previous report but with additional clinical features such as aphasia and EPC. The presentation of EPC in our patient, as well as the difficulty finding its etiology, exemplifies the unclear clinical pattern that remains with DNM1L mutations. The clinical ambiguity of this mutation complicates diagnosis and demonstrates the importance of prompt genetic testing.

E-cigarette Use Trend and Pattern among Texas High School Students: Considering the Inverse Relationship with Cigarette Smoking

Abstract ID: UNTHSC83

Research Area: General Public Health Presenter: Joseph Odeyemi Submission Type: Competition Poster

Department: School of Public Health: Health Behavior & Health Systems **Classification:** School of Public Health Student

Author(s):

- Joseph Odeyemi
- Erika Thompson

Abstract:

Purpose: Over the last decade, e-cigarettes have grown in popularity, surpassing cigarettes as the most widely used tobacco product among adolescents in the United States. Current evidence suggests that using e-cigarettes (vaping) may be less harmful than smoking cigarettes; however, while the long-term effects of vaping are still being studied, it has been linked to chronic lung and cardiovascular diseases and an increased likelihood of transitioning to cigarettes. Despite the association between smoking and vaping, the upward trend of vaping among young people is infrequently studied in concert with the prevalence of cigarette smoking. The objectives of this study are to explore the prevalence of e-cigarette use and socio-demographic factors that influence this behavior, and to examine the trend of e-cigarette use and potential associations with cigarette smoking among Texas high school students. Methods: This study analyzed and presented data on the prevalence of current and frequent use of e-cigarette products and cigarette smoking among high school students from the 2019 Texas Youth Risk Behavior Survey (YRBS), a biennial cross-sectional survey with a sample size of 2032. Previous Texas YRBS data were referenced to report relevant trends. Analysis was conducted using the YRBS online interactive data tool which utilized SAS (version 9.4) and SUDAAN (version 11.0.1). The pairwise t-test and Wald chi-square tests were used to determine significant differences and associations between estimates. Results: Nearly one in five respondents (18.7%) reported e-cigarette use during the 30 days before the survey and a quarter of e-cigarette users reported vaping almost every day. Non-Hispanic White students were significantly more likely to report current use of e-cigarettes than Hispanic and non-Hispanic Black adolescents (P< 0.001). Students who identified as bisexual were also more likely to report vaping than students who identified as heterosexual (P=0.03). The likelihood of reporting electronic vapor product use also appeared to increase with high school grades. Overall, the prevalence of cigarette smoking appeared to be on the decline from a reported 17.4% in 2011 to 4.9% in 2019. On the contrary, e-cigarette use has been on the increase, achieving

a peak prevalence of 18.7% in 2019. Conclusions: Current public health anti-tobacco strategies appear to be effective in reducing cigarette smoking but not vaping among adolescents. The popularity of e-cigarettes among high school students has increased steadily over the last 10 years; however, a remarkable decline was observed between 2015 and 2017. It is important to further investigate the causes of this reported decline as this may inform future public health strategies. Halting the upward trend of e-cigarette use is a priority as these products put adolescents at risk of significant morbidity.

Types of Telehealth services preferred by geriatric patients during the COVID-19 pandemic

Abstract ID: UNTHSC82 Research Area: Aging / Alzheimer Presenter: Matthew Nguyen Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (2nd Year)

Author(s):

- Matthew Nguyen
- Krystal Cruz Escobar
- Janice Knebl
- Tyson Garfield

Abstract:

Technologies' growing involvement in health care has led to continuous improvement in access, efficiency and quality of care, but specific challenges lie with addressing the barriers that impair the geriatric population from benefitting the use of new technology.1 The purpose of this quality improvement initiative was to obtain feedback from older adults and their caregivers regarding the usage of telehealth services during routine clinic care and their preferences for each type of visit. A convenience sample survey was administered to 55 geriatric patients older than 50 years old between June â€" October 2021 who have their medical at the University of North Texas Health Science Center â€" Center of Older Adults' ambulatory clinic. The survey included questions about the patients' demographics, the survey taker's relationship to the patient if not the patient, and their experiences with telehealth services. Additionally, the survey included questions using a Likert scale where the patient or caregiver ranked types of clinical visits they would prefer telehealth services for versus an in person clinic visit. Responses from the participants were compared based on the types of visits. Of the 55 respondents to the survey questionnaire, 37 were females and 18 were males and 45 were the older adult patients, 9 were family member caregivers and 1 non-family caregiver. The results indicated that the majority of patients and caregivers preferred the following types of visits as a telehealth visit: reviewing prescriptions, review of laboratory results, blood pressure management, and questions/screening about COVID-19. All other types of clinic visits, such as routine clinic visits for chronic conditions, acute illness symptoms, acute or chronic pain conditions, psychosocial needs and advanced care planning were preferred to be done in person. When asking about their experiences with telehealth services, geriatric patients used the telephone the most often for their medical needs. These findings indicate that geriatric patients prefer to continue traditional in person clinic visits for their acute and chronic disease management but are open to having discussions about their laboratory values,

blood pressure management, reviewing medications and Covid-19 screening through telehealth. The high telephone telehealth usage suggests that the majority of geriatric patients are not comfortable and familiar with other forms of telehealth that includes the use of virtual platforms that has developed over recent years. Although telehealth cannot be used as a means to replace in person visits, it has been shown to have a place in clinical care for geriatric patients and their caregivers depending on the clinical needs.

ASPARAGINASE ASSOCIATED INTRA-CARDIAC THROMBUS PRESENTING AS SEPSIS IN AN ADOLESCENT PATIENT DURING ALL INDUCTION THERAPY

Abstract ID: UNTHSC80 Research Area: Cancer Presenter: Kylie Wu Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Shefali Rai
- Kylie Wu
- Tyler Hamby
- Ashraf Mohamed

Abstract:

Background: The incidence of pegaspargase induced thrombotic complications in pediatric patients with acute lymphoblastic leukemia (ALL) is 5.2%, with the majority of thromboses induced by asparaginase occurring in the venous system. Drug-induced intracardiac thrombosis is very rare and, if noted, usually develops within the right atrium in relation to central lines. Case Presentation: A 14-year-old female was diagnosed with B-cell ALL. At the time of diagnosis, her echocardiogram revealed a mild congenital dysplastic mitral valve with underdevelopment of the posterior leaflet, but cardiac function was not affected. The patient was started on a 4-drug induction and received 2 doses of pegaspargase. She was readmitted to the hospital on induction day 25 with diffuse body aches, generalized weakness, mildly elevated lipase, hyperbilirubinemia, pancytopenia, and severe hypoalbuminemia (1.6 gm/dl). Her direct bilirubin measured 1.7 mg/dL and amylase measured 289 U/L. On induction day 38, the patient developed a fever of 39.2°C. She became very ill looking and pale, but was oriented and alert. She stated that breathing was harder than earlier that morning. A chest x-ray was ordered to assess increasing O2 requirement and bilateral opacities were found at the base of the lungs. Her heart rate was 130 bpm and blood pressure was 100/77 mmHg. After being transferred to intensive care, a stat echocardiogram was ordered due to suspected sepsis-induced cardiogenic shock. However, upon examination, the echocardiogram demonstrated an echo bright mass along the lateral wall of the left ventricle (LV), consistent with an LVT. The thrombus extended to the mitral valve causing severe acute mitral regurgitation leading to cardiogenic shock requiring pressors and inotropic support. The patient was initially started on heparin infusion to treat the LVT due to contraindications for surgical intervention including thrombocytopenia, neutropenia, and active cytomegalovirus infection. She later underwent LV thrombectomy and mitral valvuloplasty. She improved significantly after surgery and was transferred to the rehabilitation unit. Conclusion: This patient demonstrated a unique presentation to pegaspargase associated thrombus formation. Given the rareness of cardiogenic shock secondary to intra-cardiac thrombosis during pediatric ALL therapy, the clinical picture can be mistaken with septic shock. Having a high index of suspicion may prompt early evaluation with echocardiogram, which can make an immense difference in the management and outcome of a patient.

Changes in the Expression of SMARCA4 in a Rat Model of Ocular Hypertension

Abstract ID: UNTHSC79 Research Area: Eye / Vision Presenter: Josh Worley Submission Type: Competition Poster Department: North Texas Eye Research Institute Classification: TCOM DO Student (2nd Year)

Author(s):

- Joshua Worley
- Dorota Stankowska
- Bindu Kodati
- Raghu Krishnamoorthy

Abstract:

Title: Changes in the Expression of SMARCA4 in a Rat Model of Ocular Hypertension Purpose: SMARC4 (BRG1) is an ATP-dependent chromatin remodeling protein belonging to the SWI/SNF family of proteins involved in regulation of gene expression in numerous cell types in the body. The purpose of this study was to determine changes in the expression of SMARCA4 in the retina following intraocular pressure (IOP) elevation by the Morrison model in Brown Norway rats. We hypothesize that SMARCA4 expression may modulate the expression of the key genes involved in the neurodegenerative changes seen secondary to IOP elevation. Methods: The Morrison model of ocular hypertension (by injection of hypertonic saline through the episcleral veins) was utilized to unilaterally elevate the IOP in Brown Norway rats. IOP was elevated in the left eye of three retired breeder Brown Norway rats, with the right eye serving as the corresponding contralateral control. Rats were maintained for 2 weeks following IOP elevation and IOP measurements were carried out twice per week. Rats were subsequently euthanized, and retinal sections were obtained from both IOP-elevated and contralateral control eyes. Immunohistochemical analysis of SMARCA4 expression was carried out by immunostaining. Following confocal microscopy imaging, the intensity of immunofluorescence was quantified with the ImageJ software (NIH), and compared between IOP elevated and control eyes. Results: Immunohistochemical analysis revealed an appreciable decrease in the expression of SMARCA4 in retinal sections in two out of three rats, mainly the nerve fiber layer (by 47 to 57%), ganglion cell layer (by 18 to 40%) and inner plexiform layer (by 9 to 19%) in IOP elevated rat eyes compared to control eyes. One out of three tested rats showed a modest

increase in immunostaining for SMARCA4 in the nerve fiber layer, ganglion cell layer and inner plexiform layer. Ongoing experiments will replicate these findings in order to generate statistically significant data. Conclusion: Changes in SMARCA4 expression could serve to regulate the expression of gene contributing to neurodegenerative effects due to elevated IOP. Understanding the role of SMARCA4 may allow us to better understand and address the mechanisms involved in glaucomatous neurodegeneration.

Additive Effects of Diabetes and Lower-Limb Amputation on Osteoarthritis with Comparison to Diabetic and Healthy Controls

Abstract ID: UNTHSC78 Research Area: Structural Anatomy Presenter: Wayne Ngo Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: TCOM DO Student (2nd Year)

Author(s):

- Wayne Ngo
- Cait Finnerty
- Malaka Finco
- Bethany Holley
- Rachel Menegaz

Abstract:

Purpose: Individuals with type II diabetes and individuals with lower-limb amputation each have increased risks of developing osteoarthritis compared to the general population. Despite the high co-occurrence of type II diabetes with lower-limb amputations, the additive effects of these conditions are unclear. In order to better manage the risk of developing osteoarthritis in these populations, a better understanding of how diabetes and amputation might compound osteoarthritis risk is needed. Methods: We measured hip and knee joint space, as indicators of osteoarthritis, in four groups of individuals: 1) lower-limb amputees with diabetes, 2) lower-limb amputees without diabetes 3) diabetic controls, and 4) healthy controls. We hypothesized lower-limb amputees with diabetes would have the most impaired musculoskeletal health, followed by amputees without diabetes, diabetic controls, then healthy controls. 30 total CT scans of males (42-79 years; BMI 19.7 - 48.9 kg/m2) were obtained from the New Mexico Decedent Image Database. 10 scans were identified for amputees, diabetic controls, and healthy controls. Half of the lower-limb amputees had diabetes while half did not, to differentiate effects of diabetes and amputation on musculoskeletal health. 3D Slicer software was used to measure hip and knee joint spaces as indicators of osteoarthritis. Comparisons between groups were assessed using Kruskal-Wallis with Dunn's post hoc tests. Results: Amputees with and without diabetes showed significantly narrower hip (p=0.01) and knee (p=0.08) joint space bilaterally compared to diabetic and healthy controls. This result suggests amputees could be at a higher risk of developing lower-limb osteoarthritis compared to diabetic and healthy individuals, which is in line with prior work demonstrating the prevalence of osteoarthritis in the amputee population. Conclusions: In agreement with our hypothesis, box plots showed trends of amputees with diabetes having the most narrowed joint space, followed by amputees

without diabetes, then diabetic controls, and healthy controls. While not statistically significant, these trends suggest amputees with diabetes are at increased risk of developing osteoarthritis compared to amputees without diabetes. Perhaps the aggressive management of blood glucose and post-amputation physiotherapy treatments could help reduce joint deterioration in these patients. Future work will focus on increasing sample size to assess if these findings are generalizable to a larger population. Increased risks of osteoarthritis can lead to pain, limited mobility, and decreased quality of life. This study can potentially inform clinical standards of care for patients with amputations. Earlier interventions such as proactive musculoskeletal screenings and targeted exercises may reduce risks of developing osteoarthritis, leading to improved clinical outcomes.

Mental Health Disorders among Truck Stop and Street Sex Workers

Abstract ID: UNTHSC77 Research Area: Pediatrics & Women's Health Presenter: Saloni Tandon Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

Saloni Tandon

Abstract:

Purpose: The prevalence of mental health disorders among the lowest tiers of the sex worker hierarchy is largely unknown. This group has been characteristically described as experiencing complex trauma, with factors that compound trauma such as mental illness, substance use disorders, and the engagement in survival sex just to meet basic needs. Knowing the burden of mental health disorders will inform what resources and training are needed at primary care and emergency centers to ensure compassionate trauma-sensitive care. We investigated the prevalence of mental health disorders among truck stop and street sex workers with experiences of survival sex and whether the prevalence of mental health disorders differed by race, age, and gender identity. Methods: A secondary data analysis was conducted using data collected from a cross-sectional study of street and truck stop sex workers in the Dallas-Fort Worth Metroplex (n=601, 2007-2013). Baseline demographics (race, gender, age) and prevalence of self-reported and diagnostic mental health disorders (DSM-IV Diagnostic Criteria) were abstracted from assessment forms completed on the street by mental health and social worker professionals. Chiâ€"square tests (\hat{I} + criteria < 0.05) were used to compare the prevalence of each mental disorder (bipolar, schizophrenia, major depression, suicide ideation) by gender (female, male, transgender), race (white, non-white), and age (< 35 years and 35+ years). Pearson's correlation coefficient was used to determine correlation between number of self-reported mental health disorders and number of physical health disorders and separately for the number of drugs. Results: Majority of participants were non-white (83%), 56% were 35 years of age or older, 4% self-identified as transgender, and 28% reported history of either physical and/or emotional abuse. At least one mental disorder was diagnosed in 83% of participants and 62% reported >1 mental disorder. Prevalence of bipolar disorder among non-whites was higher than that of whites. The prevalence of schizophrenia among those 35 years of age or older was higher than their younger counterparts. A significant correlation was observed between number of mental disorders and number of drugs used, but not with the number of physical health conditions. Conclusion: This analysis highlights the disproportionate mental health burden experienced by truck stop and street sex workers

with experiences of survival sex. Preliminary findings from this study suggest there are differences in the prevalence of mental health disorders between race and age, but not gender identity compared to the US population. Data suggests that comprehensive and integrated treatment trauma-informed approaches from health care, mental health, and substance abuse agencies may best be targeted to specific subgroups in this underserved population. Study protocols for this secondary analysis were approved by the North Texas Regional IRB (#2021-135), as were the original projects from which data were collected (IRB #2014-012 and IRB #2008-053).

Bridging the Gap â€" Partnering with Patients to Decrease Readmissions and Sustain Bronchiolitis Guideline Adherence

Abstract ID: UNTHSC75

Research Area: Pediatrics & Women's Health Presenter: Bethany Holley, MS, OMS-II Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Bethany Holley
- Tyler Hamby
- Stacey Vanvliet
- Stephanie Lavin

Abstract:

Purpose: Quality improvement (QI) methodology has been used successfully to create change packages that increase adherence to evidence-based guidelines. Few have proposed solutions that promote sustained adherence to guidelines after discharge from the emergency department (ED) or inpatient setting. We sought to design a comprehensive strategy to both de-implement unnecessary interventions in the inpatient setting and ensure quality patient care in bronchiolitis after discharge. Methods: This project was a quality improvement initiative consisting of targeted initiatives to address key drivers contributing to suboptimal bronchiolitis care. Specific interventions included provider and patient education, development of an internal clinical practice guideline (CPG), implementation of order set changes, providing patients with an effective nasal aspiration device for inpatient and home use, and creation of a focused hospital-based follow-up clinic that could be utilized for an additional 7 days beyond discharge. This study included patients from 2015 to 2020 who were aged >60 days to < 24 months with a diagnosis of bronchiolitis and without prematurity, significant cardiac, respiratory, or neurologic disease, or intensive care unit admission. Rates of chest radiographs (CXR), antibiotic, bronchodilator, racemic epinephrine, and systemic steroid use were compared across interventions. Results: Through provider education efforts, decreases were seen in albuterol (from 47.7% to 34.5%; P < 0.000) and systemic steroid use (from 14.2%-10.7%; P < 0.003). Continued provider education as well as clear patient educational materials allowed for additional reductions in albuterol (from 34.5% to 22.2%; P < 0.000), CXR use (from 47.9% to 37.6%; P < 0.000), and racemic epinephrine use (from 3.3% to 1%; P < 0.000). A final expansion of provider education and workflow improvements plus the addition of an outpatient care bundle further reduced use of albuterol (from 22.2% to 17.7%; P < 0.000), steroids (from 8.8% to 3%; P < 0.000), and antibiotics (from 16.2% to 7.4%, P < 0.000). This change

was sustained across 2 bronchiolitis seasons. Conclusions: Providing patients with education and resources to effectively manage bronchiolitis beyond hospital discharge can continue to drive adherence to evidence-based guidelines, improve patient outcomes, and enhance patient satisfaction.

Hypothetical Mechanisms for Increased Risk of Sudden Cardiac Death During Sleep in URM Populations

Abstract ID: UNTHSC74 Research Area: Health Disparities Presenter: Shefali Rai Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Shefali Rai
- Michael Smith

Abstract:

Purpose: Sudden cardiac death (SCD) is one of the leading causes of death. It is an unanticipated natural death from a cardiac pathology that occurs within an hour of onset of symptoms and no prior fatal condition. The majority of SCD are due to fatal arrhythmias. Prolongation of ventricular depolarization and repolarization, represented by the QT interval, affects impulse conduction and therefore increases the risk of these fatal arrhythmias. Additionally, SCD is presumed to be the primary cause of death during sleep including in underrepresented minority (URM) populations. Factors such as BMI and home environment can negatively impact sleep quality and potentially lead to increased susceptibility to sleep apnea and SCD within URM populations. Preliminary findings from our lab using a simulated obstructive sleep apnea (OSA) model demonstrates increased QT interval duration during sleep apnea and a follow-up study in patients with OSA as summarized below. This poster summarizes these prior findings and describes proposed studies to test the hypothesis that QT interval prolongation during sleep apneic events will be more pronounced in URM populations. Methods: We reviewed lab studies demonstrating the mean change in QT intervals throughout the night in individuals with sleep apnea. Preliminary Results: Individuals with OSA demonstrate prolonged mean QT intervals (> 400 ms). The mean QT interval duration during sleep apnea measured late in the night (433 ms) was longer than the interval measured early in the night (423 ms). The QT interval duration was longer in African American individuals (450 ms) when compared to Caucasian individuals (432 ms). Conclusion: Sleep apnea is associated with cardiovascular disease and can therefore potentially lead to increased risk of SCD in sleep. The OSA model lab studies show that sleep apnea can lead to prolonged QT intervals and a potential for URM to be at a greater risk of arrhythmia and SCD during sleep apneic events. This poster will focus on developing a new study for a series of physiologic studies to address the hypothesis that URM subjects with OSA are at increased risk of SCD during sleep. Student doctor Rai was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under

Award Number (R25HL125447). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Massage application to increase the spread of local anesthesia in sciatic nerve blocks: A cadaver study

Abstract ID: UNTHSC72 Research Area: Structural Anatomy Presenter: Taylor Robertson Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Taylor Robertson
- Cara Fisher
- Emma Handler
- Daniel Nash

Abstract:

Introduction: Sciatic nerve blocks are essential for surgical treatment of various lower limb pathologies. Due to the complexity and variation of anatomical landmarks, ultrasound (US) guided injection of local anesthesia has become common practice. In patients with thicker thigh girth (i.e., obese patients) excess tissue may distort US penetration thereby diminishing efficacy of the nerve block and/or cause severe post-operative pain. Dye tracing techniques have been used to test the effectiveness of nerve blocks, but there is little research on using massage to manipulate anesthetic spread. Therefore, the aim of this study is to assess the effects of massage to manipulate local anesthesia spread in sciatic nerve blocks. We hypothesize massaging after injection will increase the spread of local anesthesia compared to non-massage post injection. Methods: Forty un-fixed cadaveric legs were injected with a mixture of methylene blue dye and 2% Lidocaine Hydrochloride. Specimens were divided into non-massage (control) (n=20) and massage (n=20) groups. Sciatic nerve blocks were performed by a nurse anesthetist using US guidance at the popliteal fossa traveling proximally until the sciatic nerve was identified and the location was tagged. Immediately following, massage group specimens received five repeated proximally directed massages with the US transducer head. Specimens from both groups were then dissected to expose the sciatic nerve. Measurements of the distance traveled from marked site of injection to proximal end of dyed area were measured and compared. Results: Spread of local anesthesia in the inferior-superior direction was significantly higher in the massage group than the control group (pâ‰×0.05). Conclusions: Massaging post-injection caused a greater spread of local anesthesia during sciatic nerve block. Significance: Sciatic nerve block techniques often utilize nerve stimulation to identify the sciatic nerve location. This may be due to lack of US penetration through the gluteus maximus muscle. In patients with thicker thigh girth due to subcutaneous fat, imaging visibility may be more difficult as

well. Our findings suggest that clinicians may block the sciatic nerve at a more distal location with US guidance and manipulate the anesthesia to the region of interest

UTILIZING UNFIXED CADAVERS IN MEDICAL STUDENT ULTRASOUND TRAINING FOR NORMAL SCROTAL ANATOMY

Abstract ID: UNTHSC71 Research Area: Education Presenter: Garrett Jackson Submission Type: Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Garrett Jackson
- James Oh
- John Gibson
- Gavin Grieb
- Debini Banh
- Min Ji Son
- Alexander Thomas
- Shanon Quach
- Taylor Terlizzese
- Matthew Abella

Abstract:

Point-of-care ultrasound (POCUS) continues to become more widespread due to its range of use, low cost, and extremely high level of patient safety. It is imperative that we train medical professionals to utilize this tool in its fullest capacity as its diagnostic accuracy varies drastically with the skill and experience of the provider. Many programs recognize this discrepancy and have begun implementing POCUS earlier in training within medical school curricula. Despite these efforts, training across the broad application of POCUS continues to be underutilized in anatomy that is less accessible due to reservation amongst peers and patients. Testicular and scrotal anatomy is one of these sensitive areas that is lacking in early hands-on training. Ultrasound remains the first-line modality in the evaluation of scrotal disease. For emergent etiologies of acute scrotal pain or swelling, timing largely determines prognosis; any delay in care significantly increases risk of tissue necrosis, compromising the fertility of the patient. A solid foundation in acquiring and visualizing normal scrotal anatomy on the human body is an essential first step in creating the adept POCUS provider. Utilizing fresh, unfixed cadavers as ultrasound screening specimens for scrotal anatomy may be a feasible option for initiating early training in scrotal POCUS. Supported by the Willed Body Program, cadavers were screened with hand-held Butterfly iQ+ ultrasound devices by members of the ultrasound teaching assistant cohort of 3rd and 4th year TCOM students. Ultrasound acquired images and clips were reviewed and
evaluated by a trained faculty member. Of the images obtained 17 out of 20 cadavers (85%) adequately visualized pertinent structures of scrotal anatomy in the absence of significant imaging artifacts. The Butterfly iQ+ ultrasound provided excellent quality images with minimal artifacts; the scrotum is an easily accessible organ that avoids the early processes of decomposition which can obscure image acquisition. However, given the lack of blood flow, color and power doppler settings were unable to be adequately utilized. These settings are crucial in the diagnosis of certain scrotal pathologies such as epididymitis, varicocele, testicular torsion and orchitis. In conclusion, the provider's first time obtaining and assessing scrotal anatomy on a human body should not be in a time-limited, emergent situation. Fresh, unfixed cadavers can provide a means for closing the gap in providing scrotal anatomy training at the medical school level and ultimately elevate patient care. Benefits to this approach include: increased diagnostic and visualization skills of normal structures, augmented visuo-spatial and tactile probe-handling skills, enhanced ability to compensate for artifact and variations in anatomy, and practice handling the patient with professionalism and care. Future projects could include using cadavers to artificially replicate pathologic conditions for advanced training in diagnostic and procedural skills.

Intraparenchymal Brainstem Schwannomas in Pediatric Patients: Two Unusual Case Reports

Abstract ID: UNTHSC68 Research Area: Cancer Presenter: Haley Deville Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Haley Deville
- Sandy Cope-Yokoyama
- Madhan Bosemani
- Sibo Zhao

Abstract:

Background: A schwannoma is a tumor that originates from the myelin sheath of peripheral nerves. Intracranial schwannomas constitute 8-10% of primary brain tumors with many of these tumors associated with the vestibular nerve. Less than 1% of schwannomas are intraparenchymal with development unrelated to cranial nerves. Four pediatric cases have been previously documented in the English literature. Many developmental and nondevelopmental theories have been proposed to explain the histogenesis of these tumors; however, their origin is still largely unknown. This report details the cases of two children with intraparenchymal brainstem schwannomas both without neurofibromatosis and discusses the radiographic and pathologic characteristics of the lesions. Case Information: A previously healthy 8-year-old female presented with a history of ataxia, visual impairment, right hemiparesis, and school decline for approximately three months. Magnetic Resonance Imaging (MRI) revealed a fairly well-circumscribed lobulated mass arising from the right dorsal and lateral mesencephalon. The patient underwent a posterior fossa craniotomy with telovelar approach, and the intramedullary midbrain tumor was completely resected. Pathology best classified the tumor as schwannoma (WHO Grade I). Testing for neurofibromatosis was negative. There were no obvious immediate complications postoperatively; however, the following day the patient developed secondary hydrocephalus and later a right occipital ventriculoperitoneal shunt was internalized. Postoperatively, she had left hemiparesis, cranial nerve three and four palsies, aphasia, and hypertonia. Four years after the total resection, the patient had no evidence of residual tumor and remained with spastic hemiparesis, seizure disorder, and the presence of cerebrospinal fluid drainage problem. The second patient, a previously healthy 15-year-old female, arrived in the emergency department with diplopia and a headache which began the previous night. Anisocoria and ataxia were also noted; however, she did not present with a fever, vomiting, or history of a head injury. MRI revealed a complex partially cystic and partially enhancing

posterior fossa lesion involving the midbrain and pons. The patient underwent a left subtemporal craniotomy with gross resection of the tumor and a small residual cyst remained deep in the fourth ventricle with no evidence of immediate complications. The tumor was best classified as schwannoma (WHO Grade I) and genetic work up for neurofibromatosis was negative. Postoperatively, she experienced right hemiparesis, dystonic tone in her neck, and was very somnolent and labile. Six months postoperative, MRI showed no evidence of disease recurrence with a stable decompressed cyst; however, she continued to experience ongoing right hemiparesis and neuropathic pain. Her muscle strength and diplopia gradually improved. Conclusions: Further investigation is necessary to determine the exact origin of these tumors and to explain their unusual location. Also, considering the rarity of these tumors, they should always be considered during workup. Furthermore, it is important to obtain an intraoperative frozen section to obtain good patient outcomes as gliomas appear similar to schwannomas on MRI and are more likely to be found in the brainstem. Lastly, complete resection is more difficult in the brainstem; therefore, a partial resection and intracapsular decompression also may obtain favorable outcomes.

Ultrasound Microcredential: A Novel Method to Enhance Ultrasound Education

Abstract ID: UNTHSC67 Research Area: Education Presenter: Louisa Weindruch Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Louisa Weindruch
- Cassidy Miller
- Katy Wyszynski

Abstract:

Purpose: Over the last several years, access to ultrasound has increased dramatically, making point of care ultrasound (POCUS) a diagnostic standard across many medical specialties. It is cost effective, non-invasive, and becoming even more portable. Physicians can now take ultrasound where it previously was unavailable, such as rural areas, ambulances, and foreign countries for medical missions. Despite its expanded use and applicability, many medical schools remain behind in developing and implementing ultrasound education. Currently, the University of North Texas Health Science Center Texas College of Osteopathic Medicine (UNTHSC TCOM) integrates ultrasound education into the first and second years of medical education as part of their system courses, physical exam class, and simulations labs. To augment the ultrasound experience and improve students' skill set, UNTHSC has developed three ultrasound microcredential courses. The microcredential program is a two-day course that allows students, residents, and practicing physicians to earn a certification in a specific area of point of care ultrasound. Methods: Under the direction of Dr. John Gibson, students can enroll in one of three microcredential courses -- Primary Care, Obstetrics and Gynecology, or Emergency/Critical Care. Each course is divided into three parts. First, prior to attendance of the in-person workshop, students are required to complete the relevant online SonoSim modules. Secondly, students will attend the 10-hour in-person workshop that culminates with an evaluation of their ultrasound skills. Students are given the opportunity to practice on standardized patients with the help of trained ultrasound teaching assistants. In addition, they must correctly identify pathology and perform simulated ultrasound-guided procedures. Students must receive a certain number of points on a graded rubric during the in-person portion of the workshop. Lastly, following the workshop, participants are required to obtain images on their own using a Butterfly IQ ultrasound. These ultrasound studies are reviewed by UNTHSC faculty. Once students have completed and passed all three components of the workshop, they are awarded the microcredential for that course. Results: The goals of the

microcredential are twofold: to demonstrate an effective model for students to learn point of care ultrasound, and to expand ultrasound teaching to residents and attending physicians, to learn new techniques or build upon their current knowledge. We are in the process of evaluating our program using student feedback from a comprehensive post-workshop survey. Preliminary feedback has shown that students enjoy the workshop and find it an effective way to learn ultrasound. Conclusion: Overall, we hope that the UNTHSC POCUS Microcredential Program can be a model for other schools looking to advance their ultrasound training for both students and residents, practicing providers, and other members of their community.

Does Cholesterol Screening in Prader Willi Syndrome Represent an Opportunity to Reduce Cardiovascular Disease Risk?

Abstract ID: UNTHSC66 Research Area: Pediatrics & Women's Health Presenter: Emily Topham Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Emily Topham
- Sani Roy
- Luke Hamilton
- Don Wilson

Abstract:

Introduction: Hypercholesterolemia is a significant cause of cardiovascular disease (CVD) worldwide. Hypercholesterolemia screening guidelines include an initial lipid panel starting at 2 years-of-age with risk factors and 10 years-of-age for all children, regardless of risk status (3). Children with PWS develop a variety of health conditions, increasing their risk of premature CVD. Thus, this population should undergo global risk factor assessment, including cholesterol screening, starting at 2 years. In 2019, the American Academy of Pediatrics management guidelines for PWS included an initial lipid panel from ages 1-5 years (2,4). Case Presentation Case 1: A full-term male infant was admitted to the NICU for hypotonia and difficulty feeding. PWS was diagnosed by microarray paternal deletion of 15q11.2-q13. At age 3 months, growth hormone was started. He developed significant hypercholesterolemia with LDL-C of 236 mg/dL at 3.5 years (BMI < 5th percentile, TC 319, HDL-C 65, TG 71, Non-HDL-C 254). His father has hypercholesterolemia. Familial hypercholesterolemia (FH) genetic screening was negative. Renal, hepatic function and HbA1c were normal. At 3.5 years, a low normal T4 with inappropriately normal TSH was found and consistent with partial central hypothyroidism. He was treated with levothyroxine which normalized his T4; while the LDL-C improved but remained elevated (LDL-C 161). Statin therapy was deferred due to young age. Case 2: A male infant was admitted to the NICU for hypotonia and difficulty feeding. Methylation study confirmed PWS. At 5.5 years, he had hypercholesterolemia with LDL-C of 198 mg/dL (BMI >99th percentile, TC 274, HDL-C 41, TG 176, Non-HDL-C 233). Neither parent is known to have hypercholesterolemia. FH genetic screening was negative. Thyroid and renal function were normal; however, transaminases were very elevated without cholestasis. At 7.5 years, a statin was recommended but the family opted for ezetimibe. At age 9 years, he developed HbA1c of 11.1%, and had negative Type 1 diabetes antibodies, consistent with Type 2 Diabetes

Mellitus (T2D). He was treated with diet, insulin, and metformin. As HbA1c normalized (5.5%), the medications were discontinued. Discussion & Conclusion: The development of CVD in individuals with PWS is complex and risk factors are often underdiagnosed. Inherent to PWS are hypotonia and decreased muscle mass, leading to a 20% lower basal metabolic rate and decreased exercise tolerance. Combined with the development of insatiable appetite and hyperphagia, these factors often lead to cardiovascular disease risk (5). In adults with PWS, hypercholesterolemia was undiagnosed in 6%, T2D in 5%, hypertension in 3% (5). Risk factors associated with PWS contribute to premature mortality in this population and 70% die at a young age (29 Å \pm 16 years) (1). The presence of hypercholesterolemia or other risk factors, especially those present from an early age, greatly enhance future CVD-related risk, and represents a need for screening.

An unusual presentation of metastatic colorectal cancer mimicking cholangiocarcinoma

Abstract ID: UNTHSC64 Research Area: Cancer Presenter: Mallory Thompson Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Quinn Losefsky
- Mallory Thompson
- Parvez Mantry
- Alejandro Mejia
- Neils-Jorgen Dyrved

Abstract:

Background: While liver metastases are common in later-stage colorectal cancer (CRC), metastases that develop more than five years after a curative colectomy is extremely rare. Intrabiliary growth type of metastasis (IGM) is rare with a predicted annual incidence of 0.00067% in the United States. Case Presentation: A 67-year-old female was referred to hepatology by her primary care physician for management of elevated liver function tests in the setting of mixed hyperlipidemia. She had a history of Stage 1 CRC 10 years prior, which was treated with a hemicolectomy. Her most recent colonoscopy was performed five months prior. The initial workup included a liver biopsy and antimitochondrial antibody studies, both of which were normal and ruled out primary biliary cholangitis. Subsequent blood work revealed an elevated level of alkaline phosphatase. An MRCP was unremarkable and an MRI showed no biliary duct dilation or evidence of obstruction. In the setting of isolated ALP elevation and a negative workup for any other liver disease, a working diagnosis of an extrahepatic process for elevated ALP was assumed, and the patient was scheduled for follow up in six months. Six months later, the patient was admitted for an unrelated episode of gastritis. Serum studies taken during her admission showed elevated liver function tests. One month after discharge, she was seen in the office for follow-up and was complaining of abdominal pain; her liver enzymes remained elevated. A second MRCP revealed dilation of the right intrahepatic bile ducts which was highly concerning for underlying malignancy. A CEA and CA 19-9 were negative. An urgent endoscopic retrograde

cholangiopancreatography (ERCP) with brush cytology was unremarkable and the cytology was negative for malignancy. The patient continued to have abdominal pain and elevated liver function tests, and a second ERCP with cytology was performed. The ERCP revealed a focal stricture in the right hepatic duct. The patient subsequently underwent a balloon dilatation with stent placement. The second brush cytology was positive for malignancy. The

patient presented to the emergency department (ED) with complaints of upper abdominal pain and was admitted three days after her second ERCP. An abdominal computed tomography (CT) scan performed in the ED was negative for any obvious liver masses. The patient was discharged a few days later and was referred to surgery for a hepatectomy. A right hepatectomy was performed with no acute complications. On gross exam, the right liver lobe appeared slightly atrophic with no evidence of obvious masses. Histology revealed moderately differentiated adenocarcinoma (8.0 x 1.0 x 1.0 cm) with an intestinal phenotype, most consistent with colorectal adenocarcinoma. The patient underwent a colonoscopy and there was no evidence of recurrent colon cancer; CEA and CA 19-9 levels were within normal limits. Upon follow-up, the patient's ALP levels had improved and her liver enzymes were normalized. Conclusions: This case indicates that a new and unexplained biliary stricture could be a manifestation of metastasis even if no obvious mass is seen.

Are pre-operative urine cultures and cystoscopies before ureteral reimplantation clinically useful or cost effective?

Abstract ID: UNTHSC63 Research Area: Pediatrics & Women's Health Presenter: Dawson Hinkley Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Dawson Hinkley
- Erin Davis
- Mark Quiring
- Tyler Hamby
- Kristy Reyes
- Kirk Pinto

Abstract:

Purpose: Ureteral reimplantation remains the primary treatment for patients with vesicoureteral reflux (VUR) and recurrent urinary tract infections (UTI). Cystoscopies may be performed prior to reimplantation to rule out the presence of anatomic abnormalities, which may alter the procedure. Additionally, urine cultures may be obtained preoperatively for patients with VUR even if asymptomatic for UTI. The goal of this study was to evaluate whether preoperative urine cultures and/or cystoscopies offer a clinical advantage in pediatric patients undergoing ureteral reimplantation. Methods: Pediatric urologists responded to a 7-item survey to report their routine practices regarding urine cultures on asymptomatic patients and cystoscopies prior to reimplantation. Additionally, a retrospective review of patients who underwent ureteral reimplantation for VUR between March 2018 and April 2021 at Cook Children's Medical Center in Fort Worth, TX was performed. Variables included demographics, urine cultures, cystoscopies, whether cystoscopies altered the surgeons' planned procedure, and complications. Results: When physicians were asked how often they performed routine urine cultures before reimplantation on asymptomatic patients, 36% said never and 38% said always. Regarding performing cystoscopies at the time of reimplantation, 53% said never and 32% said always. For the retrospective review, 101 patients (28% male) met inclusion criteria. The median (range) age was 3.98 (0.56-10.93) years at surgery. Cystoscopies were performed in 46 (46%) patients and did not alter the surgical procedure for any patient. There were 20 (20%) preoperative, 90 (89%) intraoperative, and 61 (61%) postoperative urine cultures. Complications were associated with positive urine cultures intraoperatively and postoperatively but not preoperatively. Conclusion: Cystoscopies and asymptomatic urine cultures obtained prior to ureteral reimplantation provide limited to no additional benefit for

patients. Obtaining either without reasonable cause may bring about avoidable cost or inconvenience for patients and their families. Further research is needed to thoroughly identify the role that cystoscopies and urine cultures serve for patients undergoing ureteral reimplantation for VUR.

Older Adult Perceptions of Technology in Medicine

Abstract ID: UNTHSC61 Research Area: Aging / Alzheimer Presenter: Krystal Cruz Escobar Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (2nd Year)

Author(s):

- Krystal Cruz Escobar
- Matthew Nguyen

Abstract:

Purpose: Technologies' growing involvement in health care has led to continuous improvement in efficiency and quality of care, but specific challenges lie with addressing the barriers that impair the geriatric population from benefitting the use of new technology. The purpose of this quality improvement initiative was to obtain feedback from older adults and their caregivers regarding a new electronic check in process in a geriatric primary care clinic. Methods: A cross sectional survey was administered to 70 older adults aged 65 and older between May â€" October 2021. Outcomes of interest included Internet access, device access, as well as user confidence with technology, and ability to effectively utilize new technologies. Results: Findings indicated 40% of the primary population were unable to complete the electronic check-in themselves; defaulting to assistance from their caregivers; who reported ease in completing the check in process. An average of 68% of participants reported an interest in learning more about technology from their health care provider. Our results indicate that although the geriatric population faced some hardship in navigating the online check in system, they are willing to adopt and learn about new technology. Conclusion: These findings provide a basis for how physicians can meet patient expectations and provide a future avenue of patient education to improve quality care to the geriatric population.

Extensor Tendon Injury Outcomes Based on Zone of Injury

Abstract ID: UNTHSC60 Research Area: Structural Anatomy Presenter: Hayyan Yousuf Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (2nd Year)

Author(s):

- Hayyan Yousuf
- Laura Garcia
- Stewart Dalton
- William Pientka

Abstract:

Purpose: Extensor tendons are located on the dorsal surface of the hand, however they lie superficially and are protected only by a thin layer of soft tissue. This makes them vulnerably to injury and morbidity. There are established anatomical zones of the hand which allow surgeons to classify injury locations, and previous studies have explored the link between zone of injury and outcomes following surgery. This has been well studied for the flexor tendons (ventral surface of the hand), but is still poorly characterized for the extensor tendons. In the present study, we aim to determine which zones are more amenable to surgical repair, and what unique factors may impact surgical outcomes for each zone. Methods: We have conducted a retrospective chart review of patients who have undergone extensor tendon repair surgery at JPS Health Network since 2012. Results: Our data collection revealed that zones 1-4 had statistically significant worse final flexion TAM when compared to zones 5-8. Conclusion: Our preliminary data analysis suggests that there is a statistically significant difference in the outcomes of different zones of injury, and therefore each zone deserves unique considerations prior to surgical repair. This is possibly due to the fact that the more proximal zones generally have more complex injury patterns.

Variation of Best Fit Distributions in Single Cell Virus Dynamics Models

Abstract ID: UNTHSC59 Research Area: Microbiology / Infectious Disease Presenter: Madison Doty Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Madison Doty
- Hana Dobrovolny

Abstract:

Purpose: Mathematical modeling of viral kinetics can be used to gain further insight into the viral replication cycle and virus-host interactions. However, many of the virus dynamics models do not incorporate the cell-to-cell heterogeneity of virus yield or the time-dependent factor of virus replication. A recent study of vesicular stomatitis virus (VSV) kinetics in single BHK cells determined that both virus production rate and yield of virus particles varies widely between individual cells of the same cell population. Methods: Here we use the results of the previously mentioned study to determine the distribution that best describes the time course of viral production within the single cells. We determined a list of eight potential distributions that are commonly used in viral kinetics models to fit to each data set by minimizing the sum of squared residuals. The model of best fit for each individual cell was determined using Akaike's Information Criterion (AICC). Results: Results of this study show that the distribution that best describes viral production varies from cell to cell. Conclusion: This finding could have further reaching implications for incorporating time-dependent viral production into a standard model of virus kinetics in order to better reproduce the diversity of viral replication that occurs over time within a population of cells.

A NEW ERA: TARGETED THERAPY FOR RECURRENT GLOMUS TUMOR

Abstract ID: UNTHSC41 Research Area: Cancer Presenter: Annum Faisal Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (3rd Year)

Author(s):

- Annum Faisal
- Anish Ray

Abstract:

Background: Glomus tumors (GT) are rare, vascular, benign soft tissue neoplasms that are composed of cells resembling modified smooth muscle originating from glomus bodies. Glomus bodies are specialized forms of arteriovenous anastomosis found in the reticular dermis that serve as thermoregulators. These glomus bodies are highly concentrated in the hands and feet, and thus, GT typically present as solitary lesions in the subungual region but may also occur elsewhere in the skin and soft tissues. Classically, GT are diagnosed with the following triad of symptoms: focal tenderness, spontaneous pain, and temperature sensitivity. Total surgical excision remains the mainstay of treatment. Here, we describe an atypical case of multifocal GT resistant to surgical excision and discuss alternative treatment modalities for recurrent cases in a pediatric patient. The treatment of recurrent GT remains a challenge due to lack of literature supporting alternative options. Management is especially difficult following a series of failed surgical excisions. Our objective is to explore the efficacy of non-surgical targeted-therapy treatment for recurrent GT based upon molecular genetic findings. Case Information: A 16-year-old female with a history of multifocal GT status post prior extensive removal through medial and lateral incisions in 2012, 2013, and 2015 presented back in 2021 with significant pain and swelling of the right lower extremity. History and PET Scan imaging confirmed extensive recurrence where the prior neoplasms had been present. Specifically, PET Scan demonstrated multifocal uptake within numerous masses in the right calf and ankle. Molecular genetic testing of GT in this patient revealed genomic changes in the platelet-derived growth factor receptor gene (PDGFR \hat{I}^2 - R561 E563>Q). This gene transcribes platelet-derived growth factor receptor beta (PDGFR \hat{I}^2), which is part of a family of proteins called receptor tyrosine kinases. Accordingly, the patient started Sunitinib, a multi-receptor tyrosine kinase inhibitor which decreases phosphorylation of PDGFRÎ² and subsequently inhibits proliferation and survivability. Initially, treatment was intermittently held due to side effects of syncope, rash and plantar erythrodysesthesia. Nevertheless, as a result of improvements in pain and size of the tumors, she resumed treatment at a lower dose. Following trials of two dose

reductions, she tolerated the medication well with resolution of side effects. The patient continued to note a decrease in the size of her GT, confirmed by imaging and her ability to return to work successfully. Conclusions: This case highlights the insufficiency in current mainstay treatment options of GT with surgical excision. Our findings emphasize the significance of incorporating molecular genetic testing into the treatment and management of recurrent GT to prevent disease relapse. Further research into alternative gene therapies is warranted.

Effects of Osteogenesis Imperfecta on the Cochlea and Sensorineural Hearing

Abstract ID: UNTHSC40 Research Area: Structural Anatomy Presenter: Lila Athena Huston Submission Type: Competition Poster Department: GSBS: Physiology & Anatomy Classification: GSBS Student

Author(s):

- Lila Huston
- Rachel Menegaz
- Emma Handler
- Jason Organ
- Lauren Gonzales

Abstract:

Background: Osteogenesis imperfecta (OI), a developmental disorder of type I collagen, is known to cause hearing loss in $\sim 60\%$ of the diseased population. Identified forms include conductive hearing loss (17.4% of OI patients), involving loss of function within the ossicular chain, and sensorineural hearing loss (25.8%), resulting from damage to the cochlea, with the most predominant form being mixed hearing loss (56.8%), involving damage to both the cochlea and ossicles. While OI-related pathologies have largely focused on the middle ear, the pathological appearance of the cochlea (the organ most often compromised in OI-related hearing loss) has gained little focus. In this study, we examine OI-related pathologies on the cochlea in a mouse model for the severe type III OI, to document 1) any visible variation between WT and OI variants, and 2) assess the encroachment of the otic capsule onto the cochlea by analyzing differences in duct volumes. We hypothesize that cochlea in mice with OI will have less consistent morphology overall than their WT counterparts due to abnormal growth of the bony capsule. Methods: 16 week old OIM mice (B6C3Fe a/a-Col1a2oim/J) (n=6) were compared to unaffected wildtype (WT) littermates (n=6) with no known hearing defects. High-resolution micro-CT scans were created for all specimens and 3D models and volumes of the cochlea were generated using 3D Slicer software. Two-tailed Mann-Whitney U-tests were used to investigate differences between 1) right and left ears of the same mouse to examine intraindividual symmetry and 2) differences in volumes between WT and OI cochlea. Results: No major morphologic differences between OI and WT were observed, except for minor areas of higher ossification at the base of the cochlea, mostly within the OI sample. Within WT specimens, we observed little intraindividual difference in the cochlear volume (0-3%). Within OI specimens, significant differences were observed in cochlear volume between right and left ears in the same animal (4-15%; p < 0.05), indicating potential unilateral effects. When average WT

and OI volumes were compared, there was much overlap between the two samples although the OI volumes had a significantly larger range than the WT range (Mann-Whitney U, p< 0.05). Discussion: Overall, our results indicate that mice with OI are much more likely to have evidence of unilateral cochlear volume losses, despite very little difference in overall shape appearance, possibly due to bony capsule encroachment. This find indicates an extremely high potential for sensorineural and mixed hearing loss in OI-bred mice and elucidates at least one mechanism behind how this type of hearing loss might be occurring. Little is known about the pathological appearance of the cochlea in OI, leading to difficulty in managing hearing loss. Further investigation of the etiology and progression of cochlear pathologies will allow for better outcomes in hearing for those patients afflicted with OIrelated hearing loss.

Determining optimal wearable sensor location for detection of differences in younger versus older adults.

Abstract ID: UNTHSC38 Research Area: Physical Medicine / OMM Presenter: Olivia Panchal Submission Type: Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Olivia Panchal
- Yein Lee
- Sarah Moudy

Abstract:

Objectives: Previous studies have assessed the efficacy of wearable sensors in detecting differences between younger and older adults or non-fallers and fallers as a means for predicting fall risk in these populations. Numerous combinations of variables (e.g., acceleration, step length, stride duration, and harmonic ratio) have been measured using various sensor locations (e.g., iliac crest, sacrum, dorsal foot, femur, and shin). Currently, there is no consensus among researchers regarding the ideal sensor location for detecting significant differences in these variables between either younger and older adults or nonfallers and fallers. Therefore, the purpose of this study was to determine if common fall risk variables are able to detect differences in relatively healthy younger and older adults as a means for earlier-onset fall risk detection and determine optimal sensor location to make these measurements easier in a clinical setting. We hypothesized that older adults would demonstrate decreased average range of acceleration and the sacrum would be the optimal sensor location for detecting differences in acceleration because of its close proximity to the center of mass. Design: 12 participants voluntarily enrolled and were divided into 2 groups based on age (18-35 and >60 years). Subjects performed a 2-minute treadmill walking task at a self-selected habitual pace. Wearable sensors were placed on the sacrum, lateral femur, and anterior tibia bilaterally. Sensors measured linear acceleration in the anteroposterior (AP), mediolateral (ML), and vertical (V) directions. The average range of acceleration across 10 gait cycles was calculated for each subject. Results: No significant differences in acceleration were found between groups in the AP and V directions for sensors placed at the sacrum ($p\hat{a}$ ‰ ± 0.317) and lateral femur ($p\hat{a}$ ‰ ± 0.054) or in any direction for sensors placed at the anterior tibia (p≥0.395). ML acceleration was significantly decreased in the older adults group at the sacrum (Younger=8.83Å ± 1.05 m/s2, Older=7.09Å ± 1.09 m/s2; p=0.034) and the right lateral femur (Younger=37.58Å ± 17.00 m/s2, Older=27.33Å ± 4.85 m/s2; p=0.017). Conclusion: With the exception of ML acceleration, acceleration was not found to be significantly different between groups.

Significant differences in ML acceleration measured at the sacrum and lateral femur are consistent with previous studies. Compared to AP and V acceleration, hip sway during walking as measured by ML acceleration is more prominent and easier to detect in a clinical setting. Greater side-to-side sway could correlate with instability and thus, an increased risk of falls. Therefore, ML acceleration may be an important variable to focus on in future studies emphasizing earlier fall risk detection in healthy adults. The results suggest sacrum and lateral thigh (rather than anterior tibia) sensors would be more advantageous at detecting differences in acceleration in such studies.

Giant multilocular prostatic cystadenoma in a 14-year-old male: A case report

Abstract ID: UNTHSC36 Research Area: Pediatrics & Women's Health Presenter: Mark Quiring Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Mark Quiring
- Stacey Berry
- John Uffman
- Kirk Pinto
- Jonathan Kaye

Abstract:

Background: Giant multilocular prostatic cystadenoma (GMC) is a rare, benign tumor that originates from prostatic tissue, comprising of glandular and cystic epithelial tissue. The pelvic mass is typically located within the rectovesical pouch and does not usually invade surrounding tissue, although variations have been reported. Common symptoms include abdominal pain, urinary retention, and dysuria. Reported cases have ranged from 16 to 80 years old, with the first known case described in 1990. Here, we present the case of the youngest patient reported to date with GMC. Case Information: A fourteen-year-old male presented to the Emergency Department (ED), accompanied by his mother, with complaint of severe, intermittent abdominal pain with two episodes of emesis, onset 12 hours prior. The physical exam demonstrated an ill-defined abdominal mass localized over the right lower quadrant. The mass was confirmed on ultrasound, measuring 17.0x13.8x12.3cm, and appearing heterogeneously solid and cystic in nature. MRI demonstrated hydroureteronephrosis with suggestion of bladder compression. Labs showed elevated creatinine, revealing possible obstructive uropathy. To alleviate ureteral and bladder obstruction, the patient underwent attempted placement of bilateral ureteral stents. Once the cystoscopy was performed, however, neither ureteral orifice could be observed. The next day, the patient underwent excision of the pelvic mass. The surgeon identified and removed the multiloculated cystic mass, found within the retropubic space. Approximately two liters of brown fluid was drained from the tumor. The histology was consistent with giant multilocular prostatic cystadenoma. Four months post-excision, MRI demonstrated no evidence of residual lesion and interval resolution of hydroureteronephrosis, and the patient's symptoms had resolved. Conclusion: GMC of the prostate is an extremely rare benign tumor, with less than 40 known cases, and less than five occurring in patients younger than 30. GMC is most likely to be misdiagnosed due to its rarity and heterogenous

nature. While most known cases have been treated with surgical excision with good outcomes, there have been cases of recurrence and co-involvement with malignant cells. Therefore, follow-up is vital for these patients. Here, our case further reveals that GMC and tumors alike can occur in the pediatric population, and thus in young males with pelvic masses of unknown origin, CMC should be considered.

Development and Validation of a Novel RP-HPLC Analytical Method for Quantification of Amphotericin B

Abstract ID: UNTHSC34 Research Area: Pharmaceutical Sciences Presenter: Jaylen Mans Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: GSBS Student

Author(s):

• Jaylen Mans

Abstract:

Amphotericin B (AmB) is an antifungal and antiparasitic natural product. AmB is biosynthesized through bacterial fermentation of Streptomyces nodosus. For decades researchers have been investigating new methods to improve the drug formulation. However, drug development research requires validated quantitative analysis techniques to accurately measure drug concentrations. Previously, AmB has been quantified by one of several reverse phase-high performance liquid chromatography (RP-HPLC) that have been reported in literature. However, these methods rely on relatively high disodium EDTA concentration in the mobile phase to separate AmB from its impurities. As a chelating agent, EDTA can bind to metal surfaces within HPLC instrument. Over time this effect can be detrimental, as excess EDTA can precipitate out of solution and negatively impact the integrity of internal instrument components or column performance. Further, reported RP-HPLC methods have relatively high sample run time (> 35 minutes) due to their reliance on isocratic separation. Shorter Run times (< 20 minutes) are desirable for HPLC analytical methods due to the reduced cost mobile phase, as well as to prolong lifetime of detector lamp and stationary phase column. The purpose of this work is to develop and validate a new alternative HPLC method with shorter run times that avoid high EDTA usage. Our developed method achieves a shorter run time by utilizing a gradient HPLC method and avoids the use of EDTA by replacing the agent with 0.2% Acetic Acid.

The Emerging Role of the Pharmacist in Managing Poisoning Cases: A Systematic Review

Abstract ID: UNTHSC33 Research Area: Education Presenter: Payton Simpson Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

Payton Simpson

Abstract:

Purpose: In 2019, a total of 2,573,180 calls were made to poison control centers across the United States. This equates to 1 exposure every 15 seconds, and of the top 10 agents reported in exposures, 5 were pharmaceutical products or prescription medications. This presents the question, what went wrong in these cases? While many poisoning exposures are accidental, some can be attributed to either a lack of knowledge regarding the proper use of the product or improper storage. With prescription medications listed among the top agents, there is a growing need for pharmacists to prevent, and treat poison exposures. The objective of this study was to review the literature and assess the role of the pharmacist in managing poisoning cases. This review aimed to analyze the pharmacist's specific role, associated duties, and necessary skills. A secondary objective was to analyze the literature for common practice sites of pharmacists and describe barriers to participation in poisoning cases. Methods: A systematic review of the current literature was performed using PubMed and SCOPUS. The search included a combination of terms "pharmacistâ€□ and "poisonings. $\hat{a} \in \Box$ Articles dated 2000 to 2020 were included to reflect most current practice. Articles were excluded if they were not from the U.S., not directly related to poisonings, or if the full text was unavailable. Search results from each database were exported to Microsoft Excel and sorted for removal of duplicate citations. Articles were graded on the Oxford scale based on study design and quality of evidence. Data reported from each article was categorized by: study objective, intervention, practice site, pharmacists' role, and skills needed. Additionally, barriers or challenges to pharmacist participation in poisoning cases were documented. Results: The search results from PubMed using search terms \hat{a} €~pharmacist' and \hat{a} €~poisonings' yielded 462 articles. The same search terms in SCOPUS yielded 287 articles, after duplicates were removed there was a total of 666 articles. Records were screened and 591 were excluded with 74 remaining to be assessed for fulltext eligibility. Ultimately, 36 full-text articles were assessed and utilized. Article types included retrospective analyses, editorials, surveys, and case reports. When examining the literature for the role of the pharmacist; collaboration and education were the most frequently documented roles. Further specified roles included knowledge of antidotes,

supportive care, patient presentation of common poisonings, protocol development, and program implementation. Common practice sites included: Poison Control Centers, hospitals, and community settings. Many articles presented opportunities for pharmacists to intervene however, pharmacists must overcome barriers and challenges. These included but were not limited to: lack of toxicology training, limited pharmacist involvement on the healthcare team, and no documentation of interventions. Conclusions: As drug therapy experts and one of the most accessible healthcare providers, pharmacists can serve a vital role on the healthcare team. Through toxicology training and collaboration with other providers, pharmacists can aid in the treatment of these cases, and in preventing future exposures. In the future, pharmacists should be included in the care and management of poisoning cases.

Retrospective Analysis of Unintentional Firearm Injuries in Children Presenting to a Pediatric Emergency Department

Abstract ID: UNTHSC31

Research Area: Pediatrics & Women's Health Presenter: Abigail Rodgers, OMS-II Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Abigail Rodgers
- Daniel Guzman
- Tyler Hamby
- Kristy Reyes

Abstract:

Background: In the US, firearm injury has been documented as the second leading cause of death in children and adolescents - causing 15.4% of deaths in 2016. Research has indicated that the main danger comes from the accessibility of firearms to children, their siblings, and friends. Purpose: The aim of this study is to identify trends and potential factors that place children at higher risk for unintentional firearm injuries. We specifically compared the outcomes and differences between powder guns and air-power guns. This information will be helpful in developing curriculums for injury prevention. Methods: A retrospective cohort study was conducted using medical records from Cook Children's Health Care System (CCHCS). To be included, patients had to be less than 19 years of age and have presented at the CCHCS emergency department (ED) with an unintentional firearm injury between January 1, 2015 and June 30, 2021. For each patient, we recorded data on type of gun, location and scenario of the shooting, and location of injury on patient's body. Results: Two hundred four patients met inclusion criteria. There were 59 (28.9%) shootings by powder guns, including handguns (24.0%), shotguns (2.9%), rifles (1.0%), and unreported (1.0%). The other 145 (71.1%) shootings were by air-power guns, including BB (48.5%), pellet (14.7%), air (4.9%), nerf (2.5%), and paintball (0.5%) guns. Shootings most commonly occurred in the patient's home (76.5%), a friend's home (12.3%), or a family member's home (3.9%). Compared with air-power-gun shootings, powder-gun shootings were statistically significantly more likely to take place outside the patient's home (35.6% vs. 18.6%, p< 0.0001, OR=2.61). The most common locations of gunshot wounds were extremities (44.1%), the face (37.3%), and head or brain (15.2%). Compared with those shot with air-power-gun shootings, powder-gun shootings were significantly less likely to injure the face (22.0% vs. 43.4%, p=0.004, OR=0.37). Upon discharge, 131 patients (64.2%) went home, 65 (31.9%) went to the floor, 2 (1.0%) were

transferred to another facility, and 6 (2.9%) decreased. Compared to those shot with airpower guns, patients shot with powder guns were significantly less likely to be discharged home (32.2% vs. 77.2%, p< 0.0001, OR=7.15). Conclusion: Most shootings were by airpower guns. Although most of these were minor injuries, we suggest that children should have proper supervision while these guns are in use. Shootings most commonly occurred in the homes of the patient, friends, or family members. We suggest that many of these unintentional gun injuries could be prevented by use of proper storage and safety measures. The majority of incidents were caused by injury to the face, head, or brain. We suggest that safety equipment such as protective eyewear should be worn when handling firearms to decrease these unintentional injuries.

Neuroprotection of human and rodent retinal ganglion cells by a hybrid antioxidant-nitric oxide donor small molecule, SA-2

Abstract ID: UNTHSC30 Research Area: Eye / Vision Presenter: Jennifer H. Pham Submission Type: Competition Poster Department: North Texas Eye Research Institute Classification: GSBS Student

Author(s):

- Jennifer Pham
- Gretchen Johnson
- Suchismita Acharya
- Dorota Stankowska

Abstract:

PURPOSE: Current treatments of glaucoma are aimed at lowering intraocular pressure (IOP), which is a key driver of retinal ganglion cell (RGC) death. Another contributing factor to RGC death is exposure to reactive oxygen species (ROS). At present, there is no FDAapproved neuroprotective treatment to prevent glaucomatous optic neuropathy and loss of RGCs. Our novel hybrid molecule, SA-2, contains both a nitric oxide (NO) donating group to lower IOP and a ROS scavenging group to protect RGCs. We hypothesize that SA-2 will inhibit the death of RGCs in an in vitro and an ex vivo neurotrophic factor deprivation model. METHODS: Retinal punches from human explants (n=4 donors/experiments) were isolated and treated with either SA-2 [1 mM] or vehicle and maintained without neurotrophic factors for 7 days ex vivo. In each experiment, 4 baseline retinal explants were collected on day 0. At the end of the experiment, explants were immunostained with RBPMS and Brn-3a (RGC-specific markers) and cell survival was analyzed. In three biological replicates, primary RGCs were isolated from rat pups and treated with either SA-2 (1 mM, 100 \hat{I} (4M) or vehicle with or without neurotrophic factors for 48 h. Active caspase 3 and 7 assay was performed and apoptotic cell counts were analyzed. In another set of experiments, rat retinal explants were isolated and incubated with tert-Butyl hydroperoxide (TBHP) along with either SA-2 [1 mM] or vehicle for 2 h (n=2-4 explants/group). Production of superoxide by mitochondria was assessed using MitoSOX reagent according to manufacturer instructions. All cell counts were performed in a masked manner using ImageJ Software. One-way ANOVA or nonparametric Kruskal-Wallis was used for statistical analysis by GraphPad Prism 9 Software. RESULTS: In ex vivo human retinal explants, there was a significant increase in RGC survival by 39% in the SA-2 treated group compared to the vehicle group at day 7 (p < 0.0001). In rodent primary RGCs, SA-2 mediated a significant decrease in apoptotic cells by 30% (p< 0.01) and a 67% (p< 0.05) decrease in dead cell

count. In rodent retinal explants, there was a significant decrease (by 59%, p< 0.0001) in the production of superoxide by mitochondria in the TBHP and SA-2 treated group, compared to the TBHP vehicle group. CONCLUSION: SA-2 was shown to be effective at preserving retinal ganglion cell survival in human retinal explants, rat retinal explants and primary rat RGCs by preventing apoptosis and protecting the cells from oxidative stress.

Prevalence of Specific Mental Health Issues in Families that have Family Meals

Abstract ID: UNTHSC29 Research Area: Pediatrics & Women's Health Presenter: Ashlyn Fairchild Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Ashlyn Fairchild
- Shane Fernando
- Naser Asfoor
- Nusrath Habiba
- Kimberly Fulda

Abstract:

Purpose: Anxiety, depression, and Attention-deficit/hyperactivity disorder (ADHD) are some of the most prevalent mental health issues in the U.S. These mental health issues have seen an increase in diagnosis over the past few decades. A simple intervention, family meals, could be associated with improved mental health of children. This study assesses the effect family meals could have on the mental health of children aged 10-14. Methods: This cross-sectional study will examine the potential associations between parental mental health, child mental health and frequency of family meals to understand how common mental issues such as ADHD, depression, and anxiety could be mediated. Data comes from an IRB-approved dataset collected from 10 to 14-year-old patients attending an outpatient pediatric clinic in Fort Worth, Texas. Univariate and regression models were performed on the variables of interest. Results: Out of 152 surveys, 21 adults had above average depression scores, 32 children had above average depression scores, 19 children had ADHD, and 7 children had anxiety. There was a 12.4% reduction in adult depression scores and a 15% reduction in childhood depression scores with an increased frequency of meals eaten together. Neither ADHD nor anxiety had a significant association with frequency of meals. Conclusion: Increased frequency of family meals could be a mediating factor for both adult and childhood depression. However, this data did not show a significant association between increased family meals and childhood anxiety or ADHD. Future studies should look further into the impact of family meals on the mental health of both adults and children.

Practice Effect and Cardiorespiratory Response to Cognitive Test-Retest with Aging

Abstract ID: UNTHSC26 Research Area: Aging / Alzheimer Presenter: Priyanka Reddy Submission Type: Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: TCOM DO Student (2nd Year)

Author(s):

- Priyanka Reddy
- Kulsum Abdali
- Sarah Ross
- Sandra Davis
- Xiangrong Shi

Abstract:

Background: This study aimed to examine the age-related difference in practice effect on cognitive performance and cardiorespiratory frequencies during test and retest with the same materials in different cognitive domains. Methods: Twenty cognitively normal older and younger men and women $(65\hat{A}\pm 2 \text{ vs } 26\hat{A}\pm 1 \text{ years old})$ provided the informed consent (approved by IRB) and participated in cognitive test and retest using Mini-Mental State Examination (MMSE), Digit-Span, Trail Making Test (TMT-B), and California Verbal Learning Test (CVLT-II) with \sim 3 weeks apart. During the testing, heart rate (HR) and breathing frequency (BF) were continuously monitored from electrocardiogram and plethysmograph. ANOVA was applied to examine the significance of the age and retest factors. Results: All cognitive performances were not affected by the age factor or the retest factor except CVLT-II. Baseline cognitive performances of the older vs younger groups were $27.7\hat{A}\pm 1.1$ vs 30.5±0.7 (P=0.034) in CVLT-II total Free-Recall, 29.2±0.4 vs 29.6±0.2 in MMSE, 15.6±1.6 vs 16.7±1.2 in Digit-Span, and 58.8±6.4 vs 48.0±3.6 in TMT-B, respectively. The retest factor only significantly improved total Free-Recall in the younger group (P=0.002). Baseline HR and BF were not different between the two groups, older vs younger: 72±5 vs 80±3 beats/min and 17±1 vs 16±1 breaths/min. Both HR and BF were significantly augmented (P < 0.01) in response to the cognitive test. However, both these responses were significantly attenuated during the retest (the retest factor P < 0.01). Only HR, not BF response was significantly affected by the age factor. Conclusions: There was no practice effect on cognitive performances in MMSE, Digit-Span, and TMT-B in both older and younger subjects. Total Free-Recall was significantly improved in the younger subjects only during the retest. There was a practice effect on the cardiorespiratory responses to cognitive challenge, which were significantly reduced during the cognitive retest. Aging significantly diminished HR response during cognitive challenge.

Bowel Associated Dermatosis Arthritis Syndrome

Abstract ID: UNTHSC25 Research Area: Other Presenter: Aya Hasan Submission Type: Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Aya Hasan
- Leisa Hodges

Abstract:

Background: Bariatric surgery is the most effective weight loss therapy available for patients with morbid obesity and can be considered when non-operative means such as diet and exercise, nutritional counseling, and weight loss programs have failed. Gastric bypass surgery may produce malabsorptive or surgical complications, which can result in nutritional deficiencies as well as syndromes related to bacterial overgrowth in the blind loops of bowel created, known as Bowel Associated Dermatosis Arthritis. Case Presentation: A 37-year-old female presented with a pruritic rash for 3 months. It was initially located on her inner thighs and spread to involve her feet, groin, abdomen, arms, and hands. She complained of intense vaginal itching as well. She had been treated unsuccessfully with multiple agents that included oral and topical antifungals, permethrin 5% cream, triamcinolone cream, and cetirizine without improvement in her itching. She had a history of gastric bypass surgery for obesity 6 months prior to onset of the symptoms. Her past medical history was significant for type 1 diabetes mellitus, diabetic neuropathy, hypertension, hyperlipidemia, rheumatoid arthritis, depression, and hypothyroidism secondary to I131 ablation for Graves disease. Examination revealed eczematous plaques on her hands, feet, and ankles with confluent erythema on the lower legs that partially blanched. Erythema and edema of the tongue, and fissures of the oral commissure with erythema were noted as well. The findings were consistent with a nutritional deficiency. She was started on crushed B vitamins, Zinc, and Vitamin C. Improvement of the glossitis, angular cheilitis, and rashes were noted with no new petechiae seen at one-week follow-up. Nine months later, we were again consulted on this patient for a recent onset of painful skin abscesses that were being treated with incision and drainage, intravenous vancomycin, and topical mupirocin. After incision and drainage, the lesions were noted to be healing poorly and were more painful. Examination revealed eczematous plaques with sharply defined borders on the upper and lower extremities, including the palms and soles, and trunk. An exquisitely tender erythematous nodule with central pustule and crust was seen on the left occipital scalp. Histopathologic examination of the scalp nodule showed psoriasiform hyperplasia with a focal area of ulceration along with a diffuse infiltrate of neutrophils throughout the dermis. PAS, Fite, and

Brown-Brenn stains were negative. The histopathology was consistent with bowelassociated dermatosis-arthritis syndrome. She was treated with broad-spectrum antibiotics and colchicine. Following successful treatment of this patient's skin manifestations caused by complications secondary to her bariatric surgical procedure, the patient continued to lose weight despite adequate dietary caloric and protein intake. Her bypass procedure was reversed, and the patient's skin eruptions completely resolved. Conclusion: This case demonstrates the complications that can arise because of alterations made in the gastrointestinal anatomy. With a limited number of cases, bowel-associated dermatosisarthritis is a clinically important syndrome to recognize because these patients, as was our patient, can be subjected to non-therapeutic repeated incision and drainage procedures.

Hydrodissection for Treatment of Vascular Thoracic Outlet Syndrome

Abstract ID: UNTHSC24 Research Area: Cardiovascular Presenter: John M. Ver Hoef Submission Type: Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (3rd Year)

Author(s):

• John Ver Hoef

Abstract:

The following case explores the effectiveness of a new treatment modality in the case of vascular thoracic outlet syndrome (vTOS). Few conservative treatments exist for use in alleviating symptoms of vTOS. In this case, a 25 year old male was diagnosed with vTOS 4 months prior to presentation. A combination of poor posture, inactivity, and protruding screws from a previous clavicle fracture repair were compromising the subclavicular vasculature. Symptoms of claudication and a cold right arm/hand led to the patient seeking medical treatment. He had failed physical therapy and pharmacotherapy, was told by a vascular surgeon that he was a surgical candidate. He sought non-surgical options for treatment, and after exploring possible remedies, hydrodissection was chosen for its potential merit in this case. After utilizing the treatment and decompressing the subclavicular neurovascular bundle, the patient reported immediate alleviation of his symptoms. After a 2 week and 3 month follow up, the patient still reports 100% reduction in symptoms with no recurrence. Though there is a lack of literature to support the use of hydrodissection to treat vTOS, this was a specific case in which hydrodissection demonstrated to be an effective treatment modality. The specific utilization of hydrodissection should be studied more in order to increase the literature base and increase awareness of its potential effectiveness for this and similar conditions.

Parent and Teen Feedback on a Prototype of a Novel Parent-Based Intervention for Adolescent Alcohol Use and Social Networking Site Use

Abstract ID: UNTHSC19 Research Area: General Public Health Presenter: Morgan Abigail Seamster Submission Type: Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: Dual Degree Student

Author(s):

- Morgan Seamster
- Emma Kannard
- Raul Resendiz
- Travis Walker
- Melissa Lewis
- Dana Litt

Abstract:

Purpose: Social networking site (SNS) use has been associated with increased alcohol use and risky health behaviors in adolescents. Previous research has demonstrated the role of parents in mitigating the adverse effects of SNS on alcohol use. As an emerging area of research, digital parent-based interventions (PBIs) may be used to prevent adolescent risk behaviors related to alcohol and SNS. To ensure the efficacy of these interventions, parent and adolescent feedback is essential to optimize user engagement and acceptability. The current investigation aimed to gather parent and teen perspectives on usability and acceptability of a prototype digital PBI, developed in part based on previous focus group findings, for adolescent alcohol use and SNS use. Methods: A total of 29 parents (female = 86.2%, avg. age = 44) and 27 teens (female = 55.6%, avg. age = 16) dyads were recruited from across Texas. Parents and teens attended groups separately and were presented with prototype intervention content, including website modules and video content. Groups were asked to discuss initial reactions to and thoughts about usability (i.e., ease of navigation, layout and design, etc.) and acceptability (i.e., favorability of overall PBI, likelihood of using different features, etc.). Transcripts were reviewed to generate themes and trends in participant feedback across groups. Conclusions and Implications: Both parents and teens reported that dynamic module navigation features, which allow for tailoring of educational content to user interests, appeared highly usable. Participants generally agreed that a feature allowing parents to send video content directly to their teens from the PBI was an important aspect of the program, as it would provide an opportunity for both parents and teens to independently prepare for joint conversations and learning. Both parents and teens emphasized the importance of video narrator relatability including

delivery tone, age, gender, and diversity. Participants expressed desire for visually stimulating content based on user learning styles. Lastly, parents reported preferences toward fact-based and research-oriented content, whereas teens preferred intervention content with humor or shock value. Overall, feedback yielded important guidance for optimizing features to improve engagement and user learning. Findings are currently being integrated into the final digital PBI to be tested in an upcoming pilot study.
Burnout and Emotional Intelligence in Neurosurgical Advanced Practice Providers Across the United States: A Cross-Sectional Analysis

Abstract ID: UNTHSC16 Research Area: Other Presenter: Alexandra E. Richards Submission Type: Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

- Alexandra Richards
- Matthew Neal
- Kara Curley
- Nan Zhang
- Bernard Bendok
- Richard Zimmerman
- Naresh Patel
- Maziyar Kalani
- Mark Lyons

Abstract:

Purpose: Although much research has examined nursing and physician burnout, the advanced practice provider (APP) population has not yet been studied. The goal of the present study was to survey APPs in neurosurgery to determine whether greater emotional intelligence (EI) is protective against burnout. Methods: An 80-item survey was created that incorporated the Maslach Burnout Inventory Human Services Survey for Medical Personnel, the Trait Emotional Intelligence Questionnaire-short form, and original questions developed by us. The collective survey was distributed, administered, and collected using the webbased REDCap (Research Electronic Data Capture) platform. Statistical analyses were completed using a comparison between participants with and without burnout. Results: A total of 106 neurosurgical APPs (26 men, 80 women) completed the survey, of whom, 57 (54%) reported current burnout. High average scores for personal accomplishment and global EI were inversely related to burnout (P = 0.034 and P = 0.003, respectively). In addition, the following factors were associated with burnout: inadequate support staff in the work place (P = 0.008), inadequate time off work (P < 0.001), inadequate administrative time (P = 0.009), not experiencing support from one's supervisor (P = 0.017), insufficient time for continuing medical education (P < 0.001), an inability to separate work from personal time (P < 0.001), and an inability to advance within one's professional field (P =0.043). Conclusions: For neurosurgical APPs, EI is protective against burnout. Many opportunities exist at the individual and organizational level to alleviate burnout among

neurosurgical APPs. Targeted strategies to improve work-life balance, EI, support systems, and opportunities for career development among neurosurgical APPs might enhance employment satisfaction and reduce burnout.

An Unusual Presentation of Invasive Fungal Sinusitis in a Pediatric Patient with B-Cell Acute Lymphoblastic Leukemia

Abstract ID: UNTHSC13 Research Area: Pediatrics & Women's Health Presenter: Danielle Smith Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Danielle Smith
- Michelle Marcincuk
- Tyler Hamby

Abstract:

Background: It is widely known that patients with Acute Lymphoblastic Leukemia are extremely susceptible to soft tissue complications and infections due to their immunocompromised state. Invasive fungal diseases are important causes of morbidity and mortality among these pediatric oncohematological patients due to the angioinvasive nature and propensity to spread. It has been found that paranasal sinusitis at the initiation of chemotherapy affects the development of infectious complications of pediatric patients with cancer. Since invasive fungal sinusitis (IFS) is very aggressive disease that has a high mortality rate, early diagnosis and proper management is imperative. Case Information: Beginning December 2019, a 6-year-old female experienced intermittent, acute febrile episodes at least twice per week. The patient presented to the ED in May 2020 with fever, epistaxis, thrombocytopenia, and cervical and axillary lymphadenopathy. Her labs showed neutropenia with pancytopenia with circulating blasts. She was transported to Cook Children's Hospital where she was officially diagnosed with B-Cell Acute Lymphoblastic Leukemia. She was started on chemotherapy St. Jude Protocol Total XVII. The day before the patient was discharged, she had some mild erythema in the corner of her right eye near the bridge of her nose. CT scan showed mild sinusitis but no significant infection and was sent home with prophylactic medications. The patient returned to the ED the day after she was discharged and presented with fever, lethargy, and her eye had worsened with more significant edema and clear drainage. The patient was admitted again for IV antibiotics & observation. A few days later, the spot by her eye turned into black eschar, a sign of fungal infection. The patient was taken to the OR repeatedly over the next several weeks for biopsy and debridement. During this time, the chemotherapy regimen was discontinued and switched to Blinatumomab, and she reached remission within the first cycle. Conclusions: Fungal colonization of the paranasal sinuses is common, but this is not the sole factor for causing IFS. Ultimately, the host immune response is the cornerstone component in

determining the pathogenesis of sinusitis. Early diagnosis and treatment of IFS is associated with better outcomes and improved mortality rate. A recent study from March 2021 showed there was a higher incidence of IFS in adolescents who had sinusitis at the onset of chemotherapy. Therefore, sinusitis at the onset of chemotherapy should be recognized as a potential risk factor for IFS and demands that immunocompromised patients, particularly those with neutropenia, be continually monitored.

Implementation of Pediatric Mental Health Calls During the COVID-19 Pandemic and Postnatal Depression Findings Among Mothers

Abstract ID: UNTHSC12

Research Area: Pediatrics & Women's Health Presenter: Sarina Desai Submission Type: Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Sarina Desai
- Priya Bui
- Joanna Garcia

Abstract:

Purpose: During the COVID-19 pandemic, starting in March 2020 the University of North Texas Health Science Center (UNTHSC) Pediatrics Clinic had to limit in-person visits. With concern for the health of patients during this time, the Pediatric Mental Health Calls (PMHC) was created to provide support to patients at the UNTHSC Pediatrics Clinic and their caregivers. Methods: UNTHSC Pediatrics Clinic patient information was uploaded onto a database called REDcap. Medical and Physician Assistant (PA) student volunteers were trained to use call scripts to standardize phone conversations. An Edinburgh Postnatal Depression Scale (EPDS) was administered during calls to assess maternal mental health. Mothers with EPDS scores \hat{a} ‰¥ 12 were referred for risk of postnatal depression. Data collected from patients ranging from 2 to 6 months of age was analyzed and included demographic information and information about maternal mental health from the EPDS. Analysis used Chi-squared test of independence. Â Significance was set at p < 0.05. Results: The percentage of mothers with elevated EPDS scores was higher among Black or African American mothers compared to White mothers, showing a statistically significant relationship. Mothers who were working and had the father or a grandparent as the primary caretaker during the workday exhibited a higher percentage of elevated EPDS scores (42.86% father caretaker, 29.41% grandparent caretaker) compared to mothers not working (25.92%). Additionally, mothers with older infants had a higher percentage of elevated EPDS scores (5.08% at 2 months to 18.75% at 6 months). Conclusion: The PMHC program should be continued after the pandemic as an accessible and convenient means for maternal mental health evaluation and referral to resources. Future implementation should be modified to include mothers of infants of increased age ranges and culturally sensitive treatment models to improve racial disparities in postnatal depression.

In vitro and in vivo development of rifampin resistance with Staphylococcus aureus clinical isolates

Abstract ID: UNTHSC11 Research Area: Microbiology / Infectious Disease Presenter: Quentin Madunezim Submission Type: Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Chinonye Madunezim
- William Weiss

Abstract:

Purpose: Rifampin is an older antibiotic used to treat several types of bacterial infections including tuberculosis. It is highly active against Staphylococcus aureus and effective against infections with this pathogen. Rifampin is a unique antibiotic that has the capacity to penetrate through thick bacterial biofilms and reach bacteria that may be harder to treat using other antibiotics. Rifampin's mechanism of action involves inhibiting bacterial RNA Polymerase by forming a stable drug-enzyme complex, however mutations in the rpoB gene that encodes the beta subunit of RNA polymerase can cause resistance in S. aureus. Resistant S.Aureus can then form biofilms on implanted medical devices such as prosthetic hips or indwelling catheters, making it even harder to treat and difficult on the lives of these individuals. The focus of our research was to determine if mutations in the rpoB gene of S. aureus induced in vitro leads to a decrease in pathogenicity of the bacteria, can be duplicated in an animal model during treatment and if rifampin can still be effective against these resistant mutants. Methods: The minimum inhibitory concentration (MIC) of rifampin was determined for several isolates of S. aureus using a broth microdilution method. These susceptible strains of S. aureus were then serially passaged on agar plates containing rifampin at multiples of the MIC. Colonies were selected from plates with the higher rifampin concentration, saved and then passaged again at increasing concentrations of rifampin. The change in rifampin MIC was confirmed for each isolate and passage by broth microdilution. The same serial passage was then conducted in broth. To confirm the purity, isolates were cultured on MSA plates to determine if contamination was present. Results: MICs for rifampin against the S. aureus isolates tested increased from 0.008 $A\mu q/mL$ for the parent strain to 16 ŵg/mL for selected strain after 3 passages on agar. Similar results were obtained following serial passaging in broth with rifampin MICs going from 0.002 $\hat{A}\mu g/mL$ to $0.008 \text{ Å}\mu\text{g/mL}$. The observed increase in rifampin MIC for each isolate was found to be stable. Conclusion: Rifampin-resistant mutants were generated both in S. aureus 134-3 and 005-4 isolate strains following serial passages on agar plates and broth containing subinhibitory concentrations of rifampin. Rifampin MICs increased from parent to the resistant

generated mutants (0.002 ug/mL to 16 ug/mL). Future studies will include looking at the same parent strains in an animal model of biofilm infection and demonstrating development of resistance to rifampin during therapy.

Does polypharmacy education increase patient desire to reduce amount of prescription medications taken daily?

Abstract ID: UNTHSC10 Research Area: Aging / Alzheimer Presenter: Hope Patchen Submission Type: Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: Dual Degree Student

Author(s):

- Hope Patchen
- Erik Furman

Abstract:

Purpose: Increased awareness of polypharmacy and its inherent risks in the medical community has made the management of medications in the elderly an important aspect of primary care.1,2 Although the benefits of deprescribing are well understood, providers still encounter barriers to deprescribing including patient hesitance or fear of discontinuing medications.2,3 This project was designed to increase patient understanding of polypharmacy and its inherent risks, and to determine whether increased understanding affected the patient's desire to reduce the amount of prescription medications taken daily. The project was designed with the hope that patients would be more aware of the medications they use and more amenable to deprescribing interventions in the future. Methods: Patients presenting to an outpatient family practice clinic were administered an optional survey that gathered information regarding their personal medication use. This survey included an educational component designed to inform patients of polypharmacy and its inherent risks. Participants responses were recorded, given numeric values according to their level of understanding, and excluded if a participant's response was indeterminable. Participants' understanding of polypharmacy and its associated risks, as well as their desire to reduce daily prescriptions, was analyzed before and after completing the included educational material using a paired sample t-test in Microsoft Excel. Results: 30 patients agreed to complete the survey over a span of three weeks, 86 % of which were 65 or older. Although 80 % of patients surveyed were experiencing polypharmacy by its traditional definition, over 85 % of patients surveyed had never heard of polypharmacy or had low understanding of the term. The statistics showed a significant increase in the understanding of the term polypharmacy as well as its associated risks in participants, but no significant increase in the number of participants who desired to decrease the amount of prescriptions they take daily. 70 % of patients indicated that they planned to bring a list of their medications to their next appointment. Conclusions: This study suggests that many patients, even those experiencing polypharmacy, are not aware of its risks. Although educating patients about polypharmacy and its associated risks did increase understanding,

it did not significantly change patients' desires to reduce the amount of prescriptions taken daily. More than 50 percent of patients surveyed were already interested in reducing the amount of prescription medications they take daily prior to being educated about polypharmacy, possibly explaining the lack of significant change. Although overall understanding of polypharmacy did increase for this population, there were individuals who still rated their understanding as "low $\hat{a} \in \Box$. Gathering participant feedback regarding the educational material may offer insight into what was and was not effective. Additionally, increasing the sample size and engaging a more diverse population may provide greater insight to patient understanding and desires. NON-COMPETITION POSTERS

Patient Reported Outcomes: Why are we still using percentage change from baseline as an outcome?

Abstract ID: UNTHSC368 Research Area: General Public Health Presenter: Olagoke Sule Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

• Olagoke Sule

Abstract:

Patient-reported outcome (PRO) measures are generally used to examine the effect of medical interventions on how patients feel or functional status. When analyzing PRO endpoints, interpreting the change in scores between two-time points or the difference in change scores between treatment groups can be challenging. There is a lack of consensus in the research community regarding a frequently used endpoint 'change from baseline percentage.' This research discusses the advantages and disadvantages of using the anchor-based method in PRO studies. A case example is provided to illustrate concepts. Appropriate search parameters were identified to examine the topic, and PubMed was selected as the most relevant database. Published studies were retrieved between January 2000 and December 2021. Search terms included keywords: "ceanchor-based," "cepatient-reported outcome", "SF-36" and "cchange from baseline,"

. Articles were excluded if they did not include 'anchor-based' as a method. The information from the resulting articles was grouped into four categories: advantages, disadvantages, validity of the PRO method, and the PRO method's ability to detect change. The mismatch between the PRO instrument and the intended outcome is an important consideration in using percentage change from baseline as an outcome. This study provides an overview of key issues in assessing and documenting how patients feel or function.

Application of Geographic Information Systems to support Collaboration in Rural Osteopathic Medical Education and Community Health Initiatives

Abstract ID: UNTHSC354 Research Area: Health Disparities Presenter: Meron Tadesse Submission Type: Non-Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Meron Tadesse
- Leslie Allsopp
- Annette Smith
- Bobbie Bratton
- Teresa Wagner

Abstract:

Purpose: Geographic Information Systems (GIS) support collaboration in public health program planning, implementation, and evaluation, but there is an absence of models for the application of GIS to enhance collaboration between rural health and medical education initiatives. Rural communities experience entrenched health disparities as a result of poor access to healthcare and other barriers inherent to remote circumstances. Although varying across rural populations, urgent issues include shortages and poor retention in the primary care workforce; lack of resources for population-specific needs; and threats to financial sustainability for rural practices. Challenges are posed by the need to span diverse geographic regions, administrative systems, and professional backgrounds. Collaboration between medical education and community health initiatives offers an opportunity to maximize the impacts of scarce rural health resources. The Texas College of Osteopathic Medicine, (TCOM) Department of Family Medicine began implementing an articulated Rural Family Medicine Track program in 1996. This community-based curriculum prepares students for life and practice in rural and underserved communities; it includes real-world experience of living and working in rural Texas with faculty from all specialties, and providing free, mobile clinic services. SaferCare Texas is a department at the University of North Texas Health Science Center whose mission is to eliminate preventable harm through innovation. SaferCare Texas' community health initiatives including health literacy programs and community health worker (CHW) training to expand the rural workforce, improve access to preventative care services, engage citizens in care decisions, and promote healthy living; these, in

turn, may lead to the reduction of chronic illnesses, improved management and control of chronic conditions, and the early detection of treatable diseases. The purpose of this study is to explore the potential of Geographic Information Systems to enhance collaboration between existing Rural Family Medicine initiatives and the development and implementation of programs to increase CHW capacity in the Big Bend region of Texas, with a long-term goal of innovation and research to address rural health disparities. Methods: An interdisciplinary team has identified public datasets to advance collaboration. ESRI ArcGIS software is used as a mapping platform. Initial datasets include 1) Texas county boundaries obtained from Texas Department of Transportation (TxDOT) with the designation of hospital districts; 2) Texas census tract Social Vulnerability Index (SVI) which is comprised of 15 Social Determinants of Health and is developed by the Centers for Disease Control 3) location of Critical Access Hospitals and other clinical services, 4) Rural Family Practice preceptor and mobile, free clinic sites. Results: A preliminary map has been developed for use by project team members. Potential CHW sites and synergies to address unmet community health needs are being investigated. Identification of additional spatial data to support service coordination and collaboration is ongoing. Conclusions: Preliminary results indicate that data integration and visualization through GIS, may allow Rural Scholars and SaferCare Texas to more effectively engage rural health partners, develop a shared understanding of rural health issues, identify synergies to maximize the benefit of available resources, and provide a foundation for evaluation and research.

Adrenal Incidentaloma in a 72-year-old Male with History of Prior Exploratory Laparotomy

Abstract ID: UNTHSC341 Research Area: Cancer Presenter: Mackay Burgon Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

Mackay Burgon

Abstract:

Background: Adrenal incidentalomas are adrenal masses greater than 1 centimeter in diameter that have been found unexpectedly on radiographic imaging. Theses incidentalomas are found on 2.3% of abdominal radiographic images. The differential diagnosis of an adrenal mass is broad and includes adenoma, myelolipoma, cyst, lipoma, pheochromocytoma, adrenal cancer, metastatic cancer, hyperplasia, and tuberculosis. Case information: A 72-year-old Caucasian male presents for evaluation of a left adrenal mass that has increased in size over the past year. The mass was found on a CT scan showing a left adrenal mass with heterogenous enhancements with small low-density areas that could be cystic or necrotic. The patient did not present with any signs or symptoms. The patient has a history of hyperlipidemia, diabetes mellitus, hypertension, and is a hepatitis C carrier. He has allergies to penicillin, does not drink, and has a 10-pack year smoking history despite quitting 5 years ago. The patient's labs show elevated glucose at 137, elevated hemoglobin A1c at 5.8 and a decreased HDL at 37. All his other labs were within normal limits. He has a surgical history of exploratory laparotomy for a perforated gastric ulcer, appendectomy, and right finger amputation. A 24-hour urine study was done to measure the patients total metanephrines. His total metanephrine level was 305 mcg/24 hours which is in the normal range for the patient's age. Due to the increasing size a robotic left adrenalectomy was the treatment decided upon between the patient and physician. The increased risk of conversion to an open operation due to prior exploratory laparotomy was thoroughly discussed. Due to difficulty dissection, visual impediment, and proximity of the mass to the splenic artery and vein, the procedure is converted to an open surgery. The pathology report for the left adrenal mass reveals a 7 by 4.5 by 4 cm lesion positive for pheochromocytoma. The mass stains positive for chromogranin, synaptophysin and pancytokeratin while staining negative for GATA 3, inhibin and S100. The mass also shows a high potential for malignancy with 2+ periadrenal adipose tissue, 2+ necrosis, 2+ cellular spindling,

1+ capsular invasion, and 1+ vascular invasion. Conclusion: This patient and his case illustrate a distinct presentation of pheochromocytoma in an atypical age group, with no accompanying signs or symptoms.

Current Practices and Outcomes of Patella Fracture Fixation

Abstract ID: UNTHSC339 Research Area: Other Presenter: Mark Quiring Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Mark Quiring
- Addison Wood

Abstract:

Purpose Patella fractures account for approximately 1% of all fractures. Standard treatment includes nonoperative management, screw fixation, anterior tension band wiring, partial patellectomy, and plate osteosynthesis. The choice of surgical treatment is dependent on a multitude of factors, including fracture type, degree of displacement, age and expected activity, and more. Treatment of patella fractures with hardware can result in undesirable outcomes, including residual knee pain, stiffness, re-displacement or re-injury, and even hardware failure. Anterior plating of patellar fractures is a newer, promising treatment modality, reserved primarily for multifragmentation and severe displacement. This review aims to provide insight into outcomes and best practices regarding currently utilized surgical techniques for patella fractures. Methods A systematic search for articles was conducted in the PubMed database. Article types included were prospective cohort studies, retrospective reviews, and biomechanical studies, all from peer-reviewed journals. Studies conducted within the past decade (2012-2022) that analyzed fixation of various patella fracture patterns were included. Treatments of focus included standard screw fixation, tension band wiring, tension band wiring with augmentation, and various plating techniques. Fracture patterns ranged from simple transverse to complex comminuted patella fractures. Results Twenty-three studies (11 biomechanical, 8 prospective, and 4 retrospective) were included in the review, investigating a combined 394 individual patella fractures. The transverse patellar fracture was the most common fracture pattern treated and analyzed (10 articles) included in the review. Common outcomes analyzed included knee range of motion, activities of daily living, knee pain, and various standardized knee and patella scoring systems, such as the Modified Cincinnati knee rating system or the Kujala score. Conclusions Tension band wiring continues to remain a safe and proven technique for various fracture types of the patella. Plating constructs, as a newer

modality, show promising results when compared to other standard methods in patella fracture fixation, including superior clinical outcomes, lower non-union rates, and fewer complications. Limitations of some plating techniques include lack of long-term data, especially the newer models, and increased associated costs. Biomechanical comparison between various anterior plates is limited and warrants further investigation.

Mapping the distribution of immune cells in various mouse tissues

Abstract ID: UNTHSC336 Research Area: Immunology Presenter: Daniel Choi Park Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: TCOM DO Student (2nd Year)

Author(s):

• Daniel Park

Abstract:

The immune system is complex machinery where various interactions between immune cells via cell signaling, hormones, and chemokines lead to differentiation of the immune cell. With each interaction that causes immune cells to differentiate, the cellular properties will undergo modification where cells will express different cell surface markers, synthesize different proteins, gain, or lose a function, or start proliferation. By utilizing the changes in cell surface markers, it is possible to categorize immune cells and accurately identify the type of immune cells within a mice tissue which will be the focus of this project. The particular interest in this research is to identify M1 and M2 cells, and myeloid-derived suppressor cells. M1 (CD45+CD11b+F4/80+CD80+CD163-) cells are classically known as activated macrophages, and as a histiocyte, it phagocytoses pathogens and generates reactive oxygenated species. It is activated by pro-inflammatory cytokines such as IFN-y, TNF-a, or LPS, and it is activated by TH1. M2 (CD45+CD11b+F4/80+CD206+) cells are noted for their anti-inflammatory properties and promote tissue repair and wound healing. Myeloid-derived suppressor cells (MDSCs), on the other hand, are noted for their immunosuppressive effects. Mouse G-MDSCs (CD11b+Ly6G+Ly6Clo) suppresses immune responses in an antigenspecific manner via the production of reactive oxygenated species while mouse M-MDSCs (CD11b+Ly6Gâ[']Ly6Chi) suppresses immune responses in both antigen-specific and non-specific manners via synthesis of reactive oxygenated species. One of the hallmarks of MDSCs is that it is one of the cells that are found early in tumor progression. During the tumor formation, there is a notable increase in extramedullary hematopoiesis, neutrophilia, presence of abnormal myeloid cells which lack the membrane marks of known immune cells which are now identified as MDSCs. As this research will be a part of multi-part research, mapping the mouse immune cell tissue distribution will be utilized to build a foundation and set up an initial data for comparison for later when we start looking at mice with cancers and ones that are

treated with chemotherapy. This will help us to easily identify the recruitment/loss/differentiation of immune cells caused by any systemic changes.

Memorial Medical Clinic Fall Risk Assesment: Quality Improvement Project

Abstract ID: UNTHSC330 Research Area: Other Presenter: Victoria Ibarra-Aleman Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Victoria Ibarra-Aleman
- William Crowley

Abstract:

Purpose: For patients 65 and older, injuries sustained from falls can lead serious injuries and can cause a decrease in the elderly individual's quality of life. Therefore, screening for fall risks is important in the prevention of future falls and the consequences associated with those falls. Memorial Medical Clinic did not assess for fall risk in patients 65 or older; however, the clinic was now positioned to do fall risk screenings because they had the resources and the staff needed to perform this. This project looked at the correlation between increased fall risk assessments and increased screening of fall risk in the clinic. Methods: Data was gathered from November 9""30, 2021, using convenient sampling. Patients were screened with the "@Stay Independent""STEADI" guestionnaire. Patients were given the guestionnaire by the medical assistant on intake, and the patient filled out the survey while they waited for the provider to arrive. The average number of patients who were screened for fall risk and total number of patients who fit into the sampling population was evaluated. Results: With the implementation of the screening, using the STEADI guestionnaire, fall risk screening increased from 0% to 83.9% and 19 individuals with risk of falling were identified (4 or more points on the STEADI questionnaire). Throughout the study, only 1 person was excluded because they were deaf, mute, illiterate, and did not know sign language. Conclusions: Through the study, it was found that many of the elderly patients with risk of falling were already being seen at the clinic for the factors that placed them at risk. Additionally, with a system in place, the clinic was now positioned to continue performing fall risk screenings using the STEADI questionnaire. Throughout this quality improvement project, it was also identified that patient flow in the clinic needed to be improved to be more efficient in the handing out of the STEADI questionnaire. The need for more training in newly hired staff was also encountered. Both would be great areas for future guality improvement projects.

Impact of Education on Influenza Immunization Rates and Care Planning

Abstract ID: UNTHSC327 Research Area: General Public Health Presenter: Vincent Hua Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

• Vincent Hua

Abstract:

Influenza vaccination is the most effective way to prevent the flu and associated complications. Similarly, acute care planning in rural areas is more limited than in urban areas as clinics face significant barriers. By increasing education, clinics in rural populations can increase advance care planning and decrease complications of the flu. On a random day, patients will be asked if they have any future care plan and if they have gotten their flu shot. If they answered "œno" to either question, a pamphlet will be given educating the patient on the importance of the flu shot or future care planning. The subject will then be asked if they have changed their mind regarding their previous answer. Number of patients sampled was 21 (8 M, 13 F) with an age range of 30-92. Intervention resulted in 23.81% increase in patients who had a future care plan and a 19.05% increase in patients who got the flu shot. The short length of time as well as the small sample size make it difficult to measure exactly how big of an impact the intervention would make over a larger period or with a larger sample size. In addition, this study has a wide age range which could skew the data, as younger patients might not be as willing as older patients to think about future care planning. However, though flawed, the study shows the potential a small intervention could have on patient' health and well-being.

Branched-chain amino acids are neuroprotective against traumatic brain injury and enhance rate of recovery: prophylactic role for contact sports and emergent use

Abstract ID: UNTHSC324 Research Area: Rehabilitative Sciences Presenter: Ezek Mathew Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Ezek Mathew
- Julie Williamson
- Alia Mahama-Rodriguez
- Lois Mamo
- Rob Dickerman

Abstract:

Background: Branched-chain amino acids (BCAA) are known to be neurorestorative after traumatic brain injury (TBI). Despite clinically significant improvements in severe TBI patients given BCAA, the approach is largely an unrecognized option. Furthermore, TBI continues to be the most common cause of morbidity and mortality in adolescents and adults. In this study, we sought to demonstrate the neuroprotective and restorative effects of BCAA on the sequelae of TBI. No study has evaluated whether BCAA can be preventive or neuroprotective if taken before a TBI. We hypothesized that if BCAA were elevated in the circulation prior to TBI, the brain would readily access the BCAA and the severity of injury could be reduced. Methods: A standard weight-drop method was used on 50 adult mice to model a closed-head TBI in humans. The mice were randomized into groups that were shams, untreated, and pre-treated with BCAA, post-treated with BCAA, or pre-treated + post-treated with BCAA. Pretreated mice received BCAA through supplemented water and were dosed via oral gavage 45 mins prior to TBI induction. All mice underwent beam walking to assess motor recovery and Morris water maze assessed cognitive function post-injury. Results: Pre-treated and pre-treated + posttreated mice exhibited significantly better motor recovery and cognitive function than the other groups. The pre-treated + post-treated group performed the best overall while the post-treated group only improved in memory after day 7 of the study. Conclusion: This is the first study, animal or human, to demonstrate BCAA are neuroprotective and neurorestorative after TBI, most likely through the important roles of BCAA to glutamate homeostasis.

Association of Specificity Proteins with Hepatocellular Carcinoma Patients Survival

Abstract ID: UNTHSC319 Research Area: Cancer Presenter: Nwamaka Amy Iloani Submission Type: Non-Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (1st Year)

Author(s):

- Nwamaka Iloani
- Victoria Dulemba
- Areeba Hafeez
- Serena Bao
- Riyaz Basha

Abstract:

Presenter: Nwamaka Amy C. Iloani Authors: Nwamaka Iloani, Victoria Dulemba, Areeba Hafeez, Serena Bao and Riyaz Basha Title: Association of Specificity Proteins with Hepatocellular Carcinoma Patients Survival Background: Liver cancer is one of the most diagnosed cancers worldwide and ranks third in cancer mortality, leading to over 700,000 deaths per year. Of these liver cancers, the most common is hepatocellular carcinoma (HCC), accounting for nearly 80% of all liver cancer diagnoses. Since the current treatment options have limited improvement in prognosis over the years, identifying novel targets to induce therapeutic efficacy and reduce resistance to current therapeutic option is urgently needed. Specificity protein (Sp) transcription factors Sp1 and Sp3 are associated with incidences and poor prognosis of several cancers. Sp1 is implicated in the development and metastasis of HCC by binding to GC-rich sequences of the promoter region. Sp1 influences genetic transcription of the oncogenes encoding for the HCC by binding to gene regions such as RING1 and YY1 Binding Protein (RYBP), Ras guanine nucleotide-releasing protein 1 (RasGRP1) and many others to regulate their genetic expression. Sp3 works in a similar fashion and binds to GC and GT rich sequences in regulatory genes to affect HCC cell expression. The objective of this study is to ascertain the association of Sp1 and Sp3 expression with the survival of HCC patients using publicly available data bases. Method: Information regarding the expression levels of Sp1, Sp3, RYBP, RasGRP1 and Kaplain-Meier curves were obtained from accessing the data in the public data basses, R2 genomics visualization platform and The Cancer Genome Atlas (TCG). These data used to assess the probabilities of HCC patients with high vs low expression of Sp1 or Sp3. Results: The analysis of these

data indicated significant findings. When comparing normal liver cell lines and HCC cell lines, HCC cell lines showed increased expression of both Sp1 and Sp3. The high expression of Sp1 or Sp3 is associated with decreased probability and chance of survival in comparison to individuals with decreased expression (Sp1: p< 0.027; Sp3: p< 0.0087). The survival curves of RYBP and RasGRP1 also following similar patten, however the relevance to Sp1 and Sp3 has higher impact and poor prognosis. Conclusion: Higher expressions of Sp1 and Sp3 are typically associated with poorer patient survival rates. These results suggest that the therapeutic interventions that focus on targeting Sp1, Sp3 and their downstream mechanisms have the chance for impeding HCC tumorigenesis. We are investigating the association of Sp1 and Sp3 regulated oncogenes with HCC. Investigational agents with inhibitory effect against Sp1 and Sp3 are also currently being tested against HCC proliferation. Research reported in this publication was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number (R25HL125447). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

A Case Report of Situs Invertus Totalis and Polycystic Kidney Disease in a Newborn

Abstract ID: UNTHSC312 Research Area: Other Presenter: Jason McCullough Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (1st Year)

Author(s):

Jason McCullough

Abstract:

Background: Situs Inversus Totalis is a rare disorder in which the internal organs are reflected laterally. The prevalence of Situs Inversus Totalis is 1 in 10,000 live births. Children born with Situs Inversus Totalis can go on to live normal lives if no other conditions are present. Polycystic Kidney Disease (PKD) has multiple patterns of inheritance. PKD has been reported to follow autosomal dominant, autosomal recessive, and X-linked patterns of inheritance. Autosomal Recessive Polycystic Kidney Disease (ARPKD), which used to be called infantile PKD, has a prevalence of 1 in 20,000 individuals. ARPKD has a low life expectancy with 1 in 3 infants dying within the first month of life due to breathing problems, and 9 out of 10 infants who make it past the first month will die before the age of five. Situs Inversus Totalis and ARPKD are not directly linked, but both been associated to primary ciliary dyskinesia which could lead to both disorders occurring in the same infant. Case Information: A newborn child was diagnosed with Situs Inversus Totalis and ARPKD soon after being delivered. The mother was informed during the pregnancy that there was a risk of some abnormalities during prenatal screenings. Family history was not fully obtained due to the father of the child being a sperm donor. The newborn did not experience any symptoms from the Situs Inversus Totalis, but experienced problems associated with ARPKD, such as underdeveloped lungs. The newborn was monitored in the NICU to ensure symptoms could be treated appropriately. After symptoms had resolved, the mother and child were both discharged and returned home and told to follow routine newborn visits. There are currently no cures for ARKPD, but if the child becomes eligible, a kidney transplant could provide an improvement to the child's condition. Conclusion: Situs Inversus Totalis and ARPKD have been associated with primary ciliary dyskinesia but have not been shown to be directly linked together, but this association could provide insight into the condition of this patient. ARPKD is also linked to mutations in the PHKD1 gene but requires inheritance from both parents to be present. Since ARPKD is

found in the infant, it can be inferred that both parents would be carriers if this was the cause, instead of the primary ciliary dyskinesia. As previously mentioned, the father's medical history was not obtained. However, in other families, genetic testing can be conducted to determine risk of certain hereditary diseases such as ARPKD. In cases where genetic testing was not conducted, prenatal screenings can be used to determine if any abnormalities are present. Parents should be aware if certain disorders run in their family and should talk to their physician to see if genetic testing or prenatal screenings are necessary. Treatment options for ARPKD are still being explored but further research can develop solutions to increase life expectancy of newborns diagnosed with ARPKD. Cases like this are rare but could provide more information on causes of ARPKD and Situs Inversus Totalis leading to these new solutions.

Implications of COVID-19 On A Rapidly Growing Thymoma Case

Abstract ID: UNTHSC309 Research Area: Other Presenter: Neeraja Narayanan Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Neeraja Narayanan
- Shoaleh Motamedi
- Christain Lalaonde
- Mikko Tauriainen

Abstract:

Thymomas are a rare form of malignancy that most commonly present as an anterior mediastinal mass. These slow-growing neoplasms originate from thymic epithelial cells. Although most are asymptomatic, they can have a variety of presentations. Local compressive symptoms include shortness of breath, chest pain, cough, dyspnea, or orthopnea. Paraneoplastic syndromes, such as myasthenia gravis or pure red cell aplasia are seen in patients with thymomas due to abnormal T-cell maturation in the thymus, leading to an increased risk of autoimmune conditions. We report a case of a 71-year-old male with multiple comorbid conditions presenting to the emergency room after a mechanical fall that incidentally was found to have a 3.8 cm x 6.0 cm anterior mediastinal mass on chest computed tomography (CT). The patient did not initially present with any local compressive symptoms or paraneoplastic syndromes. Due to the Coronavirus disease-19 (COVID-19) pandemic, the patient did not follow through with his discharge recommendations for a surgical consultation. Over a year later, the patient presented to the hospital with chest pain, and repeat chest CT revealed that the mass had increased in size to 8.2 cm x 7.7 cm. A multidisciplinary approach was used to determine the patient's course of treatment. The patient then underwent median sternotomy, radical thymectomy, and mediastinal lymph node dissection. Following surgery, the patient became hypotensive and bradycardic during dialysis, despite surgical optimization and coordination with a multidisciplinary team. Ultimately the patient passed away from a cardiac arrest. It is imperative we consider the negative impacts that COVID-19 pandemic has had on this patient. The delay in treatment allowed the thymoma to multiply in size, resulting in a more extensive surgery. This in

turn led to unforeseen complications which resulted in the untimely death of the patient.

Health Advocates Addressing Vaccine Hesitancy in Minority Communities: A Program of the Texas Community Engagement Alliance (CEAL) of Fort Worth, Texas

Abstract ID: UNTHSC307 Research Area: Health Disparities Presenter: Helen Nguyen Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Helen Nguyen
- Gabrielle Scott
- Elizabeth Davis-Lydia
- Marcela Nava
- Bruce Bunnell
- Harlan Jones
- Bisola Dada

Abstract:

Racial and ethnic minority groups have experienced worse health outcomes related to the COVID-19 pandemic, including higher rates of infection, hospitalization and death when compared to White people. Community health outreach offers a tailored approach to delivering health information, taking into account the cultural differences among ethnic minority groups. While health profession schools often incorporate cultural competency training in the curriculum there is often little time for students to work with the community in a partnership. Through support provided by the Texas Community Engagement Alliance (CEAL) Against COVID-19 Disparities program, we recruited health profession students from the UNTHSC campus as community health advocates to provide a service learning experience. Students were provided a structured course providing contextual information on health disparities and participated in building a community project to increase COVID-19 vaccine uptake. Pending IRB approval, we will evaluate student's cultural competency and efficacy in participating as student health advocates. This research was, in part, funded by the National Institutes of Health (NIH) Agreement 10T2HL156812-01 as part of the NIH Community Engagement Alliance (CEAL)

Library synthesis of Slack potassium channel activators based on a high-throughput screening hit

Abstract ID: UNTHSC304 Research Area: Pharmaceutical Sciences Presenter: Dalena Nguyen Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Dalena Nguyen
- Alshaima'a Qunies
- Yu Du
- C. Weaver
- Kyle Emmitte

Abstract:

Introduction: Fragile X syndrome (FXS) is an X-linked disorder that is associated with cognitive disabilities. Previous studies have shown an association between a mutation in the FMR1 gene and FXS. The mutation is an overexpansion of the promoter region, resulting in hypermethylation and silencing of fragile X mental retardation protein 1 (FMRP).1 FMRRP is necessary for activating Slack proteins, which are important for normal neuronal activity.2, 3 Objective: To synthesize a library of small molecules in two distinct regions of an HTS hit chemotype made of sulfonamides and heteroaryl amines for functional testing versus Slack channels. Methods: Solution-phase and microwave-assisted organic chemistry were utilized to synthesis small molecules. Purification of compounds involved using automated liquid chromatography. Final compounds were characterized through NMR and HRMS data obtained from a Bruker Fourier 300HD and Agilent 6230 time-of-flight LC/MS, respectively. Activity of new compounds versus Slack was measured utilizing a Thallium flux assay in HEK293 cells stably expressing WT Slack channels. Results: SAR studies conducted around hit compound VU0521448 have thus far discovered analogs showing only weak activity against Slack proteins. Data for SAR studies developed around hit compound VU0521398 are in the process of being collected. Conclusion: The sulfonamide library prepared using different sulfonyl chloride substituents gave some analogs with weak activity in activating Slack proteins. Additional SAR studies will be carried out to examine other aspects of the chemotype, such as modifying the piperidine ring to pyrroline or pyrrolidine. FUNDING STATEMENT Research reported in this publication was supported by the National Heart, Lung, and Blood Institute (R25HL125447) and the

National Institute of Mental Health (R21MH125257), both of the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Health.

A Novel Approach for Stent Removal After Migration

Abstract ID: UNTHSC293 Research Area: Other Presenter: Shweta Sahu Submission Type: Non-Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (3rd Year)

Author(s):

- Shweta Sahu
- Jay Roberts

Abstract:

Background: Bariatric surgeries, including Roux-en-Y gastric bypass, sleeve gastrectomy, and biliopancreatic diversion with duodenal switch, are becoming increasingly prevalent in not only the US, but in the world as a whole. Though rare, complications after bariatric surgery can occur, with the most feared complication being gastric/ anastamotic leaks. One well known, safe and efficacious treatment of these leaks includes the placement of self-expandable metal stents (SEMS). Unfortunately, these SEMS have been known to move to a location other than where they were originally placed, a phenomenon known as "estent migration." Case Presentation: A 33-year-old Caucasian female with morbid obesity presented to clinic to pursue Rouxen-Y gastric bypass surgery after numerous failed attempts to lose weight. Though she was asymptomatic at the time, the patient elected to pursue the surgical weight loss management option after a trial of medical treatment for obesity, in which she was unable to maintain the weight loss for an extended period of time. This, in conjunction with her growing risk of medical comorbidities associated with her pre-existing morbid obesity, determined the management with laparoscopic Roux-en-Y gastric bypass, which proceeded with no complications during the time of surgery. Nine months later, the patient presented with dysphagia and epigastric pain, which prompted the need for esophagogastroduodenoscopy (EGD) which revealed erosive gastritis and a large marginal ulcer traversing the anastomosis. Though the patient tolerated robotic revision of the gastrojejunostomy (GJ) well, she developed another gastric perforation that required placement of a 12mm x 24 mm SEMS in order to close the leak at the GJ anastomosis. The patient presented to clinic with discomfort yet again, and this time, imaging revealed the stent had migrated distally, and was located just proximal to the jejunostomy. A typical endoscope (approximately 2.5 feet in length) is not sufficiently long enough to reach this area, and thus a unique 2 surgeon approach was taken to retrieve the migrated stent using a colonoscope, typically 5 feet in length. Conclusion: This case illustrates an innovative approach to removing a distally migrated stent, a

known complication of endoscopic stent placement in the management of gastric/ anastamotic leaks after bariatric surgery.

Investigational Agents to Target Specificity Protein1 Transcription Factor and Survivin for Inhibiting Medulloblastoma Cells Growth

Abstract ID: UNTHSC279 Research Area: Cancer Presenter: Serena Bao Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (2nd Year)

Author(s):

- Serena Bao
- Sachi Kishinchandani
- Briggs Lambring
- Riyaz Basha
- Umesh Sankpal
- Iloani Nwamaka

Abstract:

Abstract Presenter: Serena Bao Authors: Serena Bao, Sachi Kishinchandani, Briggs Lambring, Umesh Sankpal, Iloani Nwamaka, Riyaz Basha Title: Investigational Agents to Target Specificity Protein1 Transcription Factor and Survivin for Inhibiting Medulloblastoma Cells Growth Background: Medulloblastoma (MB) is a brain cancer predominantly arising in children. It accounts for 20% of all childhood brain tumors. The treatment for MB includes a combination of surgery and radiation therapy. Although around 70% of the patients have shown remission with treatment today, these therapies are associated with significant morbidity, especially in the youngest patients. Therefore, widespread interest is shown to develop more successful treatments. One potential target of cancer treatment is a protein known as survivin. Survivin inhibits cell death and is upregulated in most cancers, including MB. A transcription factor known as Sp1 upregulates survivin by binding to its promoter region. Therefore, suppressing Sp1 activities indirectly down-regulates survivin and can serve as a target for MB therapy. Our aim is to find and test appropriate investigational agents that inhibit Sp1, thereby inhibit survivin and cancer cell growth. In addition, we want to use an in silico analysis to determine the expression of Specificity protein1 (Sp1) and survivin in MB patients, and see how it correlates with the survival of these patients. It has been previously determined that the investigational agents Tolfenamic acid (TA) and its derivative copper-tolfenamic acid (CuTA) are effective at inhibiting Sp1 in some cancer cells. In this project, we investigated the growth inhibitory effect of TA

and CuTA using DAOY cell line. Method: DAOY cell lines (purchased from a commercial source, American Type Culture Collection, Manassas, Virginia; IBC-2016-0038) were cultured and seeded (2,000 cells per well) in a 96 well plate. Cells were treated using increasing concentrations (0, 10, 20, 40, 80 µM) of TA or Cu-TA. After a 48-hour incubation, the viability of the sample was measured via a luminance assay using the CellTiterGlo. Dose curves were generated, and the dose required to inhibit 50% of the viability (IC50 value) was determined using Graphpad Prism Software. Data from the R2 genomics visualization platform was used to generate Kaplain-Meier curves. The presented curves compare survival probabilities in Medulloblastoma patients with high vs. low expression of Sp1 and survivin. Results: The in silico analyses using R2 genomics visualization platform demonstrated MB patients who express higher levels of Sp1 is associated with low survival time(p = 0.033). Similarly, MB patients with higher levels of survivin expression show poor prognosis (p = 0.049) As per the IC50 values, Cu-TA is 3.6 times more effective against MB cells without affecting non-cancerous cells than TA Conclusion: Higher expression of Sp1 or survivin is associated with low survival time in medulloblastoma patients. Both TA and Cu-TA are inhibiting DAOY cell growth, however, Cu-Ta is more effective than TA against MB cell line. With increased resistance to standard therapies, TA and Cu-TA potentially enhance the therapeutic efficacy of chemotherapy and radiation.

Retrospective analysis of association of living in USDA classified food deserts with differences in mortality and disease status of cancer cases among patients identified in the Fort Worth Adolescent and Young Adult Oncology Coalition (FWAYAOC) Database

Abstract ID: UNTHSC273 Research Area: Cancer Presenter: Andi Winn Submission Type: Non-Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: GSBS Student

Author(s):

• Andi Winn

Abstract:

Purpose: Food deserts are low income and low access areas in which access to healthy food products is highly restricted or non-existent. They are most commonly found within low-income minority communities. Residency in such areas has been linked to several health conditions including obesity, diabetes, cardiovascular complications and even cancer. By analyzing the Fort Worth Adolescent and Young Adult Oncology Coalition (FWAYAOC) database for patient residency in food deserts, there is potential to find variations in disease status caused not only by differences in nutritional status, but also the socioeconomic factors affecting these areas. Methods: In this retrospective analysis, data from the FWAYAOC database was used to identify adolescent and young adult cancer patients treated at local Fort Worth hospitals in the years 2016-2020. Patient zip code at time of diagnosis was linked to food desert residency utilizing the USDA Food Access Research Atlas. Differences in mortality and disease status were compared by food desert residential status. Results: Among 1035 adolescent and young adult cancer patients identified, 40.40% resided in food deserts. Survival rates for food desert residents was 94.5% compared with 95.0% for non-desert residents, and mortality rates were 5.5 deaths per 100 patients and 5.0 deaths per 100 patients respectively. Food desert residency was associated with higher tobacco use, poor insurance coverage, and higher proportions of minority and Hispanic individuals. Females represented the majority population of each group, and the average patient age was 30 years for both. Food desert residents represented a higher diagnostic proportion for malignant neoplasms of digestive organs, respiratory and intrathoracic organs, bone and articular cartilage, bone marrow, female and male genital organs,
urinary tract, central nervous system, and endocrine glands. Conclusion: Survival and mortality rates were slightly worse for individuals living in food deserts. Poor nutritional status found within these areas, along with contributing socioeconomic factors, could be underlying factors leading to differences in disease prognosis between the two groups. Identifying such disparities affecting adolescent and young adult cancer patients can identify areas for future efforts to improve health and disease outcomes for this unique group of patients. Acknowledgement: This work is partially supported by a grant (#RP210046) from the Cancer Prevention and Research Institute of Texas (CPRIT). An Examination of the Importance of Electromyography (EMG) and Nerve Conduction Studies (NCS) Studies in the Evaluation of Persistent Paresthesia of the Hand Through Two Clinical Cases

Abstract ID: UNTHSC271 Research Area: Other Presenter: Amy Grice Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

- Amy Grice
- Brandon Pedersen

Abstract:

Background: Provocative clinical tests are often performed during the physical exam when patients present with paresthesia of one or both hands. Although Tinel's test is commonly done at the wrist and elbow for suspected neuropathy, studies have shown that this test does not have a high sensitivity or specificity. Electrodiagnostic testing can be used to accurately determine the cause of suspected neuropathy and provide useful information not provided by provocative testing. Case Information: The first patient was a 90-year-old male who presented with a six month history of progressively worsening numbness and tingling in the right fourth and fifth digits. The second patient was a 52-year-old male who presented with persistent numbness and tingling in the fourth and fifth digits of the hands bilaterally. On physical exam, Tinel's test was performed at the wrists and elbows with both patients testing negative bilaterally for both. Nerve conduction studies revealed that the 90 year-old patient had a significant drop in conduction velocity across the elbow for the right ulnar nerve. For the 52 yearold male, nerve conduction studies showed prolonged latency and diminished amplitude of the left ulnar sensory nerve across the wrist. Conclusions: Despite both patients having similar presentations, electrodiagnostic testing showed that the cause of their symptoms was different. Consistent with the recent literature, our negative Tinel's test and positive NCS findings in two cases of patients with ulnar neuropathy further support that physicians cannot rely on special tests alone to pinpoint the location or clarify the cause of symptoms consistent with neuropathy. Additional testing is needed, particularly in the form of EMG and NCS studies, to further elucidate the cause of the pathology to better direct care and find the patient proper treatment to restore function.

Imputation Accuracy of Apolipoprotein E $\hat{I}\mu$ Alleles in Genome-wide arrays and real-time SNP Genotyping

assays

Abstract ID: UNTHSC268 Research Area: Aging / Alzheimer Presenter: Kumudu Subasinghe Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Faculty / Staff (Not for Competition)

Author(s):

- Kumudu Subasinghe
- Isabelle Garlotte
- Sid O'Bryant
- Robert Barber
- Nicole Phillips

Abstract:

Purpose: The vast majority of the established genetic-based risk for late-onset Alzheimer's disease (AD) is attributable to variation within the apolipoprotein E (APOE) gene. This gene, which encodes a protein implicated in various aspects of AD pathology, is characterized by two single nucleotide polymorphisms (SNPs; rs429358 and rs7412) that result in three distinct isoforms ($\hat{I}\mu 4$, $\hat{I}\mu 3$ and $\hat{I}\mu 2$). Most populationbased genome-wide association studies to date have identified the APOE $\hat{I}\mu$ 4 and $\hat{I}\mu$ 2 alleles as the strongest genetic-based risk and protective factors for AD, respectively. APOE genotype is not only critical for determining disease risk and diagnosis, but also for developing individualized therapeutic strategies. Genotyping via real-time quantitative PCR (qPCR) is the gold standard for APOE isoform determination; however, if genome wide SNP data is available, imputation of APOE (i.e., probabilistic genotyping through inference) may eliminate the need for qPCR genotyping. In this project, we evaluate the concordance of APOE genotypes obtained via gPCR and a genome-wide SNP chip in non-Hispanic White and Mexican American individuals from the Health & Aging Brain among Latino Elders (HABLE) cohort. Method: DNA was extracted from buffy coat samples (n = 1650) on the Hamilton robotic system with the Mag-Bind Blood & Tissue DNA HDQ 96 Kit. qPCR was then performed using the TaqMan Genotyping Kit as per manufacturer's protocol. Results produced via qPCR were then compared to those imputed for rs429358 and directly typed for rs7412 on the Illumina Infinium Global Screening Arrays (GSA) and analyzed with Genome Studio 2.0. Samples with call rates less than 98% were repeated or excluded. Results: Concordance between the

APOE genotypes obtained from qPCR and Infinium GSA was 99.32%. Discordance was likely due to poor sample quality and low-frequency imputation errors of rs429358, which may be corrected with more conservative thresholding of the imputed genotype confidence statistics. Conclusion: Genotype imputation from SNPs commonly typed in the APOE region is an effective method for APOE isoform determination, even in Mexican Americans who are more genetically heterogenous due to ancestral admixture; this method may be effectively implemented in large population-based studies of aging and AD.

Asthma411: Integrating Evidence Based Medicine and Rapid Review Methodology into a School Health Collaboration

Abstract ID: UNTHSC254 Research Area: Pediatrics & Women's Health Presenter: Joshua Rogers Submission Type: Non-Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Joshua Rogers
- Jaimee Nguyen
- Tracy Chamblee
- Leslie Allsopp

Abstract:

Purpose: Asthma411 is a school program that provides resources and asthma education to families and school nurses in Tarrant County. Asthma411 includes the provision of stock albuterol in schools to aid students experiencing acute asthma exacerbations. For decades, accepted practice for the management of mild-intermittent asthma was largely based on short-acting beta-2 agonists (SABA), primarily albuterol. This changed in 2019 when recommendations from the Global Initiative for Asthma (GINA) no longer supported the use of SABA-only treatment. In 2020, the National Institute of Health Expert Panel Report 4 (EPR-4) also scaled back recommendations for SABA monotherapy. Additionally, there was concern that COVID-19 might be spread by the nebulizers previously used for the administration of albuterol at school. Instead, metered-dose inhalers (MDIs) with spacers were recommended, which also required the use of a common canister (shared MDI) and disposable spacer. The objective for this project was to review the best available evidence to answer three questions: (Q1) Is the provision of short-acting beta-2 agonists (SABA), through standing delegation orders, a best practice given the most recent guidelines from the EPR-4 and GINA (Q2) Does the evidence suggest there may be instances that a nebulizer should be available in addition to an MDI and spacer, to assure effective administration of medication? (Q3) Does sanitizing common canisters with alcohol pads in between users provide acceptable protection against the transmission of infectious agents in school settings? Methods: We conducted a rapid, systematic review using 3 major databases: PubMed, SCOPUS, and CINAHL. Search terms, inclusion, and exclusion criteria were developed and applied for each question. We also conducted an expanded search of national

recommendations, from the National Heart, Lung, and Blood Institute, American Academy of Allergy, Asthma, and Immunology, and the American Lung Association. Results: Our initial search yielded 381 articles. After removing duplicates and screening the articles, 31 unique and relevant articles remained. 15 of these articles were applicable to Q1. 21 articles were applicable to Q2, and 6 articles were applicable to Q3. Conclusion: For Q1) regarding the use of stock albuterol and the recent guideline changes, evidence supports the continued use of SABA in the school setting for isolated acute exacerbations as a best practice. For Q2) regarding MDI with a spacer vs. nebulizers, evidence supports the use of MDIs with a spacer as best practice. However, the spacers used in published studies differ substantially from those available for administration of SABA at school. The latter devices are disposable, collapsible chambers constructed of cardboard. A 2021 survey of Asthma411 school nurses indicated that some students had difficulty using disposable devices. Therefore, nebulizers may be considered in emergencies where disposable spacers cannot be effectively used by a student. For Q3) evidence supports the use of 70% isopropyl alcohol to sanitize a common canister used in a school setting. This application of evidence-based medicine and rapid-review methodology has informed Asthma 411 policies and exemplifies approaches to strengthen best practices in school health.

A sensitive LC-MS/MS method to quantitate nitrite in human plasma

Abstract ID: UNTHSC245 Research Area: Pharmaceutical Sciences Presenter: JIANMEI WANG Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Faculty / Staff (Not for Competition)

Author(s):

- Jianmei Wang
- Holden Hemingway
- Donna Coyle
- Steven Romero

Abstract:

Purpose: Numerous methods are available to quantitate nitrite in biological samples, including fluorescence, chemi-luminescence, capillary electrophoresis, colorimetric and ultraviolet (UV) spectrophotometry and gas chromatography-mass spectrometry (GC-MS). However, limitations associated with these techniques (e.g., lack of specificity, low sensitivity, etc.) prompted us to develop a LC-MS/MS method to quantitate nitrite in biological samples. Methods: We compared two derivatization methods which are used to convert the endogenous nitrite to a more stable organic compound that is able to be analyzed by LC-MS/MS. The first S-nitrosoglutathione (GSNO)-based method was performed by selected-reaction monitoring specific mass transition m/z 337 ([M+H]+)â⁺'m/z 307 ([M+Hâ⁺14NO]+"¢) for GS14NO and GS15NO as internal standard (IS) by reaction of nitrite and glutathione (GSH). The second 2,3naphthotriazole (NAT)-based method was performed by measuring NAT m/z 170 $([M+H]+)\hat{a}^{\dagger}m/z$ 115 ([C9H7+] and NAT-N15 as IS following the reaction of 2,3diaminonaphthalene (DAN) with nitrite to produce NAT. We found that the latter NATbased derivatization method is reproducible, stable, and 100 times more sensitive than the GSNO method. In addition, we validated the NAT-based method for precision and accuracy, recovery, stability and derivatization time and temperature. We then utilized the optimized method to quantitate nitrite in human plasma. Results: We found that nitrite stability in human plasma filtrate can be affected by freeze-thaw cycles and storage temperature which were evidenced by a decrease in nitrite levels over 50% after 24 hours at -20°C. However, the derivatized and extracted samples were stable for 24 hours at room temperature. When derivatization is fully complete and performed at 370C and 45 minute incubation, the recovery is 108%. The precision and accuracy

are 15%, and 106%, respectively. The linearity range is 0.13-16 ŵM with linear regression, 1/x weighing correlation coefficients = (r), R2>0.9990. The same amount of labeled isotope as IS was added to each sample to keep track of signal fluctuation between study samples, In doing so, it was confirmed that the quantitation of endogenous nitrite was indeed affected by individual complex sample content. And the use of isotope-labeled nitrite reduced the impact of high background levels of nitrite in biological matrices, which other methods cannot achieve. Conclusion: We have developed and validated a reproducible and highly sensitive LC-MS/MS method for quantitation of nitrite in biological samples. In addition, we anticipate that our method can be utilized in other fluidic human biological samples.

The impact of healthy pregnancy on maternal cognitive impairment in Sprague Dawley rats

Abstract ID: UNTHSC241 Research Area: Pediatrics & Women's Health Presenter: E. Nicole Wilson Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Faculty / Staff (Not for Competition)

Author(s):

- Elizabeth Wilson
- Jessica Bradshaw
- Selina Tucker
- Jennifer Gardner
- Styliani Goulopoulou
- Rebecca Cunningham

Abstract:

Introduction/Background: There is clinical evidence of impaired attention, learning, and memory in pregnant women during pregnancy and in the postpartum period, suggesting an association between pregnancy and maternal cognitive dysfunction. Yet, the effects of pregnancy on memory impairment are unclear. We hypothesized that pregnancy would induce maternal cognitive dysfunction that would persist postpartum in a rat model of healthy pregnancy. Methods: To observe recollective memory, the novel object recognition test was performed using Sprague Dawley female rats with different reproductive histories [non-pregnant virgin, late gestation (gestational day 20, term = 22-23 days), postpartum (28 days after birth), and parous non-pregnant (60 days after birth); n = 7-8/group]. Each rat was placed into an empty arena without objects, to allow for adjustments to the open arena. Thirty-minutes after habituation, each rat was given a period of five minutes to explore the arena with two objects of identical size, color, and texture. Upon completion, one hour was given before the animal was placed back in the arena. To test short term recollective memory, each rat was given three minutes to explore two items: one familiar item and a novel item of different size, color, and texture. The latency to which the animal made the initial contact for each object was recorded, and the number of contacts made with the novel object were tallied and compared with overall contacts to each object. Results: Pregnant rats had increased latency to initial contact of the novel object (p < 0.05) compared to virgin females, postpartum dams, and parous non-pregnant dams. Additionally, parous, non-pregnant dams displayed significantly greater contacts with

the novel object (p < 0.05) compared to pregnant rats and postpartum dams. Conclusion: Overall, healthy pregnancy results in decreased short term memory recognition that can be repaired over time. Future directions include evaluating the impact of healthy pregnancy on long term memory recognition, examining underlying mechanisms contributing to cerebral impairments during pregnancy, and determining the effects of pregnancy complications on memory impairment.

Health care provider recommendations for exercise in Mexican American elders with type two diabetes mellitus

Abstract ID: UNTHSC239 Research Area: Diabetes Presenter: Arlene Hernandez Submission Type: Non-Competition Poster Department: Institute for Translational Research Classification: Faculty / Staff (Not for Competition)

Author(s):

- Arlene Hernandez
- Maria Triana
- Shontia Robinson

Abstract:

Abstract: Purpose: Mexican Americans (MA) are more likely to have risk factors for developing Type Two Diabetes Mellitus (T2DM) than Non-Hispanic Whites. They are also reported to have some of the lowest levels of physical activity in the United States. Exercise lowers blood sugar levels and recommending specific exercises that are tailored to patients can become a more effective form of blood glucose control. This study aims to examine the relationship between healthcare provider recommendations on T2DM management for MA patients. Methods: The data was collected from 196 MA with T2DM from a community-based epidemiological study of aging. The healthcare provider recommendations were assessed using the Summary of Diabetes Self-Diabetes Care Activities Questionnaire (SDSCA). This questionnaire examines participant's diabetes and self-care. Descriptive statistics were used to describe what health care providers recommend for exercise. Results: The demographic characteristics were an age of T2DM onset (M=52, SD=10.2), fasting glucose (M=155, SD=62), average Hemoglobin A1C (M=7.99, SD 1.8). 87 percent of participants stated their providers recommended to maintain low levels of exercise. While 68.9 percent of participants endorsed that their health care team advised 20 minutes of daily exercise at least three times a week. 67.3 percent of participants said their providers recommended daily exercise. In contrast, only 31.1 percent were given specific instructions about the type, duration, and level of exercise. Conclusion: The study demonstrates that providers give general recommendations but not tailored ones about exercises to help manage participant's T2DM. The results show participants endorse low levels of exercise, but those levels are not enough. Findings support integrated recommendations from health care teams that reinforce specific information so patients can exercise enough to prevent the sequelae of diabetes.

Drink prices, drink specials, and tobacco policies in a national sample of on-premise drinking establishments

Abstract ID: UNTHSC238 Research Area: General Public Health Presenter: Cassidy LoParco Submission Type: Non-Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Cassidy Loparco
- Drew Walker
- Melvin Livingston
- Pamela Trangenstein
- Bita Khoshhal
- Kwynn Gonzalez-Pons
- Dennis Thombs
- Matthew Rossheim

Abstract:

Background: Bar and nightclub practices, such as offering inexpensive drinks, having pricing promotions (e.g., 2-for-1, happy hour), and permitting e-cigarette use indoors can increase the amount of alcohol that individuals consume and the number of negative consequences they experience. College students in particular may have a greater risk of increased consumption and related harms to themselves and others. Despite the implications, few studies have assessed the presence of low-cost alcohol and e-cigarette-friendly environments around colleges. The current study surveilled drink prices and specials and examined associated characteristics of on-premise drinking establishments near large universities. Methods: In 2018, telephone calls about prices, practices, and policies were made to 404 randomly selected bars and nightclubs within 2 miles of the largest residential universities in each U.S. state. The Alcohol Policy Information System provided data on state-level alcohol policies. Multivariable linear and logistic regression models examined associations between drinking establishment characteristics, drink prices, and drink specials. Results: The average price for a beer and a shot of vodka were \$3.62 and \$4.77, respectively. Most establishments (65%) had happy hour specials and 6% had 2-for-1 drink specials. Nearly all (91%) sold food, while 9% sold cigarettes on-premise and 8% allowed smoking inside. Almost 1 in 5 establishments (18%) allowed e-cigarette use inside. Allowing e-cigarette use indoors (b = -0.54) and selling cigarettes on-premise (b = -

0.79) were associated with significantly lower vodka prices, whereas allowing cigarette smoking inside (b = -0.46) was associated with significantly lower beer prices. Several factors were significantly associated with higher odds of having a happy hour special, including lower beer prices (OR = 1.38), selling food (OR = 2.97), no state law banning happy hour specials with full day price reductions permitted (OR = 12.74), and no complete bans on happy hour specials (OR = 4.24). Allowing e-cigarette use indoors was significantly associated with higher odds of having a 2-for-1 drink special (OR =6.38). Conclusions: The current study is one of the first to identify associations between business practices/policies of on-premise drinking establishments and drink prices. This study used a national sample of on-premise drinking locations near large universities to provide insight into how alcohol prices may be discounted to promote sales of other products. For example, locations selling cigarettes on-premise were associated with lower vodka prices. Importantly, previous research indicates positive associations between alcohol consumption and smoking. Coupled with the lowered drink prices, settings that are permissive of smoking and vaping may be associated with increased risk of both heavy drinking and tobacco use, as well as their related harms. Given the frequently offered drink specials and strong association between price and consumption, more research is needed regarding alcohol prices/specials at on-premise drinking sites.

Transverse Myelitis After Johnson & Johnson COVID Vaccine "" A Case Report

Abstract ID: UNTHSC230 Research Area: General Medicine Presenter: Ezek Mathew Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Ezek Mathew
- Julie Williamson
- Reign Johnson
- Lois Mamo
- Alia Mahama-Rodriguez
- Rob Dickerman

Abstract:

Introduction: As the novel coronavirus disease of 2019 (COVID) is an ongoing public health issue, many turn to vaccinations as a means of defense. While vaccination is generally safe, reports of rare pathologies subsequent to COVID vaccination exist, especially in the realm of neurological disorders. One such rare complication is tranverse myelitis, which will be the subject of this case report. Patients impacted by transverse myelitis may present with a varied neurological symptom, which may sometimes progress rapidly without treatment. These can include motor, sensory, and/or autonomic dysfunctions stemming from the spinal cord. These dysfunctions typically occur bilaterally at clearly defined sensory levels, and T2 weighted MRI will indicate cord hyperintensity. Case Description: A 56-year-old male patient presented to clinic with a chief complaint of episodic bilateral arm numbness. The patient tested positive for COVID in December of 2020, although recovery was uneventful. In May of 2021, the patient received the Johnson & Johnson COVID vaccine. The symptoms associated with his chief complaint developed approximately two months after receiving the vaccine. Two weeks preceding the patient visit, cervical Magnetic Resonance Imaging (MRI) was performed. Imaging evidenced severe cord edema from C1 to T1-2 with associated cord expansion. At C4-C5, there is a right sided disc protrusion causing moderate spinal stenosis with cord effacement. Additionally, the thecal sac measures 7mm at this level. At the C5-C6 and C6-C7 levels, there is evidence of moderate foraminal stenosis, bilaterally. Radiological evaluation confirmed these findings, while listing possible differentials of transverse myelitis, neuromyelitis optica, or a viral

myelitis. Along with recommendation for follow up and referral for contrast MRI, oral corticosteroid treatment was rapidly initiated. One week after treatment, another cervical MRI was performed. The radiology interpretation noted decreased extent of the abnormal enhancing signal within the cervical cord, compatible with resolving transverse myelitis. Over the time course of multiple weeks, symptoms improved. Discussion: While the majority of cases may yield abnormal strength and DTR, transverse myelitis presentations after COVID vaccination may ultimately vary widely, necessitating thorough evaluation. The prognosis of transverse myelitis is rather varied and depends on factors such as rate of symptom progression, quality of nerve conduction, possibility of spinal shock, and speed of treatment initiation. Prompt treatment and management of symptoms may allow for a successful recovery, as in this patient's case.

PROTEOMICS-BASED DISCOVERY OF PROTEIN NETWORKS AND ASSOCIATED BIOLOGICAL PROCESSES IMPACTED BY ESTROGEN IN THE MALE RAT RETINA.

Abstract ID: UNTHSC223 Research Area: Proteomics Presenter: Khadiza Zaman Submission Type: Non-Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: Postdoctoral Fellow

Author(s):

- Khadiza Zaman
- VIEN NGUYEN
- Daniel De La Cruz
- KATALIN PROKAI
- LASZLO PROKAI

Abstract:

Purpose: The retina is highly vulnerable to age-associated neurodegeneration critically affecting its nerve cells, which has prompted hitherto mostly futile searches to identify retinal neuroprotectants. Recent proteomics studies have revealed that estrogens elicit a variety of beneficial effects on retinal health in females. Here, we detail our proteomics studies showing the impact of $17\hat{I}^2$ -estradiol (E2) eye drops on male rat retina's with focus on affected protein networks and associated biological processes. Methods: Orchidectomized (ORX) Brown Norway rats received either 0.1% w/v E2 eye drops in saline/2-hydroxypropyl- \hat{I}^2 -cyclodextrin vehicle or the vehicle only once daily for three weeks. Proteins from target tissues were extracted and analyzed by mass spectrometry-based proteomics using label-free quantification (LFQ). MS/MS data were searched against the UniProt rat protein database by Mascot (Matrix Science). Validations and LFQ to detect statistically significant changes in protein abundances between groups were performed using Scaffold (Proteome Software). Mapping of the differentially expressed proteins to protein interaction networks and biological processes was done through Ingenuity Pathway Analysis® (Qiagen). Results: Our shotgun proteomics relying on LFQ covered 1761 protein, with 139 proteins differentially regulated. With identical treatment regimen and experimental methodology to collect data, the number of E2-regulated proteins in the male rat retina was less than half of what we found in the female rat retina. However, in terms of regulation, like our findings for females, the top network in the male retina was linked to development disorder, ophthalmic disease, organismal injury and abnormalities The top canonical

pathways associated with this network was protein ubiquitination and synaptogenesis signaling. Another strong aspect of protein interactions was the involvement of several upregulated isoforms of crystalline driving the top network. The abundant presence of crystallins has been found to promote the survival of retinal ganglion cells upon age-associated stress and traumatic insults, while their suppression is associated with retinal neurodegeneration. Conclusion: Our study captured E2's beneficial effects on the male rat retina linked to regulation of various neuroprotective pathways like estrogen-receptor signaling, synaptogenesis stimulating efficient protein disposal, and mitochondrial respiratory chain biogenesis to maintain retinal health. Targeted proteomics are in progress to validate a subset of E2-regulated proteins as robust target engagement markers for preclinical studies aimed at assisting the development of the hormone's retina-selective delivery to assure its therapeutic safety in males after topical treatment.

miRNA Profiling of Optic Nerve Head Astrocytes Exposed to Cyclic Stretch

Abstract ID: UNTHSC221 Research Area: Eye / Vision Presenter: Rajiv Rangan Submission Type: Non-Competition Poster Department: North Texas Eye Research Institute Classification: GSBS Student

Author(s):

- Rajiv Rangan
- Tara Tovar-Vidales

Abstract:

Introduction: Elevated intraocular pressure (IOP) is the primary risk factor for glaucoma, a leading cause of irreversible blindness consequent to retinal ganglion cell (RGC) degeneration. Elevated IOP induces biomechanical aberrations within ocular tissues "" including the transmission of biomechanical stretch through the lamina cribrosa (LC) region of the optic nerve head (ONH), the site where RGC axon damage first occurs. LC cells and ONH astrocytes (ONHA), the primary cells of the LC, respond to stretch in a manner that promotes pathological extracellular matrix (ECM) remodeling (fibrosis) and mechanical damage of RGCs within the ONH. A complex set of molecular mechanisms regulate ECM remodeling. Part of this regulation may involve microRNAs (miRNAs), small molecules that can inhibit protein expression by binding to and silencing mRNA. In this study, we examined miRNA expression profiles of ONHA exposed to cyclic stretch. We hypothesized that cyclic stretch would induce upregulation of miRNAs that silence anti-fibrotic protein translation and downregulation of miRNAs that silence pro-fibrotic protein translation, promoting a net-fibrotic molecular signaling environment. Methods: Primary human normal ONHA cell strains (n=3) were exposed to 0-12% cyclic stretch for 24 hours; controls were exposed to 0% stretch. RNA samples were collected from stretched and control cells, and miRNA PCR arrays were used to determine expression changes for miRNAs associated with fibrosis. Expression fold changes were normalized to SNORD68. The bioinformatics tool TargetScan was used to predict mRNA targets for any dysregulated miRNAs. Induction of fibrotic cellular changes by cyclic stretch was confirmed by western blotting of conditioned media for secreted proteins. Results: miR-146b-5p was found to be significantly upregulated by +5.97-fold (P = 0.029) in stretched ONHA. Predicted mRNA targets for miR-146b-5p are known to be involved in fibrosis and cell survival, among other functions. Preliminary data indicates upregulation of secreted proteins associated with fibrosis

(TGFÎ²2, Fibronectin, Transglutaminase 2) by stretched ONHA. Conclusions: Stretch modulates miRNA expression in cultured human ONHA, miR-146b may mediate ECM alterations and other pathological changes at the LC. Future experimental directions will include assessing co-expression of other miR-146 family miRNAs, validating putative mRNA targets and elucidating the mechanisms by which specific miRNA and their targets modulate ECM remodeling.

HIV-1 Nef-mediated acceleration of HPV-associated cancer through differential ubiquitination of cellular proteins

Abstract ID: UNTHSC220 Research Area: Cancer Presenter: IN-WOO PARK Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Faculty / Staff (Not for Competition)

Author(s):

• Inwoo Park

Abstract:

While the emergence of combination anti-retroviral therapy (cART) has reduced AIDSdefining cancer in individuals with HIV-1, the morbidity and mortality of non-AIDS defining cancers such as those caused by HPV remain high. However, the molecular mechanism by which coinfection of HIV-1 and HPV accelerates HPV-mediated cancer in coinfected individuals is unknown, as they infect distinct target cells using disparate receptor molecules. Our transduction experiment using pseudotyped HIV-1 indicates that HIV-1 cannot enter HeLa cells, human cervical cells, suggesting that viral protein generated by infected cells, not HIV-1 infection, may be responsible for accelerating HPV-associated cancer in coinfected individuals. Specifically, our study shows that HIV-1 Nef could be the major culprit. Proteomic analysis in the presence or absence of Nef indicated that ubiquitination was up-regulated in 93 cellular proteins and downregulated in 232, highlighting that Nef plays a key role in regulating cellular protein stability through ubiquitination and the UPS-mediated proteasomal degradation pathway. Western blot analysis demonstrated that differential ubiquitination was not caused by differential protein expression, validating our analyses. Computational analysis classified the majority of identified proteins as metabolite interconversion enzymes or nucleic acid metabolism proteins, with most being responsible for binding or catalytic activity, functioning in cellular and metabolic processes, and localizing to cellular anatomical entities and intracellular regions. Additionally, several proteins directly interact with Nef (23), the UPS (15), P53 (28), and E6, E6-BP, and E6-AP (1 each). Taken together, our data show that HIV-1 Nef plays a pivotal role in acceleration of HPV-mediated cancer progression in coinfectees.

A Case Report of Selective Skip Laminectomies and Subsequent Catheter Irrigation of a Holospinal Epidural Abscess

Abstract ID: UNTHSC215 Research Area: Other Presenter: Alexander R. Doederlein Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Alexander Doederlein
- George Beeton
- Zachary Loeffelholz
- Cezar Sandu

Abstract:

Background: Holospinal epidural abscesses (HEAs) are exceedingly rare, with less than 25 case reports of the condition found in the literature. Broad-spectrum antibiotics are virtually always indicated in its treatment upon its diagnosis, which is typically made via magnetic resonance imaging (MRI). Furthermore, if fulminant neurological deterioration presents, surgical debridement of the infection can help reduce the infectious burden and improve long-term outcomes. Access to the epidural space is attained via laminectomies; however, extensive laminectomies can destabilize the spine. Various case reports noted that selective laminectomies at particular vertebrae can avoid this destabilization, while still allowing catheter access to the length of the spinal cord. Case Information: Our patient was a 60-year-old male who presented with altered mental status, neck pain, and fever. He was diagnosed with methicillin-resistant Staphylococcus aureus meningitis and bacteremia. An MRI revealed an epidural abscess running from the cervical spine through the lumbar spine with concomitant compression of the spinal cord, as well as numerous paraspinal musculature abscesses and a retropharyngeal/prevertebral abscess. The patient was started on broad-spectrum IV antibiotics; however, his condition continued to deteriorate. The decision was made to perform a surgical debridement. Laminectomies were performed at vertebrae T4 and T10, and catheters were then run cranially and caudally through these points to access the length of the spinal canal. The purulent material was aspirated, and an antibiotic solution was then used to irrigate the epidural space; meanwhile, the patient was cycled between Trendelenburg and Reverse Trendelenburg positions to facilitate drainage of the purulent material. Following the procedure, the patient's neurological

status started to improve. He was kept on vancomycin postoperatively until his elevated inflammatory markers resolved. The patient recovered fully, and at three months follow-up had no neurological deficits. Conclusions: This surgical technique is an effective way to identify the inciting organism in a HEA, reduce the infectious burden, decompress the spinal cord, minimize surgical time and blood loss, and maintain stability of the spine without the use of instrumentation.

Renal TLR7 expression is associated with renal injury in female mouse model of systemic lupus erythematosus

Abstract ID: UNTHSC214 Research Area: Cardiovascular Presenter: Sarika Chaudhari Submission Type: Non-Competition Poster Department: GSBS: Physiology & Anatomy Classification: Faculty / Staff (Not for Competition)

Author(s):

- Sarika Chaudhari
- Bradley D'Souza
- Jessica Morales
- Caroline Shimoura
- Cassandra Young-Stubbs
- Rong Ma
- Keisa Mathis

Abstract:

Systemic lupus erythematosus (SLE) is an autoimmune disorder associated with exaggerated immune activation, autoantibody production, and immune complex formation. SLE patients are predominantly women of reproductive age that often present with end organ damage, specifically in the kidneys, and hypertension. This detrimental sequelae is likely due to deposition of the immune complexes and the resulting inflammation, but the exact mechanisms are unknown. It is known however that immune complexes activate toll like receptors (TLRs) on immune cells and TLR7 particularly is known to promote the pathogenesis of SLE. Therefore, we hypothesized that renal TLR7 impairs renal function and drives renal injury and hypertension in female SLE mice. Double-stranded DNA (dsDNA) autoantibodies, a hallmark of SLE, and albuminuria, a marker of renal injury, were monitored at 30 and 35 weeks of age in female and male SLE (NZBWF1) and control (NZW) mice. Glomerular filtration rate (GFR) was measured by sinistrin clearance and renal TLR7 and tumor necrosis factor $(TNF)-\hat{I}\pm$ expression were measured via Western blot to assess renal function and renal inflammation at the end of 35 weeks. Mean arterial pressure was measured in conscious mice at 35 weeks of age using indwelling arterial catheters. At 30 weeks, female SLE mice had elevated plasma dsDNA autoantibodies (U/ml) compared to female controls (4.6e5 \hat{A} ± 1.3e5 vs 8.9e4 \hat{A} ± 3.3e4; n=3-5; all p< 0.05), male SLE mice (6.3e4 \hat{A} ± 2.7e4), and male controls (4.8e4 \hat{A} ± 9.3e3). At 30 weeks, 32% (7 out of 22) of female SLE mice had albuminuria versus 5% (1 out of 22) of female controls,

5% (1 out of 20) of male SLE, and no male controls. At 35 weeks, 63% (10 out of 16) of female SLE mice had albuminuria versus 5% (1 out of 22) of female controls, 5% (1 out of 19) of male SLE, and no male controls. GFR (\hat{I} ¹/₄L/min/100 g body weight) was lower in female SLE mice compared to males at this same time point (865 \hat{A} ± 77 vs. 1066 \hat{A} ±60; p=0.029). Female SLE mice expressed a significantly higher renal cortical expression of TLR7 than both female control (p < 0.001) and male SLE mice (p < 0.001) 0.001). Renal cortical expression of TNF- \hat{I} ±, a downstream effector of TLR7, was increased in female SLE mice when compared to both female control mice (p < 0.001) and male SLE mice (p < 0.001). Both female and male SLE mice were hypertensive at 35 weeks: mean arterial pressure (mmHg) was higher in female SLE than female controls (152 \hat{A} ± 5 vs. 126 \hat{A} ± 3; n=6-8; p=0.003) and in male SLE compared to male controls (152 \hat{A} ± 4 vs. 136 \hat{A} ± 4 mmHq; n=6-11; p=0.041). These data indicate that increased expression of renal TLR7 and TNF- \hat{I} is associated with renal injury and hypertension in female SLE mice. These data also suggest a potential sex difference in the pathogenesis of SLE in males. Therapeutic strategies targeting the TLR7 molecular pathway should be further investigated in both female and male lupus nephritis.

Leading Predictors and Their Associations with Combination Pain Therapy in Older Adults with Cancer: Application of Machine Learning Approaches

Abstract ID: UNTHSC210 Research Area: Cancer Presenter: Sydney E. Manning Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: Faculty / Staff (Not for Competition)

Author(s):

- Christy Xavier
- Sydney Manning
- Suresh Madhavan
- Rafia Rasu
- Usha Sambamoorthi

Abstract:

OBJECTIVES: Opioid combination therapy is frequently prescribed in older adult cancer survivors despite negative outcomes. The objective of this study was to identify the leading predictors and their associations with opioid combination therapy prescribing after cancer diagnosis using interpretable machine learning approaches. METHODS: This is a retrospective longitudinal cohort of older (> 66 years old) cancer survivors (N = 2,673) diagnosed with primary and incident cancer in 2014 using the Surveillance, Epidemiology, and End Results (SEER) cancer registry linked with Medicare claims. Recursive feature elimination with random forest was used to extract the optimal number of predictors out of 119 likely ones for predictive modeling. eXtreme Gradient Boosting (XGBoost), SHapley Additive exPlanations (SHAP), and global feature importance were used to identify the leading predictors and their associations with opioid combination therapy. SAS 9.4 was used for data management and Python 3.9.7 was used for machine learning model calibration and tuning. RESULTS: Specificity (0.858), sensitivity (0.843), and area under the curve (AUC, 0.85) of our predictive model were high. Thirty-four features were included in the final predictive model. Baseline use of NSAIDs, opioids, benzodiazepines, and gabapentinoids, and chemotherapy, surgery, Complex relationships were observed between zip code percent of Hispanic and Native American residents living below poverty, care fragmentation (FCI), age at diagnosis, and opioid combination therapy. CONCLUSIONS: 1 in 3 older cancer survivors were prescribed opioid combination therapy. Patient-level baseline medication use, biological factors, cancer treatment, and zip code level social

determinants were leading predictors of opioid combination therapy. Although observed relationships were complex, further analysis of predictors may help compute individual risk of patients on combination therapy, which in turn may help clinicians and policy makers utilize targeted interventions at the outset and prevent long-term effects of combination pain therapy such as prolonged and inappropriate use.

Celiac Plexus Neurolysis: An Underutilized Palliative Therapy

Abstract ID: UNTHSC205 Research Area: Cancer Presenter: James Oh Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (4th Year)

Author(s):

- Hyuckjin Oh
- Scott Smith

Abstract:

Background: Celiac plexus neurolysis is an image-guided, therapeutic procedure wherein a neurolytic agent is injected into the celiac plexus resulting in permanent loss of the nerve plexus and subsequent pain reduction. Although it has been demonstrated to be safe and effective, celiac plexus neurolysis is an underutilized tool for pain management in the setting of palliative care. Case Information: A 40-year-old female was found to have an extensive, infiltrative gastric cancer with metastatic spread to the peritoneum and bones, as well as retroperitoneal invasion along the course of the celiac artery with invasion of the celiac plexus. Given her severe intractable abdominal pain requiring high opioid narcotic use, interventional radiology was consulted for celiac plexus neurolysis. The patient was a candidate for the procedure following a thorough evaluation of the patient with a multidisciplinary team and she consented after a discussion of the risks and benefits. Based on the current literature, a posterior paravertebral approach was deemed the most appropriate. Guided by computed tomography (CT), two 20-gauge Chiba needles were placed using a bilateral posterior paravertebral antecrural approach. Test injections were used to confirm needle position and satisfactory spread of the injection into the antecrural space. A 10 mL mixture of a 2 mL dilute contrast (1 mL Isovue-370 mixed in 20 mL normal saline) and 8 mL 1% lidocaine was made. The mixture was injected through both 5 mL Chiba needles. Ideally 25-30 mL of 95-100% ethanol is recommended, however due to a nationwide shortage of ethanol associated with the COVID-19 pandemic, 20 mL of 75% ethanol was injected instead through each needle. Post-procedure imaging confirmed dispersed spread of the neurolytic agent within the preaortic space. Conclusion: Following the procedure, the patient achieved temporary abdominal pain relief. However, her pain eventually returned to similar pre-procedure level. Factors that may have contributed to the ineffectiveness include her advanced disease status and tumor invasion into the celiac

plexus, multifactorial pain associated with metastatic disease, and the dilution of ethanol. In an ideal situation, percutaneous celiac plexus neurolysis has been shown to improve pain in 70-90% of patients with abdominal cancer with low complication rate, decrease the need for daily analgesic medications, and improve patient survival rate. Therefore, the shortcoming of our case study should not discourage physicians to consider the procedure for palliative care.

The Role of Osteopathic Cranial Manipulation in a 7-Year Old Male with Attention Deficit Hyperactivity Disorder

Abstract ID: UNTHSC203 Research Area: Physical Medicine / OMM Presenter: Mohammad Imran Rashik Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Mohammad Rashik
- Sajid Surve

Abstract:

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a disease process that involves mismanagement of the executive functions of the brain. Typical symptoms of ADHD may include aggression, attention loss with hyperactivity, anger, impulsivity, anxiety and even depression. ADHD is known to affect children with a prevalence of up to 9%, with symptoms being manifested in males more often than females. ADHD diminishes the quality of the lives of children and their families due to poor schoolwork and unacceptable social behavior. Osteopathic Cranial Manipulation (OCM) is a technique that can be used as a supplemental therapy for patients with ADHD. It has shown to provide significantly sustained improvements in attention and intellectual performance in pediatric patients. Case Presentation: A 7-year-old Caucasian male patient with a past medical history of strabismus and nocturia was presented to the Osteopathic Manipulative Medicine (OMM) clinic at the University of North Texas Health Science Center (UNTHSC) by his mother with the chief complaint of attention problems at home and school. The mother complained that the patient lacked attention at school, inappropriately touched his teachers at school, as well as friends and family members at home. The patient had trouble reading, writing and speech difficulties. For the academic term of 2020-2021, the patient had complaints of disruptive behavior from teachers every day. During late 2021, he also was officially diagnosed with ADHD. Over a period of 3 visits, osteopathic examination revealed restrictions in the right ethmoid bone, dural strain, sacroiliac joint restrictions, occipitomastoid suture restriction, right temporal bone external rotation and bladder restrictions in the pelvic area. The mother preferred medications to be a last resort of treatment. So, osteopathic cranial manipulative medicine (OCMM) was used with the intention of addressing underlying structural dysfunction. The treatments led to subjective relief of symptoms which led to increased attention span, better grades, acceptable social behavior and an overall

increase in quality of life in the patient. In order to assess treatment outcomes objectively, the Vanderbilt Assessment Scale was used over a period of three months. The post treatment symptom score from the mother decreased by 8 points in comparison to pre-treatment symptom score and the cognitive performance score decreased by 1.28 points. However, post treatment symptom score from the teacher increased by 1 point compared to pre-treatment and the cognitive performance score stayed the same. Conclusion: This case sheds light to the potential use of OCMM as a stand-alone therapy for patients who refuse to use stimulant medications and may be of use for osteopathic physicians in an outpatient setting. Due to conflicted scoring on the assessment scale from the mother and the teacher, it is difficult to conclude whether OCMM was of significant benefit to this patient. Therefore, a better solution would be to conduct clinical trials with stand-alone OCMM and a bigger sample size and then calculating the assessment scale results over a longer period of time.

Effects of Diabetes and White Matter Hyperintensities on Cognition in Mexican Americans Based on APOE e4 Carrier Status: An HABS-HD Study

Abstract ID: UNTHSC186 Research Area: Aging / Alzheimer Presenter: Kevin Mai Submission Type: Non-Competition Poster Department: Institute for Translational Research Classification: TCOM DO Student (2nd Year)

Author(s):

- Kevin Mai
- Melissa Petersen
- James Hall
- Leigh Johnson
- Sid O'Bryant

Abstract:

Background: The U.S. Hispanic population is projected to grow tremendously and face considerable increases in age-related conditions such as Alzheimer's Disease (AD). This same population also experiences a higher frequency of cerebrovascular conditions and diabetic risk factors, both of which have independently been associated with cognitive decline. Previous research demonstrates the impact of Diabetes Mellitus (DM) and white matter hyperintensities (WMHs) on cognitive functioning within the Hispanic population; however, to date, no study has looked into the effects of genetic factors such as APOEe4 carrier status on the link between these medical conditions and cognition. Methods: Data were analyzed on Mexican American participants from a study of health disparities stratified by DM status (Yes/No) and WMH burden (Low/High): n = 696 APOE e4 noncarriers (n= 206 No DM/Low WMH, n= 73 Yes DM/Low WMH, n= 153 No DM/High WMH, n = 128 Yes DM/High WMH) and n = 157 APOE e4 carriers (n = 48 No DM/Low WMH, n= 17 Yes DM/Low WMH, n= 35 No DM/High WMH, n= 26 Yes DM/High WMH). All participants underwent cognitive testing and a medical exam. Neuropsychological test battery included Trail Making Test Part A and B, WMS-III Digit Span, Mini Mental Status Examination, Spanish and English Verbal Learning Test (Immediate and Delayed Recall), and Digit Symbol Substitution. Diagnosis of DM was categorized as "œYes/No" \Box through past medical history and HbA1c blood work > 6.5. WMH status was based on a median value of 0.816 to separate "@Low/High" burden. Genetic testing was completed for APOE e4 to determine carrier status. ANOVAs were conducted stratified by APOEe4 carrier status with medical condition group (Yes/No DM

and Low/High WMH) entered as the predictor variable and cognitive test scores as the outcome variable. Tukey post-hoc tests were performed. Results: For APOE e4 noncarriers, participants in the Yes DM/Low WMH, No DM/High WMH, and Yes DM/High WMH groups performed worse than the No DM/Low WMH group on measures of attention, executive functioning, and processing speed. Those in the No DM/High WMH and Yes DM/High WMH groups also performed worse than the No DM/Low WMH group on measures of learning and memory. Among APOE e4 carriers, participants in the Yes DM/High WMH group performed worse than the Low DM/Low WMH group on measures of executive functioning, processing speed, immediate and delayed memory. Also, those in the Yes DM/High WMH group performed worse than the Yes DM/ Low WMH group on measures of global cognition, processing speed and delayed memory. Those in the No DM/ High WMH group performed worse than the No DM/Low WMH group in both immediate and delayed memory. Discussion: In APOE e4 carriers and noncarriers, DM and WMH burden were differentially associated with decreased test performance across multiple cognitive domains. This study tests the combined effect of DM and WMH on cognition in the context of APOE carrier status for Mexican Americans with findings that support the presence of specific associations thereby further highlighting the necessity to explore health disparities.

Evaluating the effects of the COVID-19 pandemic on patient management of Type 2 Diabetes Mellitus

Abstract ID: UNTHSC183 Research Area: General Public Health Presenter: Shelby B E Wildish Submission Type: Non-Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

• Shelby Wildish

Abstract:

Background: On March 11, 2020, the WHO declared Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), as a global pandemic. As a consequence of the COVID-19 pandemic, many countries implemented " α lockdown" \Box or quarantining regulations, to help maintain the virus spread. These declarations resulted in extended periods at home for patients, which is known to have undesirable consequences of physical inactivity, weight gain and increased risks of many pathologies such as Type 2 Diabetes Mellitus (T2DM). Type 2 Diabetes Mellitus is the seventh leading cause of death in the United States, and is a known risk factor for severe outcomes in COVID-19 patients. Texas has an increased prevalence of T2DM as compared to the US, with racial minorities, elderly and undereducated patients being disproportionately impacted by the condition. Purpose: This paper aims to explore the effects of the COVID-19 pandemic on the management of T2DM in patients in underserved communities who utilize free clinics for longitudinal primary care. Focus: Specifically, we intend to compare patient's Hemoglobin A1C (HbA1c), Weight and Body Mass Index (BMI) pre- vs. post-COVID-19 pandemic to investigate whether the COVID-19 pandemic affected the patient's management of T2DM.

Rethinking the dose response and risk-benefit relation for health benefits of exercise

Abstract ID: UNTHSC178 Research Area: Other Presenter: Ryan Craig Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Ryan Craig
- Sorrel Paris
- Matthew Biggerstaff
- Harsh Thakkar
- Michael Smith

Abstract:

Purpose: The dose response relationship between exercise and all-cause mortality has been well documented. The current Health and Human Services (HHS) guidelines recommend 150 minutes of moderate intensity exercise per week. This presents a barrier to entry for many patients, as demonstrated by nearly half of all Americans not meeting the HHS guidelines for daily aerobic activity. Methods: Using data from cohort studies, randomized control trials, and case control studies, we evaluated health outcomes at exercise volumes lower than the current recommendations. We used the 2011 Compendium of Physical Activities to quantify the contributions of daily activities and exercises to achieve activity level recommendations. Results: Despite current guidelines suggesting a minimum amount of 150 minutes of moderate intensity exercise to achieve benefit, we found there was statistically significant benefit occurring at much lower volumes of exercise. The largest change in overall mortality is often seen when comparing groups of no or minimal amounts of exercise to those engaging in low amounts of activity. This low level of energy expenditure can often be achieved without engaging in classical "œexercise" regimens. Conclusion: The current exercise recommendations can challenge patients' time, resources, physical capability, and selfefficacy. While current guidelines emphasize 150 minutes of moderately intense activity per week, patients benefit from much lower weekly physical activity volumes. A reframing of what is considered exercise would allow patients to subjectively feel more confident in their ability to influence their health through movement. Patients can also be challenged by the specific recommendations of aerobic exercise. This may be remedied by guiding patients to consider daily, non-exercise modalities as sources of

weekly activity. Ultimately, assessing the risk-benefit relation to total exercise workload may provide a novel approach to determining optimal targets for exercise that provide the safest and most efficacious exercise regimen. Therefore, clinical discussions focused on prescribing exercise should begin with acknowledgement of normal daily activities that promote energy expenditure and encouraging patients to increase overall weekly movement.

Analysis of the Impact of an Insulin Savings Model Among Medicare Part D Beneficiaries and Plan Sponsors

Abstract ID: UNTHSC177 Research Area: Health Disparities Presenter: Alyza King Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: Resident (Not for Competition)

Author(s):

- Alyza King
- Michael Voloudakis
- Ahmed Guhad
- Alvah Stahlnecker
- Pamela Tabor
- Christy Xavier
- Rafia Rasu

Abstract:

Background: An estimated one in every three Medicare beneficiaries have diabetes, and over 3.3 million Medicare beneficiaries currently use at least one form of insulin. On average, insulin retail prices can range anywhere between \$90 to \$1300 per package. Additionally, Medicare beneficiaries may enter various coverage phases throughout a plan year, resulting in variable prices and in some cases, significantly higher copays on insulin from one month to the next. A higher patient copay during the coverage gap phase has been associated with reduced adherence, which can lead to disease progression and worse outcomes. In 2021, the Part D Senior Savings Model was introduced to offer a benefit design that includes predictable member copays during all the coverage phases. Methods: This study was designed as a retrospective analysis comparing post-implementation prescription claims from 2021 to pre-implementation claims from 2020. Inclusion criteria consisted of members enrolled in a Medicare Advantage Plan with a Senior Savings Model benefit design during 2021 and a pharmacy benefit manager aligned model insulin list. Exclusions consisted of members enrolled in a Medicare Prescription Drug Plan (PDP), a plan with a customized insulin drug list, and/or a member receiving Low Income Subsidy. The primary objective was to analyze changes in the number of model insulin utilizers among Medicare Part D beneficiaries and plan sponsors enrolled in the Senior Savings Model during the 2021 plan year. Secondary objectives were to evaluate other changes in model insulin utilization, including days supply and adherence. A financial analysis was also
performed looking at changes among model insulins in member copay, total net cost, and total gross cost. Descriptive statistics were used for all study variables. Categorical data, including changes in the number of model insulin utilizers, was analyzed using a chi-square test to identify a P-value with a significance threshold set at 0.05. Quantitative data was evaluated through an unequal variances t-test. Results: The Senior Savings Model was found to significantly reduce member copay amounts, but did not result in adverse utilization of model insulins. The number of members who were optimally adherent did not change, but there was a slight reduction seen in overall adherence. Conclusion: Our findings would suggest that the SSM can improve member experience by reducing member copays but may not significantly impact adherence metrics.

Effects of Fosfomycin-Resistant Mutants on Bacterial Growth and Efficacy

Abstract ID: UNTHSC173 Research Area: Microbiology / Infectious Disease Presenter: Olagoke Sule Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: HSC College of Pharmacy Student

Author(s):

- Olagoke Sule
- William Weiss

Abstract:

Introduction: Fosfomycin (FOS) is an antibiotic used in treating urinary tract infections (UTI) and cystitis (bladder infection) in women. The antibiotic, which is bactericidal, works by inhibiting the bacterial cell wall biogenesis by inactivating the enzyme UDP-Nacetylglucosamine-3-enolpyruvyltransferase, also known as MurA. However, several mechanisms of FOS resistance have been reported. The resistance mechanisms involve reduced uptake of FOS due to a defect in one of the two transporters caused by mutations in the structural gene. Objective: This study looked at the differences in virulence and efficacy in the murine UTI model with FOS-resistant mutants. Method: The study started with two FOS-susceptible strains (E. coli 045 and 167). Isolated colonies from each parent strain were inoculated into Tryptic Soy Broth (TSB) then incubated for 5 hours. Next, the broth culture was swabbed onto a TSA plate. A 200 ug FOS disc was placed on the agar surface and incubated. The following day, colonies were selected from inside or around the edge of the zone of inhibition surrounding the FOS disc. These colonies were inoculated into TSB and incubated. This process was repeated for three passages (E. coli 045{A, B, C} and 167{A, B, C}). Next, Mueller-Hinton agar was prepped and used to determine the FOS minimum inhibitory concentration (MIC) for each of the passages of the two strains. Finally, a growth curve in Mueller-Hinton broth was performed to determine the effect the passages had on the growth patterns over time at 0, 1, 2, 4, and 6 hrs. Results: Fosfomycin MICs increased from 8 ug/mL to 512ug/mL from the parent to the resistant generated mutants on the Mueller-Hinton agar. It showed consistency in FOS resistance from the parent to the resistant generated mutants. Growth curves exhibited comparable patterns for parent and resistant mutants. Conclusion: Fosfomycin-resistant mutants were generated both an E. coli 045 and 167 strain following serial passages on plates with a FOS disc. Using the Mueller-Hinton agar method, Fosfomycin MICs increased from parent to the

resistant generated mutants (8 ug/mL to 512ug/mL). These results indicate that strains with elevated MICs may still be successfully treatable with Fosfomycin. Future studies will include looking at the same strains in an animal model of UTI and determining if the mutation is stable and can be treated with FOS.

Impaired cardiovascular function in obese Ossabaw swine model of heart failure with preserved ejection fraction

Abstract ID: UNTHSC163 Research Area: Cardiovascular Presenter: Theodore Van Weber Submission Type: Non-Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Johnathan Tune
- Gregory Dick
- Theodore Weber
- Deitrich Gerlt
- Alex Bale
- Cooper Warne

Abstract:

Presenter: Ted Weber Authors: Ted Weber, OMS-II; Deitrich Gerlt, Alex Bale, Cooper Warne, Gregory Dick PhD, Johnathan Tune, PhD Title: Impaired cardiovascular function in obese Ossabaw swine model of heart failure with preserved ejection fraction Background: The lack of pre-clinical large animal models of heart failure with preserved ejection fraction (HFpEF) remains a growing, yet unmet obstacle to improving understanding of this complex condition. Objective: The goal of this study was to examine cardiovascular responses to acute reductions in blood pressure in lean-control vs. obese Ossabaw swine with HFpEF (obese HF). Heart failure was induced by chronic tachycardia at 180 beats/min for ~4 weeks. We tested the hypothesis that rapid ventricular pacing would augment left ventricular end diastolic pressure, impair cardiac contractile function, and diminish regional myocardial perfusion. Methods: Following completion of pacing protocol, swine were anesthetized and instrumented for continuous measurements of hemodynamic parameters, left ventricular pressure, volume, and coronary blood flow. After measurements were obtained under baseline conditions, blood was serially removed to lower blood pressure in ~10 mmHg increments down to a mean arterial pressure of \sim 40 mmHg. Arterial and coronary venous blood samples were obtained at rest and during each reduction in blood pressure. Results: Chronic tachycardia significantly increased left ventricular end diastolic pressure (P < 0.001) but did not affect ejection fraction (P = 0.79) in obese HF (n = 5) vs. lean-control (n = 7) swine. Hemorrhage reduced blood pressure from 106 $\hat{A} \pm 5 \text{ mmHg}$ to 40 $\hat{A} \pm 1 \text{ mmHg}$ vs. 102 $\hat{A} \pm 4 \text{ mmHg}$ to 41 $\hat{A} \pm 1 \text{ mmHg}$ in lean-control

and obese HF swine, respectively. Reductions in arterial pressure robustly increased heart rate from 73 ű 8 to 136 ű 19 beats/min in lean swine. In contrast, the reflexive heart rate response was significantly attenuated in obese HF, as evidenced by a 4-fold reduction in the slope of the relationship between heart rate and blood pressure in obese HF vs. lean-control swine (P < 0.01). These changes were associated with significant reductions in the relationship between cardiac index (cardiac output/body weight) and end diastolic volume (P < 0.01), while the ratio of subendocardial to subepicardial blood flow to the left ventricle remained consistent as blood pressure was diminished in lean-control and obese HF (P = 0.53). Conclusions: These findings support that chronic high-rate ventricular pacing of obese Ossabaw swine induces key phenotypic features of HFpEF, including elevated left ventricular end diastolic pressure with normal ejection fraction, chronotropic incompetence, and impaired ventricular contractility.

Pituitary Adenoma in a Cadaver: A Case Report

Abstract ID: UNTHSC160 Research Area: Cancer Presenter: Savannah Eren Submission Type: Non-Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Bryan Barrientos
- Savannah Eren
- Treasure Diokpa
- Kurt Chunda
- Maya Deplaza
- Cara Fisher

Abstract:

Background: Pituitary adenomas have a prevalence of 1 in 865 adults to 1 in 2688 adults. A study with the Swedish Cancer Registry found that in a 33-year period between 1958 and 1991, the incidence of pituitary adenoma went from 6 per million to 11 per million. These adenomas can be divided into microadenomas (< 10mm) and macroadenomas (>10mm) with half of the incidence being the former and the other half the latter. Pituitary adenomas can be further divided by immunohistochemistry and functional status. Functional status is determined by whether or not the adenoma has hormone activity. Non-functional adenomas are usually incidental findings through imaging studies or autopsies, and are asymptomatic or paucisymptomatic tumors known as incidentalomas. Less than one percent of incidental tumors found at autopsy are macroadenomas. Functional adenomas can present with a clinical syndrome based on the hormone they secrete. Both functional and non-functional pituitary adenomas may cause symptoms resulting from mass effects, including bitemporal hemianopia, headaches, hypopituitarism, and ophthalmoplegia. Case Information: During a routine cadaver dissection of an undernourished 82-year-old male, removal of the brain and subsequent hemisection of the skull revealed a pituitary adenoma in the area of the sella turcica. The following measurements were gathered with calipers. The measurements of strictly the pituitary adenoma were a width of 13.56 mm and a length (anterior to posterior) of 19.13 mm. The pituitary adenoma with the sella turcica from superior to inferior was 23.73 mm. The measurement of the pituitary gland itself in the sella turcica from anterior to posterior was 13.68 mm. The measurements indicated that the cadaver's pituitary adenoma can be classified as a macroadenoma. The donor had a history of dementia, with the cause of death being senile degeneration of the

brain. There was no evidence of surgical procedures, and no other medical conditions were noted. Conclusions: Non-functioning and functioning pituitary adenomas are linked to damaged eyesight, hormonal imbalances, and impaired cognitive function. Functioning adenomas may have a more severe impact on cognitive function overall, as there is an apparent connection to neuroendocrine function. Due to the limited medical history of the cadaver, there is uncertainty regarding the type of pituitary adenoma and the effects it may have had. Various surgical methods have been proven effective for the treatment of pituitary adenomas themselves, including single nostril transsphenoidal microscopic and endoscopic surgery. Procedures are known to generally improve hormonal imbalances and not aggravate cognition. While patients' cognitive functioning post-surgery is not extensively tracked, procedures appear to have minimal effectiveness in improving cognitive function for patients with functioning pituitary adenomas and are nonsignificant for patients with non-functioning adenomas. Research determining the specific mechanisms by which pituitary adenomas affect cognitive functioning could be useful for clinicians and surgeons to determine whether surgical procedures would be effective at improving patients' quality of life. In this aspect, clinical case studies help add to the understanding and future literature of conditions, making them extremely important in the advancement of medicine.

Hyposplenia

Abstract ID: UNTHSC137 Research Area: Structural Anatomy Presenter: Tyler Patterson Submission Type: Non-Competition Poster Department: Center for Anatomical Sciences Classification: TCOM DO Student (1st Year)

Author(s):

- Tyler Patterson
- Cynthia Ramirez
- Chanyang Park
- Tiffany Sabbaghi
- Kavita Patel
- Cara Fisher

Abstract:

Background: The spleen is the largest secondary lymphoid organ in the human body. It is an intraperitoneal organ, located in the left upper quadrant, posterior to the stomach and inferior to the diaphragm from the T8-T11 vertebral levels. The typical size of the spleen is 6 cm in width and 10 cm in length, with a depth length of 3 cm. Embryonically, it is derived from mesenchyme in the dorsal mesogastrium, and during fetal development in utero, the spleen transiently functions in the production of blood cells during fetal development. During adulthood, the spleen acts as a major repository for phagocytic cells, lymphocytes, and platelets, with a primary function of blood filtration. Hyposplenia is reduced size and function of the spleen. It is a condition that can complicate many diseases, such as sickle cell anemia, alcoholic liver disease, and many autoimmune disorders. Functional hyposplenia is characterized mostly by defective immune responses against pathogens. This cadaver case report presents the clinical condition of hyposplenia. Case Information: First-year medical students engage in anatomy courses in which routine cadaver dissections are performed. An abnormally small spleen was found in the upper abdominal cavity of a 66-year-old female. The donor presenting with the hyposplenia outlined in this case report passed from acute liver failure of uncertain etiology, chronic kidney disease, and peripheral artery disease. A typical spleen as compared to the cadaver's spleen indicated the cadaver's spleen was drastically reduced in size. The donor's spleen measured 2.72 cm in width and 4.38 cm in length, with a depth of 1.39 cm. Conclusions: In contrast to splenomegaly, the clinical determinant of a small spleen, hyposplenia, is unclear. However, there are potential causes for the spleen's size to decrease. Exposure to radiation, sickle cell disease, diabetes and chronic alcoholism are all hypotheses for this change in size.

Patients with a defect in Kupffer cell function in relation to alcoholism have a predisposition to hyposplenism. In this case, the donor had the pathologies of diabetes and liver disease. The cause of death of acute liver failure of uncertain etiology could have been linked to the consumption of alcoholic beverages and their effects on the liver, as well as the effect on the Kupffer cells in the spleen.

The epidemiology of obesity among U.S. adolescents and the association with adequate sleep

Abstract ID: UNTHSC136 Research Area: General Public Health Presenter: Jil Shah Submission Type: Non-Competition Poster Department: School of Public Health: Biostatistics & Epidemiology Classification: School of Public Health Student

Author(s):

- Jil Shah
- Erika Thompson

Abstract:

Purpose: Childhood obesity, a leading risk factor for chronic illnesses and deaths, is a major public health concern. Increasing evidence suggests that sleep deprivation has a negative impact on metabolism and results in increased fatigue and hunger. Short sleep duration is considered a potential risk for overweight/obesity in childhood and adolescence. This study aims to understand the descriptive epidemiology of childhood obesity in the U.S. and explore the association between sleep and obesity. Methods: The national Youth Risk Behavior Survey (YRBS), 2019 (n=13,677), which is a crosssectional survey among high school students grades 9 through 12 in the U.S., was used to assess the prevalence of obesity and correlates. Obesity was measured from selfreported height and weight, considering the participants' age and sex. Additional stratification by demographic variables (sex, race/ethnicity, grade, sexual orientation), and sleep duration was conducted, and these associations were analyzed using t-test results from the YRBS Analysis Tool with a 0.05 level of significance. Results: Sixteen percent of high-school students in the U.S. (2019) reported being obese and the trend is continually increasing from 2009 to 2019. Some populations were significantly more likely to be obese than others, namely, males as compared to females (p-value< 0.01), American Indian/Alaskan Native as compared to Asians (p-value=0.01), bisexuals as compared to heterosexuals (p-value< 0.01), and those who did not get 8 hours or more of sleep as compared to those who did get 8 hours or more of sleep (p-value=0.02). Conclusion: There is a health disparity in childhood obesity prevalence by sex, race/ethnicity, and sexual orientation. Inadequate sleep is a significant factor associated with obesity. Further research is warranted to establish causality between sleep and obesity. Understanding contributors to obesity among subpopulations of adolescents could contribute to targeted interventions focusing on vulnerable

populations, which could help lower the prevalence of childhood obesity, its persistence into adulthood, and comorbidities.

Demonstration of Ultrasound Competency for Hypertrophic Cardiac Abnormalities in Pediatric Patients

Abstract ID: UNTHSC134 Research Area: Education Presenter: Katy Wyszynski Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (2nd Year)

Author(s):

- Katy Wyszynski
- Louisa Weindruch
- Amogh Krishnagiri
- Tien Do
- Taylor Terlizzese
- Bethany Holley
- Dallen Broadbent
- Matthew Biggerstaff
- Damon Schranz

Abstract:

Objectives: Hypertrophic Cardiomyopathy (HCM) is an inherited disorder characterized by thickening of the left ventricular wall. In some cases, thickening of the interventricular septum against the motion of the mitral valve leads to impedance of the left ventricular outflow tract, also known as Hypertrophic Obstructive Cardiomyopathy (HOCM). This can result in sudden cardiac death. HOCM can be considered a "esilent killer" in children, especially young athletes, as its presence is often subclinical and likely goes undetected and underreported. Point of care ultrasound (POCUS) is an efficient imaging modality that can diagnose HOCM in the pediatric population. We propose that 2nd and 3rd year medical students, all of whom are novice ultrasound users, are able to correctly visualize and measure the interventricular septum in pediatric patients using hand-held portable probes. This is relevant because it highlights the potential for medical students to use POCUS as a screening tool for HOCM. Methods: To evaluate our hypothesis, a group of nine 2nd and 3rd year medical students were asked to perform cardiac ultrasounds on pediatric patients during a preparticipation school sports physical event. While the students had some experience using point of care ultrasound, all were still considered novice ultrasound users. Prior to the event, the students attended a brief cardiac ultrasound training session with faculty. Following the school physical event, the student's images were evaluated by

ultrasound-trained faculty members. Using a standardized rubric, the images were graded as either adequate or inadequate. No medical decisions were made during the process and the students were not diagnosing hypertrophic cardiomyopathy or any other heart defects. Results: While we are still in the data analysis phase of our project, preliminary results suggest that medical students are capable of visualizing the interventricular septum using hand-held portable ultrasounds. We aim to have all images evaluated by faculty within the next month. Conclusion: Overall, our project aims to show that medical students can effectively operate hand-held ultrasounds and identify the structures involved in hypertrophic cardiomyopathy. We hope to show that with minimal ultrasound training, both clinical and pre-clinical medical students can obtain cardiac ultrasound images. Our research further highlights the growing importance of point of care ultrasound and its future applications as a potential screening tool for HCM/HOCM during the physical exam.

Prenatal Providers Awareness of Information Sources Regarding Syphilis Screening Guidelines

Abstract ID: UNTHSC132 Research Area: Pediatrics & Women's Health Presenter: Kaeli Johnson Submission Type: Non-Competition Poster Department: School of Public Health: Health Behavior & Health Systems Classification: School of Public Health Student

Author(s):

- Kaeli Johnson
- Ashlyn Kinard
- Stacey Griner

Abstract:

Purpose: Syphilis infections during pregnancy are associated with miscarriage, stillbirth, birth defects, and infant death. Since 2012, rates of syphilis during pregnancy and congenital syphilis have been increasing, with many cases occurring among pregnant people who have accessed prenatal care but were not screened. State-level policies and national guidelines recommend the testing of all pregnant people for syphilis infections to prevent the numerous negative health outcomes, including stillbirth. However, providers receive screening guidelines from various sources, including their professional organizations, which culminates in varying recommendations. The purpose of this study was to evaluate provider awareness of and the information sources from which they receive prenatal syphilis screening guidelines. Methods: Prenatal providers (MD/DO; n=201) were recruited via Dynata, an online survey panel. We assessed awareness of professional organization screening guidelines (Does your professional organization have recommendations or guidelines about syphilis screening during pregnancy? Yes, no, I don't know), and where they received their screening guidelines (Where did you learn about the prenatal syphilis screening guidelines?). For those who reported their organizations did not currently have prenatal syphilis screening guidelines, we assessed where they would like to be notified of the guidelines if their organization did (If your professional organization did have policies or guidelines about prenatal syphilis screening, where would you want to learn about them?). Response options for the source of guideline information included twelve sources: colleagues within organization, colleagues outside of organization, conferences, continuing education, curriculum in training, practice bulletins, journal articles, professional organizations, residency programs, social media, websites, and another source, where providers were asked to list the source. Frequencies, descriptive statistics, and bivariate analyses were

conducted in SPSS. Results: The majority of prenatal providers were Doctors of Medicine (MDs, 96%), and most (65%) worked in a private practice setting. A large proportion of prenatal providers were aware of prenatal syphilis screening guidelines (87%), with most of them learning these guidelines through practice bulletins (23%), their professional organization (21%), residency programs (14%), and continuing education (10%). The prenatal providers who were unaware (13%) wanted to learn about guidelines from their professional organization (20%), continuing education (18%), practice bulletins (18%), or conferences (15%). Overall, prenatal providers wanted to learn of any changes within prenatal syphilis screening guidelines through practice bulletins (28%), their professional organizations (23%), and continuing education (14%). Conclusions: Professional organizations, practice bulletins, and continuing education were the preferred sources of information for those who were both aware and unaware of screening guidelines. These sources were also favored by prenatal providers wanting to learn of any changes in syphilis screening guidelines, suggesting that these dissemination sources are important for provider awareness but are not reaching the entirety of their target audience. Targeted dissemination strategies utilizing these information sources could help increase provider awareness. Future studies should develop guideline and policy dissemination strategies to inform providers of recommended prenatal screening practices. Widespread dissemination of these recommendations could improve prenatal syphilis screening practices and by proxy reduce prenatal syphilis rates.

"What About Mom? Teen: Usability of a Postpartum App for Teen Mothers"

Abstract ID: UNTHSC131 Research Area: Pediatrics & Women's Health Presenter: Cassidy Faught Submission Type: Non-Competition Poster Department: School of Health Professions: Lifestyle Health Sciences Classification: TCOM DO Student (3rd Year)

Author(s):

- Cassidy Faught
- Teresa Wagner
- Carol Howe

Abstract:

Purpose: Age serves as a strong indicator of a woman's risk for complication and death resulting from pregnancy. Most countries including the U.S., show a J-shaped pattern of maternal-mortality risk, with adolescents having a greater risk of maternal mortality than women in their twenties and early thirties (Restrepo-Mendez & Victora, 2014). Additionally, the United States is the only developed country in the world where postpartum death rates (within one year after giving birth) are rising. Within the last decade, the use of smart phones and computers to access medical information has increased. However, there remains a gap in research and availability of apps to deliver postpartum instruction to adolescent mothers. Given this lack in information, we hypothesized that the What About Mom? App can fill this gap for postpartum teens ages 16-19 years old. The purpose of this study was to examine the usability of an app displaying postpartum warning signs for new teen moms to identify a need for care for urgent/ emergent medical conditions. Methods: Participants were recruited via email lists and ads on social media of community partners serving new mothers in both English and Spanish. Participants completed a survey that assessed their perception of the What About Mom? Apps' quality and usability. This was measured using the User Version Mobility Assessment Rating Scale (uMARS). The survey also gathered demographic information from the participants and assessed e-health literacy. E-health literacy was determined using the eHeals assessment scale which is the most commonly used validated measure for e-health literacy Results: Data was cleaned and 159 credible responses were garnered. Compared with the standard scores in each of the uMARS domains: Engagement, Functionality, Aesthetics, Information, and Subjective Quality; the What About Mom? App had the lowest rating in Information (3.48) and highest rating in Aesthetics (3.68). Qualitative suggestions were made from

the participants to improve Information. The mean total score for eHEALs was 30.0 (range 8-40; SD 5.9). The highest score was for the item " ∞ I know how to use the health information I find on the Internet to help me," and the lowest score was for " ∞ I have the skills I need to evaluate the health resources I find on the Internet". Conclusion: Knowing that postpartum moms report searching online for health information, understanding the association between e-health literacy, use of technology, health information" seeking behavior, and ability to apply health information is an important step in creating e-health messages, programs, and interventions to prevent maternal morbidity and mortality in disparate areas and age groups. Apps including The What About Mom? App are promising interventions that can help increase healthcare engagement for not only moms above 20 years of age but also adolescent moms to help reduce age, racial and ethnic disparities in teen maternal morbidity and mortality.

Ectopic Parathyroid Adenoma: A Case Study

Abstract ID: UNTHSC127 Research Area: Pediatrics & Women's Health Presenter: Rudy Tijerina Submission Type: Non-Competition Poster Department: TCOM: Pediatrics & Women's Health Classification: TCOM DO Student (2nd Year)

Author(s):

- Rudy Tijerina
- Lawrence Swanson

Abstract:

Background: Primary hyperparathyroidism is rare in pediatrics, occurring in 1 in every 50,000 children. This case study presents an adolescent with biochemical evidence of primary hyperparathyroidism in the context of a normal neck ultrasound. Case Information: A 15-year-old male with a one-year history of recurrent nephrolithiasis presented for evaluation of hypercalcemia. His initial work-up was notable for elevated PTH, elevated 1,25(OH)2 vitamin D, and low 25OH vitamin D, yielding a diagnosis of primary hyperparathyroidism. However, a neck ultrasound showed no evidence of parathyroid gland abnormalities. He then underwent sestamibi-single photon emission computed tomography/computed tomography (SPECT/CT), which revealed an area of localized uptake in the anterior mediastinum near the aortic arch. He later underwent endoscopic removal of the lesion with no complications. The pathology specimen was consistent with a well circumscribed parathyroid adenoma. Repeat tests performed one month after surgery demonstrated biochemical resolution of the hyperparathyroidism. The patient's pre-surgery labs showed a serum Ca of 11.6 mg/dL (ref 8.9-9.4), an intact PTH of 141 pg/mL (ref 12-71), a 250HvitD of 17 ng/mL (ref 30-100), and a 1,25(OH)2vitD of 104 pg/mL (ref 19-83). The patient's post-surgery labs showed a serum Ca of 9.3, an intact PTH of 57, a 25OHvitD of 16, and a 1,25(OH)2vitD of 115. Conclusions: The patient's initial laboratory evaluation was consistent with primary hyperparathyroidism, but his neck ultrasound was negative. Because 5 to 26% of children with primary hyperparathyroidism have ectopic parathyroid adenomas, there is value in using broader imaging modalities. Data on the accuracy of various imaging modalities for the detection of ectopic parathyroid adenomas in the pediatric populations is limited. In adult populations, the sensitivity of 99mTechnetium sestamibi scintigraphy for ectopic parathyroid adenomas has ranged from 54% to 100%. Combining functional imaging with detailed anatomic imaging, as with SPECT/CT, aides pre-operative surgical planning and likely further improves diagnostic accuracy. The diagnosis of primary hyperparathyroidism is established by typical findings on blood and urine studies. A negative neck ultrasound does not rule out the presence of a parathyroid adenoma. Scintigraphy and computed tomography are valuable tools in the evaluation of unexplained primary hyperparathyroidism.

Diabetic Foot Health Education Quality Improvement Project

Abstract ID: UNTHSC125 Research Area: Education Presenter: Cassidy Miller Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

Cassidy Miller

Abstract:

Diabetic foot health is an important facet of overall health in diabetic patients. Diabetes can result in many different diseases and often patients require extensive education from physicians and other health care providers. The purpose of this project was to develop a standardized educational pamphlet on diabetic foot help to insure complete but efficient education in the hopes to increase the number of patients who receive education. For two weeks I surveyed the clinic and counted the number of diabetic patients present for an annual well visit or six month checkup who were diabetic and if they received foot education. Then after development of an education brochure to enhance patient education I repeated the process. From the pre-enhancement phase to the enhancement phase I saw an increase in the percent of diabetic patients that received diabetic foot health education during their visit. Many patients benefited from diabetic foot health education but the benefit was not further quantifiable in this setting, as patients were not tested on education understanding and retention. Moving forward I would consider using a measurement to determine effectiveness of education implementation to quantify the quality improvement provided by the project. Patient education has proven importance in diabetic patient health, and while a higher number of patients were educated with an outlined education program, the patient benefit cannot accurately be determined without assessing education efficacy.

GUYON'S CANAL SYNDROME AFTER CUBITAL TUNNEL RELEASE: A CASE REPORT

Abstract ID: UNTHSC122 Research Area: Physical Medicine / OMM Presenter: Tai Yasuda Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (3rd Year)

Author(s):

- Tai Yasuda
- Drew Ferguson
- Omar Selod

Abstract:

Background: Compression of the ulnar nerve typically occurs at the cubital tunnel and less commonly at Guyon's canal. The cubital tunnel is located between the olecranon and the medial epicondyle. A known risk factor for developing cubital tunnel syndrome is repetitive motions at the elbow, commonly found in tennis players and smokers. Guyon's canal is located at the medial wrist between the hook of hamate and pisiform. Compression at Guyon's canal is rare and most commonly occurs in cyclists. In this case, Guyon's canal compression was found after an ulnar nerve decompression and cubital tunnel syndrome in the contralateral extremity. Case Presentation: The patient is a 74-year-old female that presented to the physiatry clinic for bilateral weakness, numbness and tingling in the fourth and fifth fingers. Symptoms in the right hand began approximately eight years ago. She had a right ulnar nerve decompression with persistent numbness since then. Symptoms on the left hand began three months prior to presentation. Social history was significant for an 80-pack year smoking history. Physical exam revealed positive Formant's sign bilaterally and positive Tinel's sign at the right wrist, right elbow, and left wrist. Electrodiagnostic findings were consistent with left sided cubital tunnel syndrome and right sided compression at Guyon's canal. Conclusions: The use of EMG and NCS studies are helpful in diagnosing ulnar nerve lesions. However, if a cubital tunnel syndrome is found, a distal Guyon's canal compression may be masked. In this case, an undiagnosed Guyon's canal compression may have been hidden in the initial EMG study. Additionally, proximal compression of a nerve may contribute to the disruption neurofilament structure, resulting in the distal nerve to be more sensitive to compression. In patients with persistent symptoms of ulnar nerve compression after surgical cubital tunnel release, repeat EMG studies to screen for Guyon's canal compression should be considered.

Increased angiogenic differentiation of HUVECs treated with pre-conditioned media from Lipedema adipocytes in vitro

Abstract ID: UNTHSC118 Research Area: Cell & Molecular Biology Presenter: Sara Al-Ghadban Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Faculty / Staff (Not for Competition)

Author(s):

- Sara Al-Ghadban
- Samantha Walczak
- Bruce Bunnell

Abstract:

Purpose: Lipedema is a connective tissue disorder characterized by an increased number of dilated blood vessels (angiogenesis), fibrosis, inflammation and accumulation of interstitial fluid in the subcutaneous adipose tissue. This project aims to gain insights into the lipedema vasculature using human umbilical vein endothelial cells (HUVECs) as an in vitro model of angiogenesis. Methods: HUVECs were cultured in conditioned media (CM) collected from lipedema adipocytes differentiated in vitro. The effects on the expression of the endothelial and angiogenic markers [CD31, von Willebrand Factor (vWF), Angiopoietin 2 (Ang2), Hepatocyte Growth Factor (HGF), Vascular endothelial growth factor (VEGF), Matrix Metalloproteinase (MMPs)] in HUVECs, as well as tube formation, were investigated. Real-time polymerase chain reaction (RT-PCR), tube formation and Western blot assays were used to assess the expression of endothelial and angiogenic markers in HUVECs. In addition, the ability of HUVECs to form capillary-like tubular structures (tubes) when seeded on reconstituted basement membrane (Matrigel) was determined by phase-contrast microscopy and the number of tubes formed (number of nodes and branches) was quantified using NIH ImageJ software. Results: The expression of CD31 and Ang2 were increased at both the gene and protein levels, while vWF expression was significantly decreased in HUVECs treated with CM from lipedema adipocytes. In addition, the gene expression of HGF and MMP9 and the number of nodes and branches were increased in treated HUVECs. No changes in VEGF gene expression were detected. Conclusion: These results indicate that lipedema adipocyte-CM promotes the vascular tube formation of endothelial cells through paracrine mechanisms. The expression of multiple factors that stimulate the process of angiogenesis was upregulated after exposure to conditioned media from

lipedema adipocytes. Definition of the pathways that enhance angiogenesis in lipedema tissues will help researchers develop new therapeutic approaches to treat this disease.

Optimization of benzo[d]oxazol-2(3H)-one activators of Slack potassium channels

Abstract ID: UNTHSC114 Research Area: Neuroscience Presenter: Nigam Mishra Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmaceutical Sciences Classification: Faculty / Staff (Not for Competition)

Author(s):

- Nigam Mishra
- Yu Du
- Brittany Spitznagel
- C. Weaver
- Kyle Emmitte

Abstract:

Introduction: Fragile X syndrome (FXS) is an inherited genetic disorder that causes intellectual disability (ID) and other comorbid conditions, including cognitive disabilities, behavioral conditions, and autism spectrum disorder (ASD). FXS is caused by silencing of the FMR1 gene, which leads to an absence of the fragile X mental retardation protein 1 (FMRP). FMRP has multiple important functions and among these is activation of Slack potassium (K+) channels. Slack is a member of the Slo family of channels, which are critical regulators of electrical activity in the nervous system. Thus, dysregulation of Slack activity leads to abnormal neuronal activity. Preclinical studies have shown that Slack activity is critical for higher brain functions including cognitive flexibility, learning, and memory. Hence, selective activation of Slack by a small molecule may represent a viable approach to treating certain cognitive deficits in FXS and potentially other forms of ID. Objective: Currently there are no available selective small-molecule activators of Slack, so the objective of our work is to develop such tools to investigate them as a potential new therapeutic approach to FXS. Methods: Hit compound VU0609159 was identified via high-throughput screening (HTS) using thallium (TI+) flux assay in HEK-293 cells stably expressing Slack and confirmed in an automated electrophysiology assay. Library synthesis based, iterative hit optimization strategy around hit VU0609159 was employed. Classical and state-of-the-art synthetic chemistry techniques including microwave assisted organic synthesis and flow chemistry were employed for synthesis of target compounds. Purification was done by automated liquid chromatography. Bruker Fourier 300HD and Agilent 6230 time-of-flight LC/MS were utilized to obtain NMR and HRMS, respectively. Results: VU0609159 is a member of a

series of benzo[d]oxazol-2(3H)-ones and has multiple regions amenable to rapid Structure-activity relationship (SAR) development through the preparation of small libraries of compounds. During SAR study, we found cyclic and acyclic branched linkers optimal for the activity. Substitution of benzo[d]oxazol-2(3H)-one ring with benzo[d]thiazol-2(3H)-one gave encouraging results. Conclusion: SAR for multiple regions around Slack activity in the VU0609159 series has been identified utilizing this approach and our TI+ flux assay. Studies combining optimal functional groups within each region of the scaffold are ongoing.

Novel Kinase Inhibitors Library Screen Differentially Impacts Adipose Stem Cells (ASCs) from Lean and Obese Donors

Abstract ID: UNTHSC106 Research Area: Cell & Molecular Biology Presenter: Caroline Rinderle Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Faculty / Staff (Not for Competition)

Author(s):

• Caroline Rinderle

Abstract:

Purpose: Breast cancer is the second leading cause of death among women in the United States. Obesity increases the risk of developing breast cancer and ultimately leads to poorer outcomes. Obesity is defined as the excess accumulation of adipose tissue, evidenced by a BMI of 30 kg/mÂ² or greater. Adipose tissue consists primarily of adipocytes, but the stromal vascular fraction (SVF) consists of numerous other cell types as well, including adipose-derived stem cells (ASCs). ASCs are self-renewing, multipotent, mesenchymal stem cells that have been intensely studied for their role in regenerative medicine. Our lab has shown that ASCs extracted from obese patients are recruited to breast tumors more than ASCs extracted from lean patients. This made breast cancer outcomes worse in our xenograft models, indicating a connection between ASCs in obesity and breast cancer. These changes in cancer behavior may be due to the activity of important protein kinases. Kinases are essential to cellular function, activating necessary proteins to propagate signal cascades, without which survival would be impossible. Little is known about the 538 kinases encoded in the human genome, and therefore, they need to be researched more thoroughly. If the obese ASC-breast tumor crosstalk can be interrupted via prevention of specific kinase activity, then poor breast cancer outcomes may be prevented and novel therapeutics can be uncovered. Methods: Pools of ASCs from lean and obese donors were treated 100nM of KCGS Drug Library kinase inhibitors obtained from Dr. David Drewry at the SGC at UNC Chapel Hill. After 72 hours, cells were stained with crystal violet and imaged for cellular viability and morphologic changes. Results: Fifteen kinase inhibitor drugs affected ASCs from both lean and obese donors. Nine kinase inhibitor drugs affected ASCs from obese donors only. No kinase inhibitors affected ASCs from lean donors alone. Conclusions: Obesity changes the biology of ASCs in a way that can potentially be therapeutically targeted. In the future, testing the ability of ASCs to

differentiate into mature adipocytes after treatment with kinase inhibitors will give greater insight into the role specific kinases play in the biology of an obese patient. We will also study the roles of the kinase inhibitors and kinases in the biology of ASCs more thoroughly.

Quality Improvement Project: Deprescribing Statins in Patients Over 85 Years Old

Abstract ID: UNTHSC90 Research Area: Patient Safety Presenter: Ren Shirai Submission Type: Non-Competition Poster Department: TCOM: Internal Medicine & Geriatrics Classification: TCOM DO Student (3rd Year)

Author(s):

- Ren Shirai
- Ramon Cantu
- Lesca Hadley
- John Gibson

Abstract:

Purpose: Recent studies have suggested that elderly patients over 85 years old do not benefit from statin therapy and may be more susceptible to adverse effects, including a higher mortality rate. The purpose of this project is to deprescribe statins in patients over 85 years old at a family medicine practice in Eagle Lake, TX. Methods: A chart review of patients over 85 years old encountered between September 2021 and October 2021 was conducted. Those on statin therapy was identified. Enhancement was subsequently implemented between October 2021 and November 2021, which involved identifying those who are over 85 years old on statin therapy and recommending them to discontinue it. Results: The pre-enhancement chart review of patients seen between September 2021 and October 2021 found 5 out of 7 patients who are over 85 years old were prescribed statins. 1 out of 2 patients over 85 years old seen during the enhancement period between October 2021 and November 2021 were on statin, which was subsequently deprescribed followed by patient education and counseling. Conclusions: Though we were only able to deprescribe statin on one elderly patient, our pre-enhancement chart review suggests there are more who may benefit from this enhancement. We have learned the importance of being up to date with the latest therapy guidelines. The next steps are to continue implementing this enhancement and educating patients and other family medicine providers within the practice.

Index Pollicization with Subsequent Development of Scaphoid AVN

Abstract ID: UNTHSC84 Research Area: General Medicine Presenter: Alexander Frangenberg Submission Type: Non-Competition Poster Department: Other Classification: TCOM DO Student (2nd Year)

Author(s):

- Alexander Frangenberg
- William Pientka
- William Pipkin

Abstract:

Background: Preiser's disease, or idiopathic scaphoid avascular necrosis (AVN), is a rare ischemic event of the scaphoid occurring in patients with no prior history of wrist injury. Blood flow to the scaphoid originates distally from the radial artery and proximally; thus, many cases of Presier's disease present with proximal pole ischemia. Holt Oram syndrome is an autosomal dominant disease that presents with cardiac and upper appendicular skeletal deformities, namely of carpal and thenar origin. Carpal malformations include scaphoid hypoplasia and bipartite ossification, retention of the os centrale in utero, and the addition of extra carpal bones or other carpal anomalies, while thumb malformations present with triphalangeal, hypoplastic, or absent thumbs. Scaphoid AVN has only ever been reported in patients presenting with Holt Oram syndrome in cases of trauma. Case Information: A 38-year-old female with a history of index finger pollicization in 1983 for congenital thumb agenesis from Holt-Oram syndrome presented to the clinic for evaluation of radial and ulnar sided wrist pain for one year that bothered her daily. She presented with an MRI that demonstrated avascular necrosis of the scaphoid. Physical examination demonstrated intact pollicization of the index finger with well-healed incisions. Pain located to the scaphoid on flexion and extension of the wrist. Exam was positive for snuffbox tenderness. Patient demonstrated adequate range of motion in all digits. The patient elected to proceed with scaphoid excision and four-corner fusion after conservative therapies had been exhausted. After 2 months of short arm immobilization, fusion was demonstrated on X-ray, and the patient was pain-free on exam with adequate composite fist formation. Conclusions: For patients with thumb absence or hypoplasia, index pollicization is considered the ideal treatment, as it positions a functioning finger in place of the lacking thumb. There is no mention in the literature of scaphoid AVN as a

long-term complication of index pollicization. Treatment of scaphoid AVN in this patient with index pollicization showed similar outcomes to those treated with isolated scaphoid AVN. To our knowledge, this is the first reported case of scaphoid AVN in a patient with a history of index finger pollicization. In this case, treating scaphoid AVN in the traditional fashion has led to a satisfactory outcome in regards to both pain control and function.

PROGRESSING THYROTROPIN-RELEASING HORMONE TOWARDS NEUROTHERAPEUTIC APPLICATIONS

Abstract ID: UNTHSC65 Research Area: Neuroscience Presenter: DANIEL DE LA CRUZ Submission Type: Non-Competition Poster Department: GSBS: Pharmacology & Neuroscience Classification: GSBS Student

Author(s):

- Daniel De La Cruz
- VIEN NGUYEN
- Khadiza Zaman
- LASZLO PROKAI
- KATALIN PROKAI

Abstract:

Purpose: Thyrotropin-releasing hormone (TRH, pGlu-His-Pro-NH2) is a small peptide with numerous neuro-modulatory impacts beyond its role within the neuroendocrine system. TRH's broad central nervous system (CNS) effects, acting as a neurotransmitter and neuromodulator, emphasize a great potential to treat many neurological and psychological disorders. However, its pharmacological applications remain unrealized due to brain delivery shortcomings following its systemic administration. Previously, our laboratory's novel prodrug design, relying on two highly brain-expressed enzymes for prodrug metabolism to TRH, successfully delivered the metabolically highly unstable peptide into the brain. Consequently, an in vivo therapeutic safety assessment was conducted to further validate our prodrug approach through a comparative study that capitalizes on TRH's stimulatory release of thyroid hormones. Likewise, TRH's ability to trigger acetylcholine release is also well documented, and here, this neurochemical marker has been utilized to determine the extent to which TRH is delivered to the CNS via our prodrug approach. Moreover, our laboratory has recently identified pGlu-Î²Glu-Pro-NH2 ([Î²Glu2]TRH) as the first functional antagonist of the central cholinergic actions of TRH, and as such, we have explored the receptor-associated mechanism responsible for this antagonism by utilizing a human TRH receptor (hTRH-R) homology model. Ultimately, our extensive computational chemistry-based studies revealed a novel receptor allosteric site that exhibits a selective and high-affinity binding for \hat{I}^2 Glu2]TRH, while also demonstrating our prodrug's inability to bind and activate this hTRH-R. Methods: Lead TRH prodrugs and various TRH analogues were designed in silico for docking experiments with the

hTRH-R using SeeSAR and AutoDock Vina software. A TRH challenge in CD-1 mice, utilizing systemically administered TRH and an equimolar concentration of a TRH prodrug, measured downstream effector levels of thyroid hormones at several subsequent time points analyzed by LC-MS/MS. Microdialysis studies, in the frontal cortex of SD rats, compared each animal's baseline acetylcholine concentration to subsequent levels, following the perfusion of a TRH prodrug and TRH, as a positive control, at equimolar concentrations. This neurochemical survey quantifies acetylcholine turnover using LC-MS/MS, as a surrogate measure of the extent to which TRH is delivered into the brain via our prodrug approach. Results: Compared to TRH, prodrugs were unable to dock to the hTRH-R's active site, and when systemically administered, the TRH prodrug failed to elicit a thyroid response while simultaneously triggering a profound release of acetylcholine in the brain. Conclusions: The inability of TRH prodrugs to elicit a thyroid response was predicted by its in vitro metabolic stability, as well as computational chemistry studies, that demonstrate TRH prodrugs exhibit physiochemical properties that prohibit the direct activation of the hTRH-R. Furthermore, based on $[\hat{I}^2Glu2]TRH$ as a template, the design of novel hTRH-R inhibitors will be conducted in a follow-up study to further substantiate our prodrug approach and aid the elucidation of TRH activity and pathways.

Summary of a Novel, Non-opioid Local Anesthetic for Post-surgical Pain Relief

Abstract ID: UNTHSC56 Research Area: Pharmacology Presenter: Hunter Kieltyka Submission Type: Non-Competition Poster Department: HSC College of Pharmacy: Pharmacotherapy Classification: HSC College of Pharmacy Student

Author(s):

- Hunter Kieltyka
- Elizabeth Hearn

Abstract:

Purpose: Introducing Zynrelef (bupivacaine/meloxicam) as a new post-surgical medication to relieve pain provides an alternative to opioid use. In recent years, the opioid epidemic has been the cause of numerous overdoses and addictions. By utilizing non-opioid pain relief, we can help combat the ever-growing opioid crisis. Bupivacaine has been utilized for years as a post-operative local anesthetic, working by competitively inhibiting voltage-gated Na+ channels, causing the muscles nearby to relax. However, the inflammation process that occurs after surgery prevents some absorption of local anesthetics, thereby reducing the efficacy of pain relief. Zynrelef is a novel bupivacaine combination product with the addition of meloxicam, a non-steroidal anti-inflammatory drug (NSAID). Meloxicam inhibits COX enzymes, ultimately reducing the inflammatory response. When combined with bupivacaine, the NSAID action enhances the response of the local anesthetic, producing more efficacious pain relief. Additionally, Zynrelef's irrigation application is a novel technique for local pain relief. By irrigating instead of injecting, the inflammatory response and site pain brought on by the injection will be avoided. Clinical trials have shown reduced pain intensities over a 72-hour period in post-operative patients who were administered combination Zynrelef irrigation compared to bupivacaine HCl injection. While the clinical efficacy of Zynrelef is well-documented, the purpose of this study is to compare the cost-effectiveness of Zynrelef irrigation versus another bupivacaine product, Exparel injection. Methods: A drug formulary monograph of Zynrelef was created by thoroughly researching information about its drug class, indications for use, pharmacology, dosing, pharmacokinetics, drug interactions, and clinical efficacy. Once the basis of the drug was established, the precautions, administration options, adverse effects, availability, and cost were compared with Exparel. Results: In bunionectomy, herniorrhaphy, and total knee arthroplasty procedures, Zynrelef scored the lowest on the pain-intensity

scale over a 72-hour period and had the largest percentage of patients who did not request additional opioid therapy compared to bupivacaine HCl and saline placebo. Zynrelef is administered via a needle-free single-dose viscous solution instillation available in both 7- and 14-mL vials, opposed to Exparel's single-dose infiltration injection available in either 10- or 20-mL vials. The average wholesale price of Zynrelef amounts to \$267.50 (14-mL) and \$135.50 (7-mL), and Exparel equates to \$344.20 (20-mL) and \$189.37 (10-mL). Conclusion: Zynrelef results in more efficacious pain relief and reduced opioid usage compared to bupivacaine HCl and saline placebo. Additionally, the use of the irrigation administration could curb the site pain and inflammation associated with injections, eliminating additional need for antiinflammatories and local anesthetics. Lastly, when comparing the cost, Zynrelef shows to be slightly more expensive per dose over a three-day (72-hour) period, but the benefits of adding meloxicam were proven to reduce usage of opioid medications and increase alleviation of pain. A future study that considers potential cost savings from eliminating needles for injection and reducing post-operative opioid prescribing would be beneficial.

Approach to End-of-Life Care Planning in the Outpatient Setting

Abstract ID: UNTHSC49 Research Area: Community Medicine Presenter: Garrett Jackson Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: TCOM DO Student (3rd Year)

Author(s):

- Garrett Jackson
- David Randell
- Lesca Hadley
- John Gibson

Abstract:

Purpose: Advance care planning (ACP) can prepare individuals to receive medical care aligned with their values and experience; however, ACP can be uncomfortable and taboo topic for many patients and thus, a time-consuming conversation for providers. As of 2017, only 1 in 3 of U.S. adults had any type of advanced care directive. Family Practice Associates of Abilene is a primary care clinic that serves an aging demographic with an increased need to address the issues of end-of-life care. Their short-term goal was to increase the initiation of advanced care planning (ACP) by patients 65+ years from October 1, 2021- December 17, 2021; the long-term goal is to see an increased follow-through of patients creating their ACP directives and documents. Methods: For the month of October all patients 65+ years were questioned regarding their ACP status and documented as: complete, desire to initiate, do not wish to initiate. Starting November 1, 2021, all patients 65+ years were first engaged with an educational pamphlet or conversation via the certified medical assistant or medical student prior to the physician encounter. Verbal confirmation of their ACP status was documented as: complete, desire to initiate, do not wish to initiate. Results: From November 1st "" December 17th, there was a >70% increase in the verbal confirmation of the desire to initiate ACP from among eligible patients as compared to prior the implementation. In addition, many of the patients were encouraged to initiate follow-up of their concerns or questions by scheduling their Medicare Annual Wellness visit with the front office postvisit. Conclusion: This approach allowed for brief, multidisciplinary interactions around ACP that adapted to the time-limited care model seen in the outpatient setting1. Future steps could include reviewing the EMR system to quantify how many of the patients followed up on their verbal desire by scheduling a Medicare Annual Wellness exam.

A Leak From Within: A Case Report on Flood Syndrome

Abstract ID: UNTHSC48 Research Area: Structural Anatomy Presenter: Aman Srivastava Submission Type: Non-Competition Poster Department: TCU/UNTHSC School of Medicine Classification: TCU/UNTHSC School of Medicine

Author(s):

Aman Srivastava

Abstract:

Flood syndrome is a very rare complication that can be found in patients with end-stage liver cirrhosis with concurrent ventral hernias. If the hernia ruptures, ascites can begin to leak uncontrollably from the opening which can become a nidus for infection if left untreated. This scenario is known as Flood syndrome, which was first described by Frank Flood in 1961. Flood syndrome is very difficult to manage for physicians as these patients are poor candidates for surgery but the ascitic leak will continue without surgical intervention. Currently, there is no standard of care for Flood syndrome. A 66year-old Caucasian male with a past medical history of NASH cirrhosis, type 2 diabetes, COPD, umbilical hernia, and CAD presented with a sudden burst of ascitic fluid after his umbilical hernia spontaneously ruptured with no inciting event or trauma. The ascites had been progressively getting worse since the patient underwent his last therapeutic paracentesis (two weeks prior to admission) which drained 12.5 liters. Empiric antibiotics were started due to increased risk of bacterial peritonitis. IV albumin was also given to maintain oncotic pressure and prevent " α third-spacing" \Box . Of note, patient was not given any additional fluids due to his hyponatremic state. General surgery and hepatology was consulted and recommended a binder with gauze changes as necessary since patient was a very poor candidate for surgery with a MELD score of 26. MELD scores are an excellent predictor of morbidity and mortality for patients with end-stage liver disease. After the patient was admitted, an attempt was made to control the ascitic leak via a pursestring suture. The patient's abdomen was prepped and draped in the standard sterile fashion. Lidocaine was used to anesthetize the skin of his umbilicus. There was about 2 cm diameter of gangrenous area with a hole leaking ascites in the middle. A pursestring suture of 3-0 chromic gut absorbable suture was placed around the defect to tightly close the wound. The patient tolerated the procedure well. There was no leak detected with the Valsalva maneuver after the placement of the pursestring. Two days later, however, the pursestring failed and the ascites began to leak again around the pursestring through the previously existing defect. Six days later, the patient was transferred to palliative care and later discharged
despite the continued ascitic leak since he was not a transplant candidate or a candidate for surgery per surgery and hepatology. Patient was advised to continue weekly therapeutic paracenteses to manage the ascitic leak. The patient presented again twelve days later due to abdominal pain from a loop of small bowel being incarcerated and strangulated at the umbilical hernia. Despite being a poor surgical candidate, the patient and his wife agreed to undergo an umbilical hernia repair with mesh and small bowel resection due to the emergent nature of his case. The surgery was performed successfully and the patient was discharged from the hospital eleven days later in stable condition.

Patellar Fracture Non-Union with Patella Baja Treated with Repeat Open Reduction Internal fixation and Tibial Tubercle Osteotomy: A Case Report

Abstract ID: UNTHSC32 Research Area: Other Presenter: John M. Ver Hoef Submission Type: Non-Competition Poster Department: TCOM: Medical Education Classification: TCOM DO Student (3rd Year)

Author(s):

• John Ver Hoef

Abstract:

The following case explores a possible treatment modality for instances of patellar nonunion with patellar Baja after fracture. The incidence of patellar non-union is rare, and review of treatment possibilities is limited to a few case series. In this case, a 59-yearold male presents with anterior knee pain and a dysfunctional extensor mechanism. It was found that the patient had patellar non-union after a failed patellar fracture reconstruction four years prior to presentation. The pain was restricting his mobility and reducing his ability to carry out his activities of daily living, and he was seeking definitive treatment. After careful consideration, it was decided a tibial tubercle osteotomy and lift was necessary to ascend the patella Baja, and the patella would be approximated and fixed with k-wire. The procedure was successful and one year later the patient returned for hardware removal. The patient healed well and had regained function in his extensor mechanism. The patient was lost to follow up and did not complete physical therapy. Three years later the patient had returned for checkup and reports significant reduction in pain but is still having difficulty with extension. The patient was found to have atrophied quadriceps muscles in the affected leg leading to weakness and suboptimal knee extension. Though the original reconstruction model had merit, the tibial tubercle osteotomy was elevated slightly too far leading to hyperflexion in the knee and a weak extensor mechanism. This case report serves to review the causation of the patient's outcome and the possible merit in the procedure to treat patellar non-union with Baja. By reviewing cases like these the literature base is increased to help guide clinical decision making in similar situations.

Comparison of dominant and non-dominant knee kinetics in healthy controls versus anterior cruciate ligament reconstruction.

Abstract ID: UNTHSC28 Research Area: General Medicine Presenter: Olivia Panchal Submission Type: Non-Competition Poster Department: Non-UNTHSC Classification: TCOM DO Student (2nd Year)

Author(s):

- Olivia Panchal
- Shiho Goto
- Steven Singleton
- Lindsay Dietrich
- Joseph Hannon
- Craig Garrison

Abstract:

Purpose/Hypothesis: To examine the knee joint loading with anterior cruciate ligament reconstruction (ACL-R) of the dominant (ACL-D) or non-dominant (ACL-ND) limb at the time of return to sport (RTS) compared to matched healthy controls (CON). Subjects: A total of 150 athletes volunteered. (ACL: N=75, Age=15.56ű1.74yrs, Ht=167.93±9.77cm, Mass=67.22±11.39Kg; CON: N=75, Age=15.52±1.91yrs, Ht=168.84±8.33cm, Mass=63.74±11.61Kg). Participants in the ACL-R group underwent ACL-R with a patellar BTB or hamstring graft and were assessed at time of RTS. All subjects in the CON group were considered healthy with no history of lower extremity injury in 3 months prior to testing and IKDC ≥ 95. Materials/Methods: Lower extremity 3-D joint angles and ground reaction force data were collected using an 8 three-dimensional Motion Capture System and force plates. Participants performed 5 double-leg squats (DLS) at a standardized speed (60 bpm). Peak knee extension moment (KnEXTmm) was calculated during the descent phase. Knee joint energy absorption (KnEA) and knee joint energy absorption contribution (KnEAC) were calculated during the same phase. These variables were normalized to the participant's height and weight and averaged across the middle 3 trials. Finally, peak quadriceps (QUADS) isokinetic strength at 60Ű/sec was assessed, normalized to body weight, and averaged across 3 trials. Separate ANOVAs were performed to examine difference between groups. Comparisons were made between those with ACL-D and the dominant limb of the CON-D and between those with an ACL-ND and the non-dominant limb of

CON-ND. Results: In both the ACL-D and ACL-ND groups, KnEA (ACL-D=-0.04±0.02, CON-D=-0.05±0.02; p=0.016. ACL-ND=-0.04±0.01, CON-ND=-0.05±0.01; p< 0.001) and QUADS (ACL-D=1.36±0.51, CON-D=1.79±0.45; p=0.001. ACL-ND=1.40 \hat{A} ±0.38, CON-ND=1.69 \hat{A} ±0.41; p=0.001) were significantly decreased compared to controls. KnEAC (ACL-D, CON-D; p>0.05. ACL-ND=51.73±12.54, CON-ND=60.93±9.83; p< 0.001.) and KnEXT mm (ACL-D, CON-D; p>0.05. ACL-ND=- $0.04\hat{A}\pm0.01$, CON-ND=- $0.05\hat{A}\pm0.01$; p=0.00.) were significantly decreased in the ACL-ND group compared to CON-ND. Significant differences were not observed for these variables between the ACL-D and CON-D groups (p>0.05). Conclusion: Non-significant difference in KnEAC and KnEXTmm in the ACL-D group indicates these subjects performed DLS task at the level observed in the healthy population. However, the significant difference in KnEA in the ACL-D group indicate an overall lower level of loading on the involved limb. All other variables, regardless of side of injury, the ACL-R groups exhibited significantly decreased kinetic and muscle performance relative to healthy controls indicating that side of dominance had little influence on knee biomechanics during DLS at RTS. Clinical Implication: Clinicians should take into consideration which limb underwent ACL-R when designing rehabilitation programs and be aware of these kinetic deficits at the knee joint and attempt to address these differences prior to time of return to sport.

Association between inflammation, white matter hyperintensities, and executive function: the role of ethnicity.

Abstract ID: UNTHSC20 Research Area: Aging / Alzheimer Presenter: Frank Brown Submission Type: Non-Competition Poster Department: Institute for Translational Research Classification: Community Partner (Not for Competition)

Author(s):

- Frank Brown
- Raul Vintimilla
- James Hall
- Leigh Johnson
- Sid O'Bryant

Abstract:

Association between inflammation, white matter hyperintensities, and executive function: the role of ethnicity. Frank Brown1, Raul Vintimilla2, James Hall2, Leigh Johnson2, Sid O'Bryant2, for the HABS-HD Study Team. 1University of North Texas 2University of North Texas Health Science Center, Institute for Translational Research Background: Systemic inflammation and cardiovascular risk factors (CVRF) impact neurological health and executive function. Neutrophils produce inflammatory mediators and lymphocytes regulate the inflammatory response. Neutrophil to lymphocyte ratio (NLR) has been used as a marker of systemic inflammation, and as a predictor of cardiovascular health. CVRF are correlated with white matter hyperintensity volume (WMH), an MRI indicator of cerebrovascular health. This study seeks to compare if there is a difference in the association between inflammation (NLR), WMH, and executive function among Mexican Americans and non-Hispanic Whites. Method: We analyzed data from 1083 (505 Mexican Americans and 578 non -Hispanic Whites) cognitively normal participants from the Health and Aging Brain Study (HABS-HD). All participants signed a written consent, and underwent a 3T MRI (Siemens Skyra), clinical labs, clinical evaluation, and cognitive testing. Differential blood cell counts were used to obtain NLR. WMH volume was measured from FLAIR using the Statistical Parametric Mapping (SPM) Lesion Segmentation Tool. Linear regression was used to predict the effect of NLR and Log transformed WMH adjusted for intracranial volume (derived from Freesurferv6.0 analysis of T1 MPRAGE) on Trails B z-score (executive function), and to evaluate if NLR can predict WMH volume. Analysis was split by

ethnicity. Age, sex, and education were entered as covariates in the models. Results: Sixty-four percent of the total sample were female. Means for the whole sample were: age 66.02, education years 12.98, Trails B 0.19, WMH volume -0.035, and NLR 2.16. When compared to non-Hispanic Whites, Mexican Americans were significantly younger, less educated, had lower Trails B score, NLR values and WMH volume. NLR predicted Trails B scores (B = -0.14, t =-0.12, p = 0.004) only in Mexican American, while WMH predicted Trails B scores in Mexican American (B = -0.16, t = -3.02, p = 0.003), and Non-Hispanic Whites (B = -0.14, t = -4.33, p < 0.0001). Results remained significant after adjusting for age, sex, education. NLR predicted WMH volume (B = 0.13, t = 3.38, p = 0.001) only in Mexican American. Conclusion: Our findings suggest an association between NLR, WMH and executive function in Mexican Americans. NLR and WMH volume predicted Trails B scores in Mexican Americans. WMH predicted Trails B scores, but there was no association between NLR and executive function in non-Hispanic Whites. These findings demonstrate the importance of race consideration when assessing the relationship between inflammation, CVRF, WMH, and executive function.

Subjective memory complaints and cardiovascular risk factors: a cross-sectional study of the HABS-HD cohort

Abstract ID: UNTHSC18 Research Area: Aging / Alzheimer Presenter: Ezek Mathew Submission Type: Non-Competition Poster Department: GSBS: Microbiology, Immunology & Genetics Classification: Dual Degree Student

Author(s):

- Ezek Mathew
- Raul Vintimilla
- James Hall
- Leigh Johnson
- Sid O'Bryant

Abstract:

Background: Subjective memory complaints (SMC) are considered as subjects' interpretation of their cognitive aspects, such as memory and perception. Cardiovascular risk factors such as hypertension, diabetes, dyslipidemia, and obesity may contribute to cognitive decline and their relationship with dementia has been documented extensively. However, there is a lack of literature on the relationship between CVRFs and SMC. Depression has been linked to cardiovascular disease and it is strongly associated with SMC, so it is important to consider the contribution of CVRFs and depression as potentially modifiable factors of SMC. Despite the importance of SMC as a risk factor for cognitive decline, and the higher burden of CVRFs, cognitive decline and dementia among minorities like Mexican Americans (MA), not much attention has been paid to the study of SMC in this population. This study examined the factors associated with SMC in community-dwelling older MA and non - Hispanic Whites (NHW), particularly CVRFs and depression. We hypothesized that CVRFs will be associated with SMC, and that the association will be independent of depression. Methods: We studied 1,376 cognitively normal participants (673 MA and 673 NHW) from the Health and Aging Brain Study (HABS - HD). Baseline characteristics were analyzed using t and chi square tests. The presence of SMC was ascertained by the Subjective Memory Complaints Questionnaire (SCMQ). A logistic regression was conducted to examine the relationship of subjective memory complaints with CVRFs and depression. Age, gender, and education were entered as covariates in the model. Results: MA with SMC had a higher prevalence of dyslipidemia (p=0.008), and depression (p<0.0001) than those without SMC. Fifty nine percent of the NHW sample were female. NHW with SMC were

less educated than those without SMC (mean education years 15.26 vs 15.83), and have a higher prevalence of diabetes (p=0.04) and depression (p< 0.0001). When comparing baseline characteristics of MA (323) and NHW (269) with SMC, we found that MA were younger (mean age 63.74 vs 68.85) and less educated (mean education years 9.38 vs 15.26). MA with SMC had a higher prevalence of diabetes (p < 0.0001) and obesity (p=0.0001) when compared with NHW with SMC. Depression was strongly associated with SMC in MA (OR 3.46; 95% CI = 2.45 "" 4.89) and NHW (OR 2.22; 95% CI = 1.59 "" 3.10). Dyslipidemia was also associated with SMC in MA (OR 1.73; 95% CI = 1.25 "" 2.40). NHW with less education had an increased likelihood of exhibiting SMC. Conclusions: Our findings suggest that the association of CVRF and SMC differs among MA and NHW. Depression was strongly associated with SMC in both groups. In MA, dyslipidemia was also associated with SMC in MA, while education was a significant factor only in NHW. The complex relationship between memory complains, vascular risk factors, and depression requires longitudinal studies for further clarification. Understanding SMC and its racial differences may allow early interventions to prevent cognitive decline.

Delivering Caregiver Education to Dementia Family Caregivers in the Primary Care Setting

Abstract ID: UNTHSC14 Research Area: Education Presenter: Sadie Thompson Submission Type: Non-Competition Poster Department: TCOM: Family Medicine and Osteopathic Manipulative Medicine Classification: Dual Degree Student

Author(s):

- Sadie Thompson
- Lesca Hadley
- Rebecca Daley

Abstract:

Study Objective The purpose of this study is to determine whether dementia caregiver education can be distributed at clinic visits in the primary care setting. Family caregivers of those with dementia report being significantly more stressed when compared to non-dementia caregivers.2 Negatively impacted health outcomes for family members increase the total burden of dementia on the health care system. This study aims to equip dementia caregivers with resources that help them cope with caregiver-associated stress. Methods This study took place in a rural primary care setting over a five-week period. Educational brochures were designed to provide family caregivers with coping strategies, communication strategies, and support group information. Family caregivers were identified upon their accompaniment of a patient with dementia to their appointment. Results During this period seven patients with an established history of dementia attended routine appointments accompanied by a family caregiver. Caregivers of all seven patients received an educational brochure and were counseled on the contents of the brochure for at least five minutes. At the point of enhancement, caregivers expressed gratitude at the acknowledgment of the burden of caregiving and the receipt of the educational materials. Conclusions and Limitations The results of this study support the ability of primary care providers to increase the education of dementia caregivers at regular office visits. Limitations to this study include the ability of family caregivers to attend appointments with dementia patients and patient identification of family caregivers. Further studies should be done to evaluate dementia caregiver stress before and after receiving education on caregiving. References: 1. Caregiving for Family and Friends - A Public Health Issue. Centers for Disease Control and Prevention. https://www.cdc.gov/aging/caregiving/caregiverbrief.html. Published July 30, 2019. Accessed July 16, 2021. 2. Cheng ST. Dementia

Caregiver Burden: a Research Update and Critical Analysis. Curr Psychiatry Rep. 2017; 19(9). doi: 10.1007/s11920-017-0818-2

