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Cover Art

“Neuron” by Helen Rynor
M.D. Candidate, Class of 2021.
Florida International University
Cross published in Eloquor, 2019
Dear Readers,

We are proud to present the first issue of the fourth volume of the Florida Medical Student Research Journal (FMSRJ). This journal was founded in 2015 by two medical students at the Florida International University (FIU) Herbert Wertheim College of Medicine (HWCOM) as a means to showcase the academic achievements of medical students. The FMSRJ publishes work from any health professional or student related to medicine for peer review by Florida medical student editor teams. Through the continued efforts and talent of the student editorial teams, the journal has developed to represent a venue for innovative, scholarly pursuits.

This year has been unprecedented. Manuscript submissions exceeded all previous years, readership and published materials have expanded beyond FIU, there is collaboration with FIU student journal Eloquor; and faculty experts were incorporated into the peer review process alongside student editors.

Our team presents original research representing a range of topics from the bed to the bedside followed by interesting case reports of rare conditions, surgical innovation, and a reminder of the importance of providing thorough, quality care. Readers will then enjoy clinical reviews of related to the fields of dermatology and oncology topics as well as a historical narrative of the role of physicians in early Florida. We are honored to contribute to the existing academic discussions relevant to these articles. In addition to the articles, we also publish the proceedings of the 2019 FIU HWCOM research symposium.

This issue would not have been possible without the generous support of our Executive Advisory Board Drs. Sheldon Cherry, Joe Leigh Simpson, and Juan Acuña as well as the numerous faculty advisors who served as expert reviewers and mentors to the student editors. Thank you to the student editors, authors, administrative personnel, and design team whose guidance, dedication, and work helped to realize the publication of this issue. A special thank you to Helen Rynor, Emily Giesler, and Eloquor for the beautiful cover art and art pieces amongst the research. It was truly our pleasure to have this opportunity to work alongside and manage such an incredible team. Lastly, thank you to our families whose unwavering support and example continue to inspire and motivate us to achieve our goals.

We hope this issue will inspire your curiosity and encourage you to continue on the pursuit of your academic aspirations.

Sincerely,

Nicole M. Miller
Editor in Chief

Karmal P. Kiniger
Editor in Chief

Thank You to Judges

Go With the Flow: Trans-TIPS Complete Esophageal Variceal Embolization

Renal Vein Thrombosis: A New Age Interventional Approach to a Classic Ballad

Herpes Zoster: Case Review and Discussion

A Case of Dizygotic Twin Pregnancy Concordant for Nonsyndromic Cleft Lip and Palate with Differing Severity

Similarities to Escherichia coil RseA and Other Pathogens

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At-Risk Populations in Miami-Dade County

Ethnic Disparities and Chest X-rays in the Emergency Room

Pseudomonas aeruginosa Anti-sigma Factor MucA Shows Essential Similarities to Escherichia coil RseA and Other Pathogens

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Dear Readers,

This is the first issue of The Florida Medical Student Research Journal published since I began my tenure as the Dean of Herbert Wertheim College of Medicine. It brings me great joy to be able to address you, the readers, in a forum that is dear to me. Medical education is grounded in social consciousness and a commitment to improving human welfare. As medical professionals involved in basic or clinical research, patient care, and medical education, we share in the noble mission to improve medical care and, thereby, realize better outcomes for all diseases.

Our efforts as scientists, clinicians, and educators are interwoven, addressing the social determinants of disease and the biological basis of disease to improve the human condition. Medical journals such as The Florida Medical Student Research Journal provide forums for disseminating knowledge gleaned through the research, and facilitating translation of that knowledge into actionable strategies that improve patient welfare.

Peer review is essential to the process of validating research findings. The Florida Medical Student Research Journal offers medical students the opportunity to participate in peer-review and to have their own work published. I look forward to collaborating with the students and the readership as we continue to promote scholarly productivity and innovation through medical research.

Our medical school is entering the digital age and presenting information for learning is challenging. The Florida Medical Student Research Journal will be at the forefront in enabling our goals of “bench to bedside” medical care.

On a personal level, I again want to state my great honor and privilege to have the opportunity to work with, and for, each of you to build a very special medical school.

Sincerely,

Robert Sackstein, M.D., Ph.D.

Senior Vice President for Health Affairs
Dean, Herbert Wertheim College of Medicine
Pseudomonas aeruginosa Anti-sigma Factor MucA Shows Essential Similarities to Escherichia coli RseA and Other Pathogens

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Abstract

Pseudomonas aeruginosa is a Gram-negative, ubiquitous bacterium that often causes respiratory infections in individuals with cystic fibrosis (CF). A major factor contributing to patient morbidity and mortality in these infections is the production of a polysaccharide called alginate that protects the bacterium from the host’s immune system and antibiotic therapies. Ordinarily, the sigma factor (AlgT/U) required for alginate biosynthesis is sequestered to the inner-membrane of the cell by MucA, an anti-sigma factor; if MucA is cleaved or mutated, AlgT/U is left free to guide RNA polymerase to transcribe the genes needed for alginate production. MucA is a crucial player in alginate regulation. However, not much is known about the active sites in MucA that play this critical regulatory role.

The Escherichia coli homolog, RseA, however, has been extensively studied and its active sites have been determined experimentally. This study compared the two, as well as twelve other pathogenic bacteria with homologs to RseA. The protein sequences were aligned and two conserved domains were identified by batch search in PFAM. While there is low overall sequence homology between the various proteins, homology is much higher within the identified domains. Moreover, the residues within the active site necessary for sigma factor binding- as determined experimentally in E. coli- were conserved across all species analyzed. These findings will guide future work to verify the results in vitro and could lead to the development of an anti-alginate therapy by restoration of MucA functionality or the generation of a synthetic MucA that could sequester AlgT/U.

Key Words: alginate, exopolysaccharide, sigma factor, cystic fibrosis

Introduction

Pseudomonas aeruginosa is a gram-negative, ubiquitous bacterium that is the leading cause of death in those with cystic fibrosis (CF), a common autosomal recessive genetic condition in which a buildup of mucus provides an ideal environment for bacterial colonization1. One of the major contributing factors to the morbidity associated with P. aeruginosa is the production of an exopolysaccharide called alginate2-4. Alginate is produced when the cell senses some stress in the environment, such as the oxidative radicals of the immune response, antibiotic therapy, or desiccation. The polysaccharide coats the cell and acts as a physical barrier to the stressors5. Isolation of an alginate-producing strain from the lung of a CF patient is indicative of a very poor prognosis6. More than likely, the patient will die from the infection7.

Alginate production is metabolically expensive for P. aeruginosa. Thus, it is tightly regulated and only expressed when necessary8. The primary regulatory unit of alginate production is a five-gene operon containing algT/U-mucA-mucB-mucC-mucD9,10. The first gene of this operon, algT/U, codes for a sigma factor able to bind to RNA polymerase (RNAP), guiding it to transcribe the genes necessary for alginate production9,10.

Ordinarily, MucA, an anti-sigma factor, sequesters AlgT/U to the inner membrane, preventing it from directing RNAP; however, when mucA is mutated or cleaved, AlgT/U is left free to guide RNAP (Figure 1) to transcribe the genes needed for alginate biosynthesis8,11,12.

MucA is a 194 amino acid protein which is localized to the inner membrane of the P. aeruginosa cell13. It has two domains: the cytoplasmic N-terminus that interacts with AlgT/U and the periplasmic C-terminus that interacts with MucB14 (Figure 1). The periplasmic AlgtU-MucA-MucB complex (Figure 1) is the bottleneck of the whole alginate regulatory process.

As a result, MucA is a prime target for potential anti-alginate therapies: restoring or enhancing the function of MucA could reduce P. aeruginosa alginate production, thereby making the bacterium more susceptible to traditional antibiotic therapies. Knowledge of its active sites could also lead to the generation of a synthetic MucA which could effectively sequester AlgT/U. We investigated the relation of MucA to any functional or structural homologs in other pathogenic bacteria. The Escherichia coli homolog, RseA, was selected for a central role in this analysis due to the great amount that is already known about this protein experimentally15-17. The phylogenetic information could then be used to predict active sites in MucA based on the alignment of MucA with known MucA mutations that result in alginate production. P. aeruginosa database16. The accession number was searched in PFAM to find the domain families it contains (PFAM ID: PF03872 and PF03873). The 12 sequences for each domain were then extracted into separate FASTA files. Two strains of P. aeruginosa with known MucA mutations that result in alginate production- PDO300 and PA2412- were also included in the analyses.

The 12 whole protein sequences were then submitted to Pfam search to identify protein domains. The sequences were then aligned with Muscle18 in Jalview19. After analyzing these results, Uniprot20 was used to identify the experimentally determined structure and active sites of the E. coli homolog RseA and then these were compared to the multiple sequence alignment (MSA) to check for conservation of sites across the various species.

Results

A review by Pandey et al. compared the homology of the E. coli stress response pathway proteins (Table 1). This analysis showed that while RseA in E. coli and MucA in P. aeruginosa are functional homologs, they only share 28.3% sequence homology. Thus, there was a need to investigate if the active sites of the proteins are conserved between the two species.
Table 1: The numbers refer to percentage homology as determined using ClustalW. The shaded boxes compare the functional homologs.

Table: The MSA by Muscle with defaults used. The MSA was used to determine conserved residues. The two PPFAM domains are in the green boxes, and the conserved active sites are colored with Taylor and labeled by known function in E. coli.

Discussion
Although MucA is varied in sequence across species of pathogenic bacteria, this study suggests that what is learned from studies on E. coli RseA may be applicable to P. aeruginosa and the other species we analyzed as well.

It was seen that the same two PPFAM domains are present in all the sequences. Despite the lack of sequence homology across the whole protein, the active sites identified experimentally by other authors in E. coli were conserved across all sequences. Alignment of the individual domains would further solidify this conclusion. The analysis could also be expanded to include a larger set of pathogenic and non-pathogenic bacterial species.

While mutagenic studies are needed to confirm the active site predictions made in this study, the conservation across the species analyzed at the same locations as the active sites of RseA strongly leads to the hypothesis that these are indeed the active sites in the other species. This will help direct future investigations of MucA. Specifically, the newly-identified, potential active site can be mutated to verify that they are the active sites in P. aeruginosa. Further in silico structural analyses could be performed to see what effect the mutations in PDO300 and PA2192 may have on MucA function as compared to E. coli and the Pseudomonas wildtype. These two strains are of particular interest since PDO300 harbors the most common mucA mutation leading to alginate production (mucA22) and PA2192 is a clinical isolate that produces almost twice as much alginate than other mucoid P. aeruginosa strains.

Conclusion
There is an urgent need for some form of an anti-alginate therapy. Mucoid P. aeruginosa infections are the leading cause of death in CF. This therapy will likely be a combination therapy with various classes of antibiotics: the anti-alginate compound could expose the bacteria allowing the antibiotic to be effective. As of yet there is no approved and effective anti-alginate therapy. The only current therapeutic option is higher and higher doses of last resort antibiotics that are non-functional. The sum of the present analyses and the proposed studies could lead to therapies that enhance the functionality of MucA in P. aeruginosa or generate synthetic Muca homologs that sequester AlgT/U, thereby lowering alginate production and alleviating the morbidity and mortality concomitant upon infection with an alginate producing strain of P. aeruginosa.

References
Investigation of Fanconi Anemia: The Downstream Genetic Pathway

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Abstract

Introduction: A key response mechanism to DNA damage is the Fanconi Anemia (FA) repair pathway, which involves homologous recombination DNA repair. A FA repair deficiency is considered to increase the sensitivity of tumors to DNA-targeted agents and may prove to be a target of cancer treatment. We aim to explore the association between the FA repair pathways and downstream genes that influence tumor growth.

Methods: To generate FANCD2 knockdown cells, human lung cancer cell line A549 was transduced with FANCD2-specific short hairpin RNA (shRNA) expressing and puromycin-resistant lentiviral particles or control shRNA lentiviral particles. The cells were cultured and successful FANCD2 knockdown was confirmed by knockdown. Our results provide a starting point for developing DNA response pathways. It has been recognized that DNA repair checkpoints are crucial for hindering induction of neoplasms, root to defects in DNA damage response pathways. Abnormalities in oncogenes and tumor suppressors can drive mutations to initiate onset and progression of cancers. Known DNA repair proteins such as BRCA1 and FANCD2 can be detected in cancer cells and serve as markers for competent DNA repair function.

A key response mechanism to DNA damage is the Fanconi Anemia (FA) pathway, which involves homologous recombination DNA repair. The Fanconi Anemia pathway is activated through mono-ubiquination of the FANCD2 protein. Homologous recombination repair (HRR) is essential to prevent genomic instability related to double strand DNA damage and stalled DNA replication forks. Deregulation of homologous recombination repair genes such as FANCD2 have been identified in non-small cell lung cancer, although it is not known whether carcinogenesis is associated with a functional HRR deficiency. The identification of homologous repair-deficient tumors is a significant challenge in oncology research, particularly when taking into consideration the complexity of the DNA damage response system. HRR deficiency may increase the sensitivity of tumors to DNA-damaging agents such as platinum or targeted agents such as PARP inhibitors. FA homologous repair deficiency may therefore prove to be a target of cancer treatment, as long as appropriate biomarkers become available to identify patients with these tumors. Currently, there is a growing appreciation of DNA repair deficiencies in lung cancer prevention and treatment, given the high prevalence of lung cancer and increased efficacy of DNA-damaging drugs. A study conducted by Duan, et al reported the detection of 22% of NSCLCs to be FA functionally inactive by the Fanconi Anemia Triple Staining Immunofluorescence test, indicating the clinical relevance of the detection and targeted treatment for patients with FA deficient tumors.

The FA pathway includes multiple genes which form foci of DNA repair on chromatin during the S phase of the cell cycle and during DNA damage. The FA proteins encoded by these genes are thought to work cooperatively in a common signaling pathway to repair intercross links. The FA repair mechanism contains 16 complementation groups, and eight of the proteins are subunits of the FA-core complex-1, which activate FANCD2 in response to DNA damage. As deregulated FANCD2 (FANCD2 knock-down) cell foci formation is associated with tumorigenesis, we hypothesize that lung cancer cells with reduced FANCD2 expression will...
decrease in oncogenic activity was observed with increased expression of AKT5. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of AKT5 expression, which could be a potential therapeutic target for lung cancer treatment.

Methods
To generate FANCD2 knockdown cells, human lung cancer cell line A549 was transduced with FANCD2-specific shRNA. Five selected genes demonstrated gene expression change by at least 5-fold with FANCD2 knockdown in the A549 cell line. These findings do not correlate with our hypothesis, as we postulated that knockdown of FANCD2 was associated with increased ovarian cancer risk and increased transcriptional activity. The RNA5S16 gene demonstrated the most significant gene expression change, with a change of -19122373.25 fold in the A549 cell line. This demonstrates that FANCD2 knockdown may have a functional role in the regulation of RNA5S16 expression, which could be a potential therapeutic target for lung cancer treatment.

Results
Five selected genes demonstrated gene expression change by at least 5-fold with FANCD2 knockdown in the A549 cell line. These findings do not correlate with our hypothesis, as we postulated that knockdown of FANCD2 was associated with increased ovarian cancer risk and increased transcriptional activity. The RNA5S16 gene demonstrated the most significant gene expression change, with a change of -19122373.25 fold in the A549 cell line. This demonstrates that FANCD2 knockdown may have a functional role in the regulation of RNA5S16 expression, which could be a potential therapeutic target for lung cancer treatment.

Discussion
Gene expression profiles were determined in order to identify genes and associated pathways differentially regulated upon FANCD2 knockdown. Five genes were determined as very significant in terms of downregulation in response to FANCD2 knockdown. These genes include: AC011558.5, RP11-30N15.6, PL2A4B, RP4-635E18.7, and RP11-321N4.5. The Phosphopase A2, group IVB (PL2A4B) gene was downregulated with FANCD2 knockdown and exhibited a -3169689.70 change in the A549 cell line. Fusion of PL2A4B with JMJD7 has been reported in head and neck squamous cell carcinoma (HNSCC). This read-through fusion gene modulates phosphorylation of Protein Kinase B (AKT) to promote HNSCC tumor survival. This suggests the oncogenic function of PL2A4B, as ablation of this fusion gene inhibited proliferation of breast cancer cells by promoting G1 cell cycle arrest and increased starvation-induced cell death compared to JMJD7- only knockdown HNSCC cells. Additionally, basal expression of this gene was higher in breast cancer cells HCC1143, further supporting the oncogenic function of this lipolytic gene.

Table 1: Downregulated genes associated with FANCD2 knock-down in A549 cancer cell line. Five selected genes demonstrated gene expression change by at least 5-fold with FANCD2 knockdown in the A549 cell line. These findings do not correlate with our hypothesis, as we postulated that knockdown of FANCD2 was associated with increased ovarian cancer risk and increased transcriptional activity. The RNA5S16 gene demonstrated the most significant gene expression change, with a change of -19122373.25 fold in the A549 cell line. This demonstrates that FANCD2 knockdown may have a functional role in the regulation of RNA5S16 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 2: Upregulated genes associated with FANCD2 knock-down in A549 cancer cell line. Five selected genes demonstrated gene expression change by at least 5-fold with FANCD2 knockdown in the A549 cell line. These findings do not correlate with our hypothesis, as we postulated that knockdown of FANCD2 was associated with increased ovarian cancer risk and increased transcriptional activity. The RNA5S16 gene demonstrated the most significant gene expression change, with a change of -19122373.25 fold in the A549 cell line. This demonstrates that FANCD2 knockdown may have a functional role in the regulation of RNA5S16 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 3: Correlation of FANCD2 knockdown to AKT5. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of AKT5 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 4: Correlation of FANCD2 knockdown to RNA5S16. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of RNA5S16 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 5: Correlation of FANCD2 knockdown to JMJD7. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of JMJD7 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 6: Correlation of FANCD2 knockdown to PL2A4B. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of PL2A4B expression, which could be a potential therapeutic target for lung cancer treatment.

Table 7: Correlation of FANCD2 knockdown to AC011558.5. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of AC011558.5 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 8: Correlation of FANCD2 knockdown to RP11-30N15.6. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of RP11-30N15.6 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 9: Correlation of FANCD2 knockdown to PL2A4B. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of PL2A4B expression, which could be a potential therapeutic target for lung cancer treatment.

Table 10: Correlation of FANCD2 knockdown to AC011558.5. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of AC011558.5 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 11: Correlation of FANCD2 knockdown to RP11-30N15.6. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of RP11-30N15.6 expression, which could be a potential therapeutic target for lung cancer treatment.

Table 12: Correlation of FANCD2 knockdown to PL2A4B. Our study supports the hypothesis that FANCD2 knockdown may have a functional role in the regulation of PL2A4B expression, which could be a potential therapeutic target for lung cancer treatment.
is consistent with our hypothesis of gene downregulation with FANCD2 knockdown. Conversely, RPP1-101F7.1, RPP1-360L3.7, and RPP1-29803.5 genes resulted in a significant upregulation in the A549 cell line, suggesting that different isoforms of RPP1 are influenced by different regulatory mechanisms with FANCD2 knockdown.

Genes related to cell proliferation are expected to be downregulated with FANCD2 knockdown, as FANCD2 is considered to promote cell growth through interactions with cell proliferation pathways such as PI3K-AKT-mTOR pathway.2,3 Inhibited oncogenic function due to FA pathway knockdown is expected to reduce cell proliferation. However, the results show that the 3 upregulated genes also have oncogenic function. These genes may have other functions beyond the scope of carcinogenesis, which may explain gene upregulation with FANCD2 knockdown.

Evaluation of genes in FA deficient lung tumors was assessed by FANCD2 knockdown and evaluating concurrent gene expression changes. Identifying genes with significant expression change in FA deficient tumors, such as PLAG2G4 and RPP1-350N15.6, can direct the genetic-based therapy for treatment of NSCLC with alterations in the FA repair pathway. Genes such as RPP4-653E18.7 and PLAG2G4 were found in other cancers, further supporting the role of gene regulation in tumorigenesis for these specific genes. Given that these genes expressed significant change in regulation in lung cancer cells with FANCD2 knockdown, it may be valuable to further investigate the role of these genes in normal and malignant cells. FA homologous repair may be a target of cancer treatment, as long as appropriate biomarkers become available to identify patients with these tumors4.5

Our results provide a strong starting point for the development of treatments targeting genes associated with the FA pathway and the understanding of the mechanism of action of the repair pathways in lung cancer cells. Identification of FA downstream genes in FA deficient cell lines, such as A549 cell line, suggests that different isoforms of RP11 are influenced by different regulatory mechanisms with FANCD2 knockdown.


United States. To another. By understanding clinical perspectives around the medical standardized the hand-off of patients from one in-patient department in healthcare delivery and its relationship to medical error in healthcare. This study seeks to further explore the complexity of miscommunication all care team members (Figure 1). The checklist is used primarily by the New England recently implemented a medical reduction initiative conferences, and standardization of inter- and intra- departmental root-cause analysis committees, departmental morbidity and mortality conferences, and standardization of inter- and intra- departmental hand-offs of patients and information. An in-patient department of a large academic medical center in New England recently implemented a medical reduction initiative by standardizing the patient hand-off between the department and another in-patient department within the hospital in 2016. Along with incorporating all of the I-PASS elements (detailed in Figure 1), the new standardized hand-off is a checklist that also requires introductions of all care team members (Figure 1). The checklist is used primarily by the physicians and the residents but contains tasks and responsibilities for other care team members present during the handoff as well. This study seeks to further explore the complexity of miscommunication in healthcare delivery and its relationship to medical error in healthcare systems at an academic medical center in New England that standardized the hand-off of patients from one in-patient department to another. By understanding clinical perspectives around the medical reduction initiative that was implemented within this hospital, this paper hopes to shed light on how actors at the forefront of healthcare delivery view medical reduction initiatives that are intended to instill greater patient safety and positively change practice. These findings may potentially be extrapolated to other healthcare systems in the United States. Few studies have sought to examine clinicians’ perspectives on such initiatives, and this study seeks to add to the limited literature. Attention needs to be directed towards understanding clinicians’ perspectives around medical error reduction initiatives in order to improve upon the ways of reducing medical error. This study seeks to answer the question: “What are clinicians’ views towards a standardized hand-off checklist protocol as an approach to reduce medical error?”

Methods

The qualitative method of grounded theory was used to accomplish the research goal. Grounded theory is useful when no relevant existing framework exists, and important themes emerge upon the analysis of collected data on participants’ own experiences. Semi-structured individual telephone and in-person interviews were used as the method of collecting data because it encourages open commentary and allows for the in-depth exploration of individual experiences. The experience of using a hand-off protocol such as a standardized checklist is personal, and semi-structured interviews provided the opportunity to delve deeper into specific aspects of people’s views and thoughts on the hand-off protocol. Because different levels of participants (attending physicians, residents, and other clinical staff such as nurses and physician assistants) interact in a hierarchical manner which may lead to sensitivities and unique perspectives in regards to the new hand-off protocol, interviews were conducted on an individual basis.

All clinicians who had experience of both the old and new hand-offs within an in-patient department at an academic medical center in New England were invited to participate via e-mail by the convenience sampling method in April 2017. Those that did not respond received a follow-up e-mail 20 days later. Participation was voluntary. The study received approval by the Dartmouth College Institutional Review Board (IRB).

Within an in-patient department of a non-profit academic medical center in New England, 60% of the clinicians were recruited to participate in this study. The clinicians included physicians, physician assistants, and nurse providers. During May 2017, phone interviews were conducted with physicians and other clinicians within the in-patient department. All participants received and acknowledged an information sheet for the study prior to the phone call that served as the consent form. Each interview lasted approximately 20 minutes and was audio-recorded. Each interview was conducted using a scripted, semi-structured interview guide and followed-up with probes as necessary. Interview guide can be provided upon request. The interview guide was drafted, piloted on non-participants, and refined on the basis of their comments. All but one of the audio-recordings were transcribed verbatim using TranskriptF, a secure online audio transcription software, and were de-identified before analysis. One audio-recording was not transcribed verbatim due to a lack of recording clarity; however, notes were taken while listening to the recording. These notes were then coded using the same coding structure as the rest of the transcribed data. The total number of participants (n) whose comments were coded under respective themes were only provided if the count is ten or more. This approach was used to maintain participant confidentiality.

Consistent with the grounded theory methodology, analysis started simultaneously with data collection to establish that the interviews were capturing intended collected data and to consider potential new topics to include in subsequent interviews. Transcripts were read dually and a semi-structured process in a group environment was used to meet and compare and discuss emerging themes. The coding structure was refined over two weeks until no further codes or categories emerged from the collected data, the coding structure seemed stable, and the group of advisors agreed upon the coding structure. Upon reaching consensus of the coding structure, theoretical saturation was reached. All interviews were coded with the coding structure and the coded data were analyzed to elicit themes surrounding medical error, the old handoff method, and the new standardized checklist. Major themes emerging from the analysis and descriptions of the old versus new handoff methods are discussed below in the order that participants were asked about their thoughts as per the interview guide. The term “negative code” refers to coding that suggested dislike or disagreement of a topic and the term “positive code” refers to coding that suggested liking, appreciation or approval of a topic.

Results

Participants’ descriptions of medical error evolved over the course of the interview. When initially asked how they would define ‘medical error,’ all of the interviewed clinicians mentioned an unplanned event. At the end of the interview when asked about how the implementation of the standardized checklist might have changed their perspective on medical error, participants’ descriptions shifted towards the idea that mistakes are inevitable. However, all other codes to the initial question regarding defining medical error and the latter question in regards to whether or not changes from the medical error reduction initiative were the same for each respective participant. As seen in Table 1, some participants described medical error as harming the patient, systemic failure, and care-related problems (Table 1). A few participants also mentioned the complexity of healthcare results in medical error.

When asked to describe what they liked and disliked about the old handoff methods used before the standardized checklist was implemented, the majority of participants reported that they did not receive enough information in the past and that different providers would provide contradictory information. However, no nurse mentioned the latter issue. In general, the participants described the old handoff to be unstructured and lacking in standardization. Some participants also mentioned hesitance to raise issues when they did not personally know everyone present for the handoff. Having to ask too many questions after the handoff had occurred was also a commonly cited problem. One physician mentioned that there were care coordination issues (such as not being notified about a patient’s arrival) with the old handoff. As seen in Table 2, interviews only contained negative codes for participants’ descriptions of the old handoff methods (Table 2).

All participants responded that the new standardized checklist provided more structure during information transfer and found the introduction piece of the checklist to be helpful and have a positive effect on team dynamic. One participant, however, did mention they found the introduction “stifled” and too formal. Many participants said that everyone observed and wrote notes during these handoffs and that only one person talks at a time with the new standardized checklist. Physicians specifically commented on the fact that introductions help instill in terms of knowing roles—knowing what their own and others’ responsibilities were—prior to the information transfer during the handoff. As seen in Table 3, almost all of the coded interviews only contained positive codes for participants’ descriptions of the new standardized checklist; only one negative code was applied (Table 3).

Overall, negative codes were used to describe the old handoff and positive codes were used to describe the new standardized checklist. The only concern mentioned about the change in the handoff was that the other department felt that the new standardized checklist might take too much time; this concern was only cited by physicians. All of the physicians also mentioned that the change in the handoff instilled a culture of improvement within the department.

Participants defined medical error as harming the patient and a systematic failure. Medical error was also described as having an unplanned element and being related to care. The complexity of healthcare and the fact that mistakes are inevitable were also cited during participants’ discussions of medical error. Participants felt that they were not receiving enough information and often received contradictory information from the other department. A lack of structure, format, and standardization was also attributed to the old handoff method. Clinicians also mentioned the issues of not knowing people that they would encounter during the handoff. In terms of the new standardized hand-off checklist, all participants cited greater structure and standardization. All of the participants also appreciated the introduction aspect to the checklist. Many participants felt they knew who was in the room and what each participant role was; they also felt that colleagues were more active and paying more attention during the handoff. It is interesting to note that only one participant mentioned a negative code when describing the new handoff. Although appreciative of the introduction’s purpose, one participant found the introduction piece of the new checklist to be somewhat artificial in nature. It could be possible that other participants might have felt similarly but may not have felt comfortable opening up about negative aspects to the new checklist. Other clinicians that were not interviewed within the two in-patient departments could also have had a hands-off method that was as good or better. If this was the case, the new checklist would take considerably longer after hearing about the process from others. However, they also mentioned the standardized checklist instilled a culture of quality improvement in the department and was worth the marginal increase in time.
Discussion

Since this was a small pilot study, there were significant limitations in study sampling and logistics. Logistical limitations included a 1-month period of data sampling and collecting interview data remotely. In regard to the study sample, there were four main limitations. First, a convenience sampling method was used because it was the quickest and easiest way to recruit participants. This is not the most ideal form of sampling and introduces sampling bias; therefore, the results of this study may not be generalized to the rest of the population. In addition, the sample size was small. In order to maintain confidentiality, counts were not provided and an in-depth comparison across different provider roles was not done; only a surface level comparison and analysis of role differences was done. It should also be noted that only one of the two in-patient departments (the receiving department) involved with the new hand-off checklist was interviewed. Ideally, both in-patient departments should have been interviewed. Lastly, since the nature of clinicians’ daily schedules is generally busy and hectic, recruiting participants was difficult, leading to scheduling difficulties and a small sample size.

Future studies should use a larger sample size—this would allow for a comparison of perspectives of different types of providers and a more robust analysis in terms of numbers and statistics. Future studies should also look at both departments involved in a hand-off initiative such as the one studied; participants should be from both the department giving the information and the department receiving the information in order to get a more accurate representation of how clinicians feel towards a particular handoff initiative. Larger studies could compare clinicians’ perspectives from different hospitals or between standardized hand-off checklists within the same hospital or between different hospitals. Future studies could also look at how clinicians view the “standardized checklist” initiative as compared to other hand-off medical error reduction initiatives specifically or other medical error reduction initiatives in general.

Clinicians within an in-patient department of an academic medical center in New England had a diversity of definitions for the term “medical error.” They also found a recently implemented standardized hand-off checklist to be a helpful and effective medical error reduction initiative. Since this pilot study was limited in scale, identified diversity in defining medical error, and elucidate a positive response from clinicians in regard to a new standardized handoff checklist, further research should be conducted on clinical perspectives on medical error definitions and reduction initiatives in order to better understand and support healthcare quality improvement projects. This study underlines the benefit of and appreciation for more standardized processes such as checklists; therefore, healthcare institutions should continue to implement such medical error reduction initiatives.

References

Abstract

Introduction: Medical Students Working to Improve Society and Health (MedSWISH) is a student run organization, whose goal is to provide health screenings, health education and referrals for long-term care to community members at health events in Miami-Dade County. The purpose of this paper is to describe the health event population that MedSWISH has seen thus far so that future services may be tailored to meet the community’s needs.

Method: A group of medical students from Florida International University, supervised by a licensed physician, attended 10 different health events. There, they provided all willing adults with health screenings on their body mass index (BMI), body fat percentage, blood pressure, and blood glucose. On the day of the event, MedSWISH provided participants with their results and health education on the results of their screenings, in adherence to United States Preventive Screening Task Force (USPSTF) and Eighth Joint National Committee (JNC8) guideline recommendations on obesity, hypertension and diabetes.12,13 An individualized approach was used, whereby medical students partnered with the participants to create a suitable plan for the latter to improve their health metrics. These recommendations included evidence-based and health education programs, such as smoking cessation, mindfulness, stroke awareness, and cancer screenings. A team of medical students, supervised by an FIU HWCOM physician, attended 10 community health and wellness events. They were responsible for reaching out to the community and advertising the health event.

Results: Out of the 331 participants consented from the ten individual events, 41.3% of them were obese, 38.1% fell within the hypertensive range and 13.0% fell within the diabetic range. More than 20% of the participants had elevated reading on any of the metrics was subsequently seen by the supervising physician. Once the screening completed, the participants’ data collected from 10 different health events in Miami-Dade County were transferred to the supervising physician. All the medical students in attendance were volunteers who had been trained by MedSWISH on the proper technique to measure BMI, body fat percentage, blood pressure and blood glucose. The health events were organized by local community partners who invited MedSWISH, as well as other organizations and vendors, to provide services. The community partners were responsible for reaching out to the community and advertising the health event.

In order to better cater to the medical and educational needs of the local community, MedSWISH has begun an Institutional Review Board (IRB) approved research project to assess the population served at its health events. The purpose of this paper is to describe the population that MedSWISH has served over the last year. By evaluating the demographics and health metrics of the communities served, MedSWISH aims to improve the health screenings and health education provided, by tailoring them to their respective health event.

Methods

This comparative cross-sectional study was approved by the Florida International University’s IRB. Between January 2018 and October 2018, health screening participants provided verbal consent, consistent with IRB-approved informed consent procedures, to collect data for analysis on their screening results. Included on those results was data on participants’ blood pressure, blood glucose, body mass index, body fat percentage, insurance status and access to a primary care physician (PCP). MedSWISH’s community activities are funded by the Office of Student Affairs at FIU HWCOM. Any additional funding was required to conduct this study. A team of medical students, supervised by an FIU HWCOM physician, attended 10 community health and wellness events between January 2018 and October 2018. There, they provided all willing adults with health screenings on their body mass index (BMI), body fat percentage, blood pressure, and blood glucose. This study was approved by the IRB of the Medical University of South Carolina. All the medical students in attendance were volunteers who had been trained by MedSWISH on the proper technique to measure BMI, body fat percentage, blood pressure and blood glucose.

The factors that influence patient health and wellbeing are multifactorial in nature. However, studies have shown a strong relationship between a lack of access to health care and the prevalence of chronic disease.1 According to a study using the National Health and Nutrition Examination Survey, between 1999-2004, over eleven million patients who suffered from chronic illness and uncontrolled diabetes, can each increase the risk of developing a myocardial infarction, stroke, visual impairment, renal impairment and heart failure.2–4 Studies have shown that continuity of care plays an important role in improving both patient outcomes and satisfaction.1 The impact of continuous care was found to be even more pronounced in patients suffering with a chronic illness.2 Access to long-term care alongside prevention and management of chronic disease can reduce the risk of these long-term effects and thereby improve patient outcomes.9

Access to affordable health care is one of the greatest factors that contribute to health disparities in America.10 According to the United States Census Bureau, 19.4% of the population in Miami-Dade under the age of 65 was uninsured in 2016.6 Medical Students Working to Improve Society and Health (MedSWISH), is a student run organization from FIU HWCOM that strives to close this gap. Students in MedSWISH provide free health screenings and education to community members at different health events in Miami-Dade County, such as health fairs, farmers markets and parades. If barriers to access to health care are identified, participants are referred to local organizations that can provide them with long-term care. By offering body mass index (BMI), body fat percentage, blood pressure, and blood glucose screenings, MedSWISH aims to increase awareness of personal health indicators as well as to educate participants on lifestyle modifications that could improve their overall well-being and health. MedSWISH volunteers work alongside other medical student organizations to educate participants on exercise, diet, smoking cessation, mindfulness, stress awareness, and cancer screening awareness. The goal of this organization is to decrease adverse outcomes such as myocardial infarction, stroke, heart failure, and renal disease by focusing on screening and education for chronic illnesses that serve as risk factors, such as diabetes mellitus, obesity and hypertension.1,5 MedSWISH strives to increase access to health care in our most vulnerable areas, which are defined by the Neighborhood Health Education and Learning Program (NeighborhoodHELP), by connecting health event participants with local resources in order to improve their health outcomes.11,12 NeighborhoodHELP is a program offered by the Florida International University, Herbert Wertheim College of Medicine (FIU HWCOM). Through the NeighborhoodHELP program, patients are provided the opportunity to have long-term access to care.11,13 Health disparities persist, resulting in medicine’s renewed emphasis on the social determinants of health and calls for reform in medical education.14 APPROACH The Green Family Foundation Neighborhood Health Education Learning Program (NeighborhoodHELP Members that are enrolled in the program may be assigned to a diverse team composed of a medical student, a physician assistant student, a social work student, a law student and a nursing student. Every household team is supervised by a licensed physician and supported by an outreach worker, in order to aid in improving the clinical and social needs of the households.11 NeighborhoodHELP patients have access to health, education, and social work services, which work to address and alleviate the determinants of health that can act as barriers for patients to receive care. Long-term care is available through household visits and the Mobile Health Center a mobile clinic that provides patients with free medical care by FIU HWCOM health professionals.

Conclusion: This preliminary analysis provided valuable insight as to the characteristics of participants that attend MedSWISH health events. Though much more research is needed to fully understand the characteristics of the different populations, this research is integral in MedSWISH’s mission to improve and individualize the services provided at the health events.

Key Words: MedSWISH, Medical Student, Health Fair, Community Outreach
Dade County. The events were organized by roman numerals I - X, in the order in which they were attended in 2018. The descriptive analysis of the participants’ data was assessed using SPSS version 23. Frequencies and central tendencies of the participants data were compared to that of the average population in Miami-Dade County quick facts, population estimates as of July 1st, 2017. Data was taken from Miami Matter’s project from the Health Council of South Florida.

For each metric collected, there was a significant difference in the results between individual events (Table 3). There was a lower percentage of female participants in events II and VI compared to the other fairs (P = 0.016). The percent of uninsured participants was 28.3%. The highest prevalence of insurance was in event I, II, III and V (P = 0.07). The percentage of people who lacked a PCP was 27.3%. A higher percentage of participants had access to a PCP in events I, II and III compared to the other health events (P = 0.012). The average BMI of the total sample was 29.4 (SD = 6). Event V had the lowest rate of obesity compared to event I, IV, IX and X (P = 0.007). Event I, III, IV, IX and X had the highest percentage of participants in the hypertensive range (P=0.003). Finally, 13.0% of the sample’s blood sugar readings fell within the diabetic range. Event X had the highest prevalence of participants with a blood sugar reading in the diabetic range. On the other hand, health events II, V, VI and VIII had the lowest prevalence of participants with a blood glucose reading in the diabetic range (P = 0.009).

Discussion

This study aimed to describe the different health fair participants who received health screenings by health event. The goal of this...
study was to use the data collected to better characterize the population seen, so as to tailor MedSWISH’s services to match each community’s needs. A significant difference was found between health events in terms of age, gender, ethnicity, BMI, blood pressure, insurance and PCP rate. The pattern of these differences was consistent throughout the different metrics measured, with events I, II and III having consistently better access to healthcare in terms of health insurance and access to a PCP. On the other hand, events V, VI and VII had the highest prevalence of participants with a blood pressure reading in the hypertensive range. On the other hand, fairs I, IV, V and X had the highest rate of participants with blood sugar readings in the diabetic range. The pattern seen at different events might be due to several factors, including the social determinants of health affecting the respective communities, the methods used to advertise the event, and the specific resources and incentives made available to participants by the organizing body. These differences could have resulted in an inherent preference of sicker or healthier participants presenting to the respective events.

The people that attended health events V, VI and VII had lower readings in terms of BMI, blood pressure and blood sugar; this does not take away from the importance of these health events in their communities. These same locations still suffered from a relative lack of access to health care, emphasized by the elevated number of participants without insurance or a primary care physician. This lack of longitudinal care predisposes these participants to worsened health outcomes and a potential increased utilization of emergency services as mode of primary care.14 An increased focus by MedSWISH on ways to increase access to care is warranted.

This data though preliminary, has brought valuable insight as to the population that attended different health events in which MedSWISH was present. Based on this analysis, MedSWISH will plan to tailor the services provided at different health events, to improve its ability to meet the anticipated needs of the respective communities. For example, the data collected from event II reveals an elevated prevalence of participants in the obese, as well as the hypertensive range. Interestingly however, none of the participants screened for this same event had a blood sugar reading that fell within the diabetic range. These important differences provide MedSWISH the opportunity to focus on interventions for blood pressure and obesity in the future. Interventions may include more frequent education and evidence based dieting programs such as the DASH diet, presentations on ways to lead a more active lifestyle, informational sessions on the risks associated with obesity and hypertension, and information on local pharmacies with discounted prices for blood pressure medications.17

This study has several limitations. First, many participants, though diagnosed with hypertension or diabetes, had their metrics well controlled with medication. This, compounded by the fact that only one time point was taken per participant, limited the study’s ability to capture the prevalence of hypertension and diabetes in the study population. Second, ethnicity data in three health events were not collected, which might have skewed the population average for that metric. Third, data on the participant’s race and ethnicity was not collected separately, which could have clouded this study’s ability to better characterize the population seen. Finally, the only patient health information (PHI) collected was zip code, making it impossible to ascertain whether any of the data points belonged to the same participant.

Conclusion

This study is an interim analysis, characterizing the health metrics of the populations screened at MedSWISH health events between January and October 2018. The results of this study will be used to guide the services that the organization provides at future health events. Event volunteers will be advised on the specific comorbidities present at each event and will be provided with community specific resources to help them better individualize their care and education to each participant. MedSWISH plans to expand this study to include a larger number of participants and health events. MedSWISH will also begin to collect additional variables, including race, smoking history, personal history of diabetes as well as hypertension, and information on local pharmacies with discounted prices for blood pressure medications.17

References


Access the full text of this article at www.ama-assn.org/dash/ar/news/examining-tea-and-blood-pressure
Ethnic Disparities and Chest X-rays in the Emergency Department

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Abstract

Introduction: Community acquired pneumonia (CAP) is a common cause of hospital admission for pediatric patients. Evidence of racial disparities were reported for the diagnosis and management of CAP in pediatric patients in the Emergency Department (ED). We investigated whether Hispanic/Latino pediatric patients presenting to the ED throughout the United States with a differential of pneumonia received different diagnostic care when compared to non-Hispanic/Latino patients.

Methods: Secondary data analyses were conducted using the National Hospital Ambulatory Medical Care Surveys from 2009 to 2014. Pediatric (ages 1-17) ED visits including “pneumonia” in the diagnosis were analyzed using ICD-9 codes 480 through 487. The outcome was receiving a Chest X-Ray (CXR), and the independent variable was ethnicity (being Hispanic or Latino vs. non-Hispanic and non-Latino). Multivariate logistic regression was used to assess independent associations of ethnicity with performance of a CXR. Sensitivity analyses were conducted to account for missing data on ethnicity, age, race, or insurance.

Results: 587 pediatric patients with a differential diagnosis including pneumonia and were included in the study. Hispanic/Latino patients appear to be slightly less likely to receive a CXR when compared to their Non-Hispanic/Latino counterparts, yet results were not significant [unadjusted odds ratio (OR) 0.8, 95% Confidence Interval (CI) 0.3-1.9, p=0.600]. After adjusting for age, gender, race, location, and insurance type, the association remained not significant (OR=0.8, 95% CI 0.3-2.5, p=0.744).

Conclusions: We fail to find evidence for disparities in the use of CXR for diagnosis of pneumonia for Hispanic/Latino patients presenting to the ED with symptoms of pneumonia. However, power limitations might have contributed to these results. Further research is warranted.

Keywords: pneumonia, disparity, emergency, CXR, chest X-ray, pediatrics

Introduction

Community acquired pneumonia (CAP) is a common cause of hospital admission for pediatric patients, and it is still an important cause of morbidity in children even in developed countries. Diagnosis and management of pediatric CAP in the Emergency Department (ED) presents multiple challenges, including providing the efficient, cost-effective use of diagnostic tests, and selecting the appropriate treatment. Due to these challenges, the World Health Organization (WHO), British Thoracic Society (BTS) and other health organizations have developed guidelines to help healthcare and non-healthcare personnel in the caring for pediatric patients presenting with pneumonia-like symptoms. Particularly, diagnosis and management of CAP in pediatric patients who present to outpatient settings such as the Emergency Department (ED) presents multiple challenges, including the efficient and cost-effective use of diagnostic tests and treatment for the appropriate causal pathogen.

In the developed world, chest X-rays (CXR) are considered the standard diagnostic test for pneumonia in adults. However, the use of CXR for diagnosing pneumonia in children tends to be more conservative to reduce the lifetime exposure of children to radiation. Diagnosis depends on clinical presentation and physical examination. In the past decade, the WHO and other health organizations have developed guidelines to aim doctors in making the right decisions in choosing diagnostic tests and treatment options. Some of these guidelines are targeted for pediatric patients presenting with pneumonia symptoms in the inpatient and outpatient settings. However, disparities in the utilization of these guidelines were reported among different ethnic groups. Recent studies have shown that there are disparities in the effectiveness of healthcare received by ethnic populations, such as blacks and Hispanics, leading to economically inefficient healthcare.

Assuming that adherence to established guidelines is considered a marker of adequate quality of care, we aimed to identify whether health care disparities existed among Hispanic/Latino and non-Hispanic/non-Latino pediatric patients when providing care for lower respiratory infections, particularly CAP. Being able to understand and identify potential racial and ethnic disparities could
help in the design of policies to decrease healthcare disparities and improve childhood health.

Methods

Design

We performed a secondary analysis of data from participants of the National Hospital Ambulatory Medical Care Survey (NHAMCIS) from 2009 to 2015. The NHAMCIS survey collects data on ambulatory care services in hospital emergency and outpatient departments, and in ambulatory surgery centers annually since 1992. Trained interviewers visited every location prior to participation to describe survey procedures and obtain eligibility. Each location was randomly assigned to a 4-week reporting period.

Sample Selection

The target population was all patients less than 18 years old that presented to the emergency department with suspicion of pneumonia. We made an assumption that neonates or premature infants would present less often to the emergency room, and instead may remain in the hospital from birth; additionally, the sample size of this subgroup was likely to be small. As such, we did not deem it necessary to exclude patients less than 1 month of age.

To identify patients that presented with suspicion of pneumonia, we used an expanded inclusion criteria of “cough” as a presenting symptom, rather than differential diagnosis of pneumonia, to capture additional cases where CXRs were ordered based on initial symptom, rather than differential diagnosis of pneumonia, to capture additional cases where CXRs were ordered based on initial presentation.

Variables

To determine differences in quality care by ethnicity, our independent variable was the patients’ ethnicity (Hispanic/Latino and Non-Hispanic/Latino) as self-reported. Our dependent variable was whether or not patients received a chest X-ray during the visit. The target population was all patients less than 18 years old that presented to the emergency department with suspicion of pneumonia, as recorded in the survey.

Potential confounders were the child’s age at the time of visit (less than 1 year, between 1 and 4 years, and above 4 years), race (“White”, “Black/African American”, or “Other”), gender, region of residence (“Northeast”, “Midwest”, “South”, and “West”), insurance type (“Private”, “Government”, “No insurance”, or “Other”), presence of hypoxemia (measured by pulse oximetry and categorized as <93% and ≥93%), of chest X-rays during the visit in the ED. All variables were categorical, thus, chi-squared tests were used to assess statistical significance. Lastly, multivariate logistic regression analyses were used to assess the association between ethnicity and use of CXR while adjusting for potential confounders.

A number of patients in the study did not have information for ethnicity, the main exposure in our study, so they were excluded for the purpose of the primary analysis. Later we conducted a sensitivity analysis to determine if the results were robust, considering cases without data on ethnicity first as Hispanic/Latino and later as Non-Hispanic/Latino. We also conducted an analysis using an expanded inclusion criteria of “cough” as a presenting symptom, rather than differential diagnosis of pneumonia, to capture additional cases where CXRs were ordered based on initial presentation.

This study was based on analysis of de-identified data, thus, the IRB considered the study to be non-human subject research.

Results

Over the 6-year window of 2009 through 2015, 587 pediatric patients met the criteria of this study. Table 1 presents the characteristics of the sample. Hispanic/Latino patients predominately identified as White (95.4%), were more likely to be located in the South (38.4%) and Western (38.4%) regions of the United States. They were also significantly more likely to have government insurance (80.6%) as opposed to private insurance when compared to their Non-Hispanic/Latino counterparts.

Table 2 shows the characteristics of subjects as it pertains to usage of chest X-rays during the same visits. Hispanic/Latino patients were slightly less likely to receive chest X-rays (80.8%) when compared to their Non-Hispanic/Latino counterparts (84.1%); however, this was not statistically significant. Age was the only baseline feature that showed a significant association with the use of X-rays, with younger patients having CXR less often than older children.
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</table>

Table 2. Characteristics of pediatric patients presenting to the emergency department by use of chest X-Ray, NHAMCS 2009-2014.
One hundred-twenty eight patients in the study did not have the use of X-rays. Location, and insurance type did not yield significant differences on chest X-rays (adjusted OR 0.3; 95% CI 0.1 to 0.6). Gender, race, and without information about ethnicity and sensitivity analysis with expanded inclusion criteria

Table 4. Association between ethnicity (Hispanic/Latino vs Non-Hispanic/Latino) and use of X-rays - Sensitivity analysis for patients with and without information about ethnicity and sensitivity analysis with expanded inclusion criteria

<table>
<thead>
<tr>
<th>Patients</th>
<th>Unadjusted OR (95% CI)</th>
<th>p-value</th>
<th>Adjusted OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only those with data on Ethnicity</td>
<td>0.8 (0.3-1.9)</td>
<td>0.600</td>
<td>0.9 (0.3-2.6)</td>
<td>0.857</td>
</tr>
<tr>
<td>Counting all missing as Hispanic/Latino</td>
<td>0.8 (0.4-1.6)</td>
<td>0.502</td>
<td>1.0 (0.4-2.7)</td>
<td>0.921</td>
</tr>
<tr>
<td>Counting all missing as Non-Hispanic/Latino</td>
<td>0.9 (0.4-2.0)</td>
<td>0.710</td>
<td>0.7 (0.2-1.9)</td>
<td>0.455</td>
</tr>
</tbody>
</table>

1 Adjusted for, age, region, severity and health insurance

Discussion

In this study, Hispanic/Latino ethnicity was not found to be significantly associated with a decreased quality of care in the ED diagnostic evaluation of pediatric pneumonia. Our findings are not in agreement with previous studies that found health care disparities in pediatric ED patients presenting with pain, asthma, or other conditions. Additionally, Jones et al. studied asthma pediatric patients in the ED and found that African Americans and Hispanics were 80 and 70% more likely to have used urgent care, respectively, compared to their Caucasian counterparts. Factors contributing to seeking urgent care include trouble getting care before the ED, symptom severity, and Medicaid enrollment. Guidelines are published on the management of CAP in children 3 months and older. Specifically, decisions on CXRs are based on signs of respiratory distress, including tachypnea, dyspnea, retractions, grunting, apnea, altered mental status, and pulse oximetry on room air. These guidelines are intended to make healthcare decisions non-biased, however, ordering CXRs or further tests are the decision of the healthcare provider and can be subjective. Although our study did not find an association between ethnicity and disparities in the pediatric population, Washington et al. found variation in patterns of care among different US ethnic/racial pediatric patients with pneumonia. For example, minorities African Americans, Hispanics, and Asian) were less likely to receive bronchoscopy or mechanical ventilation, as well as incurred higher charges during their stay in the hospital.

We further decided to investigate our inclusion criteria. We included patients based on differential diagnosis of pneumonia via ICD-9 codes. Other may have had CXRs ordered based on presenting symptoms even if pneumonia diagnosis was not provided, which may have narrowed the subset of our intended population. When we conducted an additional analysis to consider a presenting symptom of “cough” as the inclusion criteria, our results differed in terms of sample size and significance, while the odds ratio stayed the same. This suggests that an association may exist, yet we did not have enough power in the initial analysis to verify it. A possible limitation in our study design is the adjustment for triage level to classify severity of pneumonia symptoms. It is possible the triage staff had racial or ethnicity-related bias. A study of 78 million adult ED visits using NHAMCS found that Caucasians with chest pain were more likely to be triaged emergently than African Americans and Hispanics. If Caucasian patients in our study were appropriately assigned more urgent triage scores, our study results could underestimate the association between ethnicity and quality of care of pediatric pneumonia.

Another limitation of our study is the inability to explore English proficiency as a potential confounder. Language preference was not included in the NHAMCS surveys used, which may underestimate the association between ethnicity and quality of care. Finally, some hospitals may rely on self-reporting of race and ethnicity. Staff may assume a child or family is non-Hispanic if they are fluent English speakers. Inconsistent staff assignment of race and ethnicity could subject the study to misclassification bias, which could lead to falsely finding a lack of association.

While this study did not find an association between ethnicity and the management of pneumonia in pediatric ED patients, studies of other health problems documented clinically significant disparities. Additional research is necessary to investigate the circumstances where disparities exist, with the goal of improving patient care in vulnerable populations.

References


A case report of dizygotic twin pregnancy concordant for non-syndromic cleft lip and palate with differing severity

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Abstract

Introduction: Oral clefts are among the most common congenital malformations in the United States. The literature regarding oral clefts in twin gestations is limited. Concordance rates for cleft lip and palate in monozygotic and dizygotic twins have been reported in the literature, demonstrating 50% vs 8%, respectively. In this report, we present the case of a di-miotic, dichorionic twin gestation of male fetuses identified by ultrasound to have cleft lip (Baby A) and cleft lip and palate (Baby B).

Objective: To describe a unique case, in the absence of risk factors, of di-miotic, dichorionic twins discordant for non-syndromic CL and CLP of differing severity.

Conclusions: With a multifactorial inheritance pattern, the etiology of this non-syndromic malformation may be due to unidentified genetic causes or environmental causes affecting the shared intrauterine environment of twin gestations. There is no increased risk of oral cleft associated for twins when compared to singletons. As in this case, early detection of this congenital malformation enables providers to adequately organize appropriate and specialized care for the duration of the gestation and for future surgical correction.

Key Words: oral clefts; cleft lip; palate; di-miotic twins; intrauterine diagnosis

Introduction

Non-syndromic orofacial clefts are among the most common congenital malformations.1 Orofacial clefts may be divided into three distinct phenotypes: cleft lip (CL), cleft palate (CP) and cleft lip and palate (CLP).2,3 Prevalence has also been shown to increase with maternal age.4-6

Diagnosis of this congenital defect can be made during pregnancy via routine ultrasound or upon delivery and inspection of the newborn. Those affected initially face difficulties with feeding and will ultimately require multiple corrective surgical procedures. Despite surgical correction, patients may continue to face clinical problems related to speech, hearing, and identity that require additional therapy.7-9 It is important to identify these congenital malformations as early as possible to provide the opportunity to plan surgical correction and identify a syndromic etiology if present. While the literature provides information regarding oral clefts, studies concerning the risk of oral clefts in twins are limited due to small sample sizes. The purpose of this article is to describe a unique case, in the absence of the aforementioned risk factors, of di-miotic, dichorionic twins discordant for non-syndromic cleft lip and palate with differing severity.

Case

A 33 year old gravida 3 para 1011 female with no significant past medical history presented for routine obstetrical care of a twin gestation conceived through in vitro fertilization (IVF) with preimplantation genetic screening. Other genetic testing included a karyotype of the patient demonstrating a 46, XX female with no chromosomal abnormalities identified. IVF was considered for this pregnancy due to male factor infertility of the partner. Testing during the pregnancy included first and second trimester screening tests for aneuploidy and neural tube defects, all of which were negative. Routine anatomical survey performed at 19 weeks gestation demonstrated a di-miotic, dichorionic twin pregnancy with no significant discordance. A cleft lip was identified in both twin A and two and three weeks later, a cleft palate appearing to extend into the palate. The remainder of the fetal anatomy ultrasound (US) identified no other anomalies. The patient’s history identified no risk factors such as family history of cleft lip, cleft palate, or other birth defects. Both partners denied history of tobacco, alcohol, or substance use.

Failure of fusion of the two palatal shelves along the midline results in a cleft palate.10

While there are several theories for the etiology of orofacial clefts, among most infants the cause remains unknown. Studies have indicated that the etiology is multifactorial, including both genetic and environmental causes.11 A genetic etiology for this congenital malformation was first suggested by Fogh-Anderson in 1942, as there was an increased frequency of cleft noted in relatives of patients with an orofacial cleft.12 To date, the genetic cause of non-syndromic cleft lip with or without cleft palate has not been fully identified. Progress continues to be made in identifying the genes and how they potentially affect these birth defects. Historically, interferon regulatory factor 6 (IRF6) was identified as the first causal gene for true nonsyndromic cleft lip with or without cleft palate.13 More recently, a comprehensive review of the genetics of orofacial clefting by Mangold et al. discusses the introduction of genome-wide association studies (GWAS) and the exploration of genetic loci possibly responsible for nonsyndromic orofacial clefts. There have been nine independent GWAS and two meta-analyses that have identified at least 25 genetic loci that contribute to the risk of orofacial clefts.14 Proof of causality is still ultimately lacking, propagating the need for further investigation. Environmental risk factors associated with increased risks of isolated cleft lip and palate include maternal cigarette smoking, alcohol consumption, medication use, and folate deficiency.15-17

As mentioned previously, males demonstrate a higher prevalence of cleft lip with or without cleft palate. This apparent sexual dimorphism has been explored via a genome wide interaction study in the attempt to identify sex-specific risk alleles for non-syndromic orofacial clefts. The results of this study supported observed dimorphism by finding a novel locus 10q21.1 with a genome-wide significant gene by sex interaction for multiple single nucleotide polymorphisms.18 Data regarding twins and the association to orofacial clefts is limited. Studies in the past have suggested a possible relationship between twinning and increased risk of oral clefts. However, a more recent study exploring the risk of oral clefts in twins by Grosen et al. suggested that there is no excess risk of oral clefts for twins compared to singletons.19 This cohort study compared the oral cleft occurrence among singletons and twins using a 69-year Danish nationwide registry of isolated oral clefts.20 Concordance rates for cleft lip and palate for monozygotic and dizygotic twins were identified demonstrating 50% vs 8%, respectively. Despite these results suggesting a strong genetic etiology, the incomplete concordance among monozygotic twins supports the theory that twins, with their shared genetic makeup, are not always affected.21 In regards to dizygotic twins, recurrence risks among these types of clefts was demonstrated to be greater in dizygotic twins than non-twin siblings.22 This finding was postulated to be the result of a shared intrauterine environment.
Baby B – Unilateral Cleft Lip and Palate

2D tranabdominal ultrasound transverse view of upper lip and hard palate in Baby B. Figure 2C: 2D tranabdominal ultrasonography depicting profile of Baby B. Figure 2E: 3D tranabdominal ultrasonography at 26w6d demonstrating unilateral cleft lip in Baby B.

Baby A – Bilateral Cleft Lip and Palate

Figure 1A: Baby A with bilateral cleft lip and palate. Figure 1B: Both, 2D tranabdominal ultrasound demonstrating coronal view of lips and nose. Imaging significant for bilateral cleft lip in Baby A. Figure 1C: 2D tranabdominal ultrasound transverse view of upper lip and hard palate in Baby A. Figure 1D: 2D tranabdominal ultrasonography depicting profile of Baby A. Figure 1E: 3D tranabdominal ultrasonography at 26w6d demonstrating bilateral cleft lip in Baby A.

Assessment and treatment requires planning and coordination among an interdisciplinary team of specialists dedicated to the treatment of congenital anomalies. Wide use of routine ultrasonographic screenings can identify congenital anomalies such as orofacial clefts in utero. Despite the advancements in ultrasonography its accuracy at times may be limited. The sensitivity of routine transabdominal ultrasound at 20 weeks gestation may vary from 16% to 93%.12 The variation in sensitivity may result from several factors such as experience of the ultrasonographer, maternal body habitus, fetal position, amount of amniotic fluid, and type of cleft.13 When the diagnosis is made in utero, early access to prenatal coordination of care may be established. An accurate prenatal diagnosis ensures proper counseling with the parents when discussing prognosis and surgical planning.

Initial evaluation of the child is recommended within the first few days of life with attention focused on feeding and breathing. Those with palatal clefts cannot generate negative pressure while suckling.14 As a result, a specialized nurser is needed to dispense milk into their mouths. Once adequate feeding and breathing are ensured, subsequent interval evaluations are conducted in order to assess the extent of the cleft anomaly and plan for surgical repair. In order to prepare for the first surgery at 3 to 6 months of age, attempts are made to reduce the deformity via a process known as pre-surgical infant orthopedics.15 This serves to enhance the position of the maxillary alveolar segments.16 It may also improve the nasolabial aesthetic outcomes prior to surgical closure of the cleft lip in some infants.17 The goals of repair differ depending on the severity of the cleft malformation. For cleft lip, restoring normal function and anatomy is sufficient. For those with cleft palate, the goals of repair are slightly different as it aims to achieve normal function for speech and swallow.18

Conclusion

This case described a rare incidence of dizygotic twins identified in utero concordant for an orofacial cleft malformation with differing severities: unilateral cleft lip (Baby A) and bilateral cleft lip and palate (Baby B). While it is well known that oral clefts such as cleft lip and palate are among the most common congenital malformations, there is a paucity of information available regarding its association among dizygotic twins. Thus far, the literature fails to demonstrate an increased risk of oral cleft associated for twins differing severities: unilateral cleft lip (Baby A) and bilateral cleft lip and palate (Baby B). While it is well known that oral clefts such as cleft lip and palate can are among the most common congenital malformations, there is a paucity of information available regarding its association among dizygotic twins. Thus far, the literature fails to demonstrate an increased risk of oral cleft associated for twins differing severities: unilateral cleft lip (Baby A) and bilateral cleft lip and palate (Baby B). While it is well known that oral clefts such as cleft lip and palate can...
Go With the Flow: A Case Report of Trans-Transjugular Intrahepatic Portosystemic Shunt (TIPS) Complete Esophageal Variceal Embolization Using Liquid Embolic n-Butyl Cyanoacrylate Glue (nBCA)

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Abstract
Introduction: Variceal embolization during trans-jugular intrahepatic portosystemic shunt (TIPS) placement reduces the rate of post-TIPS hemorrhage. Embolic agents used for variceal embolization include metal coils or detachable plugs with or without additional sclerosing agents; however, these methods can result in lengthy procedural time and incomplete embolization. n-Butyl Cyanoacrylate (nBCA) glue, however, is a liquid embolic agent approved for the treatment of arteriovenous malformations. We present a case where post-TIPS nBCA embolization of extensive esophageal varices was performed using nBCA glue.

Methods: A 28-year-old male with alcoholic cirrhosis presented with bleeding esophageal varices refractory to repeat endoscopic interventions. Interventional Radiology consulted for TIPS placement. Persistent filling of an extensive esophageal variceal complex was noted after TIPS placement, despite a decrease in portosystemic gradient. Trans-TIPS access was obtained very distally into the variceal complex. A 1:2 nBCA: lipiodol glue mixture was instilled as the catheter was withdrawn back to the feeding left gastric vein achieving immediate, complete embolization of the entire extensive variceal complex.

Results: Successful TIPS with immediate, complete embolization of the entire esophageal variceal complex was obtained using nBCA glue.

Discussion/Conclusion: Post-TIPS variceal embolization with nBCA glue provided a highly controllable way to achieve immediate, complete cast-like embolization of extensive variceal complexes.

Keywords: Hemorrhage, n-BCA, TIPS, UGI Bleeding, Varices

Introduction
Transjugular intrahepatic portosystemic shunt (TIPS) creation is often successfully used to treat portal hypertension and its complications, including gastrointestinal variceal hemorrhage refractory to medical or endoscopic management. TIPS has been shown to be effective in lowering portal pressures and in the setting of variceal bleeding, embolization of varices during TIPS placement has been shown to reduce the rate of post-TIPS hemorrhage. Embolic agents typically used for variceal embolization include metal coils or detachable plugs with or without additional sclerosing agents; however, these methods can result in lengthy procedural time, increased cost, and increased radiation exposure with potentially incomplete variceal embolization.

n-Butyl Cyanoacrylate (nBCA) glue is a liquid embolic agent approved for the treatment of arteriovenous malformations. It is radio-opaque when mixed with lipiodol. The extent of embolization can be predicted based on vessel flow and glue polymerization rates. In experienced hands, glue embolization can be precisely deployed to create a complete plug of the target vessel, decreasing non-target embolization while conforming to the vessel framework. Because of its liquid nature, nBCA glue embolization is particularly useful in the setting of coagulopathy as it is not reliant on intact coagulation cascade to obtain occlusion. It has been shown to be effective in failed coil embolization.

Therefore, nBCA glue can provide a highly controllable way to achieve immediate, complete cast-like embolization of extensive variceal complexes. We present a case where post-TIPS nBCA embolization of extensive esophageal varices was performed resulting in immediate embolization of the entire variceal complex.

Case Presentation
A 28-year-old male with history of alcoholic cirrhosis and family history of cirrhosis (MELD 14; Child Pugh Class B) presented to our institution with hematemesis. On first admission, bedside esophagogastroduodenoscopy (EGD) was performed with banding of grade 3 esophageal varices.

Two days after discharge, the patient represented with recurrent hematemesis and underwent repeat EGD by gastroenterology with unsuccessful banding and sclerosis of the variceal complex.

A computed tomography (CT) scan demonstrated extensive esophageal and gastric varices, but no clear gastro-splenoportal shunt (Figure 1). Interventional radiology was consulted, and the patient was deemed a candidate for TIPS.

Figure 1: Axial contrast-enhanced CT image demonstrated sequela of portal hypertension with recanalized umbilical vein (white arrow) and a large gastroesophageal variceal complex (blue arrowheads).

Procedure
TIPS Creation:
A pre-TIPS portal venogram demonstrated contrast filling the extensive gastroesophageal variceal complex (Figure 2A). The right hepatic vein was catheterized via right internal jugular vein access. The portosystemic gradient was 14 mmHg. A right hepatic vein a right portal vein TIPS was created via right internal jugular vein access with 8-10 x 8 x 2 cm Viatorr stent graft deployed to 8mm, with a post TIPS portosystemic gradient of 10 mmHg.

Variceal Catheterization:
A portal venogram demonstrated persistent flow through an extensive gastroesophageal variceal complex. A 5 Fr 100cm angled glide catheter was used to select the left gastric vein. A 0.016” Fathom wire (Boston Scientific, Marlborough, MA) and a 2.4 Fr Progreat microcatheter (Terumo, Japan) were passed deep into the extensive, tortuous variceal complex.

Glue Embolization:
The glue mixture was prepared in a 1:2 nBCA: lipiodol ratio mixture (TRUFILL, DePuy Synthes, West Chester, PA). 3 mL of D5W were used to flush the microcatheter of ionic substances (blood, saline) to prevent intra-catheter glue polymerization. 1mL of glue mixture was then flushed through the microcatheter and a glue plug was allowed to form into a plug at the tip of the catheter to occlude the variceal outflow.

As the catheter was slowly withdrawn through the variceal complex feeding the left gastric vein, another 1mL of glue mixture was injected into the variceal complex. Once the feeding left gastric vein was reached, the catheter was flushed multiple times with...
Completion venography demonstrated no further variceal filling with complete cast-like embolization of the esophageal varices with a portosystemic gradient of 10 mmHg (Figure 2B). A post-procedural coronal CT image demonstrated the TIPS in place with the lipiodol: nBCA glue cast filling the gastroesophageal variceal complex (Figure 3).

POST-PROCEDURE:

The patient tolerated the procedure well and was normotensive and hemodynamically stable after receiving 8 units of packed red blood cells and 2 units of fresh frozen plasma. He was subsequently transferred to the medical floor. The patient’s hemoglobin began to drop and he became hypotensive, so he was transfused with an additional unit of packed red blood cells and fluid boluses and responded well. He did not have any signs of active bleeding. He also spiked low grade fevers and was tachycardic but no drainable ascitic fluid was found. He received intravenous antibiotics and his tachycardia resolved. After 24 hours of intravenous antibiotics, the patient remained afebrile, normotensive, and hemodynamically stable, his heart rate normalized, and he did not display any signs of active bleeding. He was discharged on postoperative day 5 and was referred to hepatology for further follow up.

Figure 3: Post procedural coronal CT image demonstrates TIPS in place (blue arrow) with lipiodol: nBCA glue cast filling the gastroesophageal variceal complex (white arrows).

Discussion

The mortality rate of acute variceal bleeding in cirrhotic patients has been estimated to be 15-20% during the first year.4 This high mortality rate associated with variceal hemorrhage makes preoperative planning for maximizing therapy outcome imperative. Tesdal et al. compared TIPS alone and TIPS with adjunctive embolotherapy. After a mean follow-up time of 48.7 months, they found that 61% of patients with TIPS remained free of bleeding after 2 years and 53% after 4 years compared to 84% and 81% in patients who underwent both TIPS and embolotherapy.5

Additionally, a meta-analysis conducted by Qi et al. found a significantly lower rate of rebleeding in adjunctive embolotherapy amongst six studies. They did, however, indicate the need for additional randomized controlled trials.6 These findings suggest that adjunctive embolotherapy lowers the rate of rebleeding, and thus patient mortality.6

Classic use of nBCA in cerebral arteriovenous malformations10 and pseudoaneurysms11 has proven useful. Additionally, sclerotherapy with nBCA has been shown to be safe and effective in the control of bleeding and eradication of gastric varices11. Yi-Hsiu et al. evaluated the long-term efficacy and safety of endoscopic treatment of bleeding gastric varices with nBCA. The rate of hemostasis at one week was 94.4% and the rate of definitive hemostasis was 93.3% with minimal long term complications, such as mucosal defects; indicating that nBCA is highly effective without notable consequential complications.11

In addition, nBCA has proven its high efficacy profile providing hemostasis of arterial bleeding when previous coil or particulate embolization has failed in complex patients.12 like the case we presented here.

nBCA’s success is partially due to its viscosity, which allows for the cast-like embozilation, and its polymerization speed, which does not allow it to permeate to the capillary level.13 Its dense radiopacity allows for precise embozilation to be observed in real time by the operator.

Given the importance of post-TIPS variceal embolization due to the high mortality associated with hemorrhage, the effectiveness of adjunctive embolotherapy is vital. The safety, effectiveness, and shorter treatment time of nBCA makes it an optimal, perhaps, superior embolic choice for post-TIPS embolotherapy. It offers the intervensionalist a powerful lifesaving agent in their arsenal to treat and decrease the mortality of these complex, sick patients.

Conclusion

In the presented case, post TIPS nBCA embolization of extensive esophageal varices was performed. This resulted in immediate, precise embozilation of the esophageal variceal complex, providing a controllable and time effective treatment. We propose it should be considered in preoperative planning for all hemorrhagic etiologies, whether elective or emergent.

References

CASE REPORT

A Case of Endovascular Management of Nutcracker Syndrome Presenting as Spontaneous Left Renal Vein Thrombosis: A New Age Interventional Approach to a Classic Ballad

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Abstract

Introduction: Nutcracker syndrome (NCS) is a condition that occurs when the left renal vein (LRV) is compressed, most commonly between the aorta and the superior mesenteric artery (SMA). NCS can predispose a person to left renal vein thrombosis (RVT). We present a case where successful aspiration thrombectomy was performed using the Penumbra Indigo CAT8 system, a mechanical thrombectomy device that uses an 8F catheter, to treat RVT in a patient with NCS.

Methods: A 20-year-old female with a past medical history of systemic lupus erythematosus (SLE) and lupus nephritis presented to the emergency department with acute flank and abdominal pain. The ultrasonography was significant for proteinuria and hematuria. Contrast-enhanced CT of the abdomen and pelvis demonstrated isolated left RVT with compression of the vein between the SMA anteriorly and the aorta posteriorly, consistent with underlying NCS. Given the patient’s age and severe pain, the decision was made to undergo pharmacomechanical aspiration thrombectomy with the Penumbra Indigo CAT8 system. The procedure was completed successfully.

Discussion/Conclusion: Spontaneous isolated RVT is a rare initial presentation of underlying NCS. Through a review of the literature, we aim to review the pathophysiology of this condition. We also introduce our successful use of the Penumbra Indigo CAT8 system for pharmacomechanical aspiration thrombectomy, a novel endovascular treatment regimen of this clinical entity.

Keywords: Nutcracker, Thrombosis, Pharmacomechanical Thrombectomy

Introduction

Nutcracker syndrome (NCS) is a condition that occurs when the left renal vein (LRV) is compressed, most commonly between the aorta and the superior mesenteric artery (SMA). Without treatment, NCS can predispose a person to left renal vein thrombosis (RVT). Advances in biomedical engineering have expanded venous thromboembolism treatment beyond anticoagulation, specifically, catheter-directed pharmacologic thrombosis, mechanical and pharmacomechanical thrombectomy, and aspiration thrombectomy.

Pharmacomechanical thrombectomy involves the combination of direct infusion of lytic agents into the thrombus and removal of the clot with an endovascular mechanical device via maceration or aspiration. The Penumbra Indigo system for aspiration thrombectomy has catheter sizes of up to 8F. Power aspiration-based extraction of peripheral arterial thromboembolism with the Penumbra Indigo system has been shown to be safe and effective, both as a primary treatment and adjunctive therapy.

We present a case where successful aspiration thrombectomy was performed using the Penumbra Indigo CAT8 system, a mechanical thrombectomy device that uses an 8F catheter, to treat RVT in a patient with NCS.

Case Presentation

A 20-year-old female with a past medical history of systemic lupus erythematosus (SLE) complicated by lupus nephritis with no relevant family or social history presented to the emergency department with severe left flank and abdominal pain. Contrast enhanced CT of the abdomen and pelvis demonstrated compression of the LRV as it coursed between the SMA and the abdominal aorta. Delayed left nephrogram indicated the presence of a left RVT. These findings were consistent with NCS. Further, extension of the thrombus into the left gonadal vein was noted (Figure 1).

Interventional Radiology was consulted for further evaluation and intervention. Given the patient’s failed triple anticoagulation therapy, persistent severe pain, and signs of decreased renal perfusion on CT, the decision was made to perform a left renal venogram with possible LRV thrombolysis and possible stenting of the LRV.

Figure 1: Marked compression of the LRV (orange arrow) as it courses between the SMA (yellow arrow) and the abdominal aorta (aortomesenteric angle 40 degrees, beak angle of 47 degrees), with resultant thrombosis of the LRV (blue arrow). Delayed venous nephrogram (white arrow) is noted. A filling defect in the left gonadal vein indicating thrombosis is not pictured.

Procedure

A left renal venogram demonstrated an expanded thrombus in the LRV and filling of distal collateral venous channels (Figure 2A). The thrombus was laced with 10 mg of tissue plasminogen activator (tPA) and allowed to dwell for 10 minutes. Subsequently, the Penumbra Indigo CAT8 system was used to perform aspiration thrombectomy of the LRV. Post thrombectomy intravascular ultrasound (IVUS) showed minimal residual thrombus within the LRV and a left renal venogram showed markedly improved vessel caliber (Figure 2B). However, severe compression of the LRV as it passed between the SMA and aorta was noted, consistent with NCS.

A systolic pressure gradient of 4 mmHg was measured in the post-stenotic LRV (18/14 mmHg) and inferior vena cava (14/12 mmHg). Given the non-significant pressure gradient across the region of stenosis (4mmHg) and the patient’s young age, stent placement was deferred.

Post-operatively, the patient was started on Enoxaparin, a factor Xa inhibitor; and was switched to Apixaban, a different factor Xa inhibitor, for outpatient therapy.

Discussion

Similar to deep vein thrombosis or a pulmonary embolism, symptomatic RVT is initially treated with unfractionated or low molecular weight heparin (LMWH) followed by warfarin. A study by Wu et al. reports successful treatment of RVT with LMWH in 3 patients with nephrotic syndrome, highlighting its safety, efficacy profile, and feasibility for outpatient treatment. Lam et al. reported successful treatment of acute inferior vena cava thrombosis and unilateral RVT by local infusion of recombinant tPA. They recommend thrombolytic therapy as a second line treatment (after failed heparin therapy) in patients with bilateral involvement, acute renal failure, or severe flank pain, similar to our patient presentation. Percutaneous catheter-directed thrombectomy with or without fibrinolysis has been shown to restore renal function rapidly with a low incidence of morbidity due to pulmonary emboli or hemorrhagic complications in the treatment of RVT. Boosting the efficacy profile of percutaneous catheter directed thrombectomy, Kim et al. demonstrated no RVT recurrence after a median follow up time of 22.5 months.

With a rare presentation of “complicated” NCS, where left RVT occurs, invasive treatment is indicated in patients who fail medical therapy or with persistent recurrence to preserve renal function. Endovascular stenting of the LRV, transposition of the SMA or LRV, and autotransplantation of the left kidney have all been described as successful therapies with some literature recommending stenting as first line when clinically indicated.

Interventionalists, however, are reshaping traditional therapy. Based on the data above, treatment should first be initiated with anticoagulants, changing the site of coagulation cascade inhibition if therapy fails with subsequent targets being Vitamin K (Warfarin) and Factor Xa (Rivaroxaban). Angiography is considered for refractory cases with initial analysis encompassing pressure gradient measurements. Advancements in biomedical engineering have permitted venous thromboembolism disease to be treated with catheter directed thrombolysis and pharmacomechanical thrombectomy, with adjunct stenting when indicated. We suggest the use of IVUS for precise endoluminal assessment pre and post treatment. The Penumbra Indigo CAT8 aspiration system allows for single session, prompt thrombectomy, decreasing radiation, procedure time, and complications compared with traditional lytic therapy.

In the case presented, given the patient’s age, failed triple anticoagulation therapy, and considering thrombosis extension into the left gonadal vein, initial thrombolysis was performed, allowing for prompt and uncomplicated aspiration thrombectomy with no residual clot on IVUS. Adjunct stenting was not deemed necessary secondary to lack of a significant pressure gradient. Preventative treatment with Apixaban was initiated after the procedure with no evidence of recurrence to date.

Conclusion

Various thrombosis, a common disease elsewhere in the peripheral system, can present as a rare presentation of underlying NCS. The
Successful use of pharmacomechanical aspiration thrombectomy of the renal vein with the Penumbra Indigo CAT8 system allowed for optimal use of medical and minimally invasive therapy, placing the interventionist at the cusp of modern, safe, and effective medicine.

Abbreviations
- IVUS- Intravascular Ultrasound
- LMWH- Low Molecular Weight Heparin
- LRV- Left Renal Vein
- NCS- Nutcracker Syndrome
- RVT- Renal Vein Thrombosis
- SMA- Superior Mesenteric Artery
- TPA- Tissue Plasminogen Activator

References

Abstract
We report a case of herpes zoster ophthalmicus complicated by post-herpetic neuralgia. A 63-year-old female with history of hypertension, anxiety, depressive disorder, and a recent traumatic fall presented to clinic with sudden onset of severe right frontal headache. Forty-eight hours later, her pain worsened and she developed a localized rash on the right upper eyelid. On physical exam, an erythematous eruption involving the right fronto-temporal and periocular regions, and marked edema of the right upper eyelid were noted. A diagnosis of herpes zoster ophthalmicus was made. She was treated with oral valaciclovir, prednisone, and acyclovir in doses of 500 mg five times a day and acetaminophen with codeine. After one week, eyelid edema resolved and most lesions had matured. At a four-week follow-up, she continued to have significant pain at the site of prior eruption. She was diagnosed with post-herpetic neuralgia and prescribed gabapentin. Five months after the diagnosis of herpes zoster ophthalmicus, she still reported significant pain and discomfort. Herpes Zoster and its sequelae are painful and debilitating, but are preventable with the zoster vaccine. It is critical for healthcare providers to counsel their patients regarding the importance of timely vaccination.

Keywords: Herpes zoster, herpes zoster ophthalmicus, post-herpetic neuralgia, vaccination

Introduction
The varicella-zoster virus belongs to the alpha-herpesvirus family. Primary infection causes varicella or “chicken pox,” which is usually a benign viral illness that presents in childhood as a generalized vesicular eruption with malaise and low-grade fever. In adults, illness can be more severe, and complications such as pneumonia or encephalitis may ensue. Reactivation of the varicella virus many years after primary infection can lead to herpes zoster or “shingles.” This reactivation is possible because after initial infection the virus establishes latency in the dorsal root ganglia and cranial nerve ganglia and is not completely eradicated.

Herpes zoster presents as a painful rash in a dermatomal distribution. It can involve dermatomes in the head, chest, and abdominal regions, and does not cross the midline. Involvement of the ophthalmic division of the trigeminal nerve is particularly painful, and is referred to as herpes zoster ophthalmicus. Factors that have been associated with reactivation of the virus and resultant “shingles” later in life, include autoimmune disease, inflammatory bowel disease, immunodeficiency states, and depression. Reactivation may also be related to the normal decline in immunity that occurs as individuals get older or after exposure to certain medications. There are numerous complications from herpes zoster. The most common is post-herpetic neuralgia, a debilitating neuropathic pain that persists after the resolution of the rash. Here we report a case of herpes zoster ophthalmicus with post-herpetic neuralgia, in the setting of recent physical trauma and depressed mood as risk factors.

Case Presentation
A 63-year-old female with a past medical history of hypertension, hypothyroidism, and depressive disorder presented to her physician with complaints of pain in the right forearm and left chest wall after a recent traumatic fall. She states that while at a wedding, she had gone to the bathroom to change her contact lenses for glasses due to eye discomfort. When she exited the bathroom, her vision was slightly blurred and she missed a step, falling on her left knee, left chest, and right wrist. She also bruised her forehead and her eyelashes impacted the area lateral to her eyes. Her medications include levothyroxine 112 mcg daily, olmesartan 20 mg daily, and pravastatin 20 mg daily. Social history was significant for increased psychosocial stressors, with patient assuming primary caregiver duties for a terminally ill relative and the recent losses of her mother and cousin. On review of systems, patient had multiple painful sites including a central chest and right arm pain, with associated fatigue and pain in the right knee, thigh, and wrist. She also bruised her forehead and periorbital regions, and marked edema of the right upper eyelid.

The patient had a history of depressed mood as risk factors. She was referred for chest, knee, forearm, and wrist x-rays and was given an intramuscular injection of dexamethasone 10 mg mixed with acetaminophen with codeine 300-30 mg, one tablet three times a day. She was referred for chest x-rays and was given an intramuscular injection of dexamethasone 10 mg mixed with acetaminophen 300-30 mg, one tablet three times a day as needed for severe pain. X-rays all came back negative, and the patient had improved significantly within ten days.

Herpes Zoster: Case Review and Discussion
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Figure 1: Initial venogram demonstrates extrinsic compression of the LRV with a large filling defect, concordant with thrombus (red arrow) seen on CT (left). Markedly improved vessel caliber (right) post-intervention with aspiration thrombectomy.

Figure 2: Initial venogram demonstrates extrinsic compression of the LRV with a large filling defect, concordant with thrombus (red arrow) seen on CT (left). Markedly improved vessel caliber (right) post-intervention with aspiration thrombectomy.
Two months later patient called with complaints of sudden onset of severe right frontal headache. She was advised to come to the clinic as potential etiologies that warranted further immediate evaluation included temporal arteritis and uncontrolled hypertension. Patient declined visit to the clinic. She started a regimen of acetaminophen alternating with ibuprofen for the headache and monitored her blood pressure, which she reported as normal. Forty-eight hours later, she developed increased pain and a localized rash involving the right upper eyelid (Figure 1) and presented to her ophthalmologist. Vital signs were as follows: systolic blood pressure 118/86, pulse 89, and respiratory rate 16. Physical examination showed an erythematous eruption involving the right fronto-temporal region and right periorbital region, with marked edema of the right upper eyelid (Figure 1) and presented to her ophthalmologist.

She was seen for follow up in the outpatient clinic after four weeks, and while skin lesions had resolved, she continued to have significant localized pain at the site of the prior eruption. Laboratory studies at that visit were similar to baseline labs, and showed glucose 90, HgA1C 5.5, WBC 5.2, hemoglobin 14.2, hemotocrit 42.8, platelets 293, TSH 0.484, and vitamin D level of 21.3. Antinuclear antibody levels were negative. She was given the diagnosis of post-herpetic neuralgia and started on oral gabapentin (300 mg capsule twice a day) and vitamin D supplementation. Patient discontinued gabapentin after several days due to excessive somnolence, and pain was moderately controlled with alternating ibuprofen 600 mg and acetaminophen 500 mg twice a day. Stronger opioid therapy was avoided due to concerns for chemical dependency and respiratory depression. At follow-up several months later, she still had persistent moderate pain and numbness with paresthesias at the site of the previous eruption. She was started on duloxetine 30 mg daily by mouth to assist with both neuropathic pain as well as ongoing anxiety and depression.

At the time of her three-month follow up, patient did not show for her appointment and was contacted over the phone. She had improved, but still reported chronic discomfort in the right periorbital region, which she described as moderate pain with associated numbness. She reported improvement in her anxiety with duloxetine and family support. Patient was contacted via phone two months later after failing to attend her scheduled appointments. Several months later she was again contacted and reported some improvement in her pain and diminishing social stressors, though still experienced significant difficulty sleeping at night. Gabapentin 300 mg at bedtime was added to her medication regimen and she was scheduled for a follow-up appointment. Though she continues experiencing difficulties related to the post-herpetic neuralgia, she notes more effective coping with her medical and psychosocial situation.

Discussion

In the general population, the lifetime risk of developing herpes zoster is approximately 20% to 30%, and the risk increases up to 50% in those living beyond the age of 85.1 In the United States, the Centers for Disease Control (CDC) estimates that there are 1 million cases of herpes zoster annually.2 Almost half of all individuals with herpes zoster develop complications, with postherpetic neuralgia being the most common.3 Postherpetic neuralgia is described as a neuropathic pain that persists more than thirty to sixty days after resolution of the rash and may last for more than one year in 30-50% of patients.4 The pain can interfere with activities of daily living and consequently result in depression and loss of independent living.5 Postherpetic neuralgia is the number one cause of suicide in patients with chronic pain over the age of 70.6

Additional complications of herpes zoster include aseptic meningitis, bacterial superinfection, hearing impairment, Bell’s palsy, Ramsay Hunt syndrome, motor neuropathy, transverse myelitis, vasculopathies, and herpes zoster ophthalmicus.7 Among patients with herpes zoster, approximately 10% to 20% will have herpes zoster ophthalmicus.8 Some of the manifestations of herpes zoster ophthalmicus include keratitis, episcleritis, iritis, and conjunctivitis, and neutritis.9 These complications can decrease the quality of life and interfere with activities of daily living.

Studies have shown that multiple risk factors are associated with the risk of developing herpes zoster. The risk is higher among women, individuals with a family history, and immunocompromised individuals such as organ transplant recipients and those with leukemia, lymphoma, or human immunodeficiency virus infection.10,11 A large study conducted in the United Kingdom by Forbes et al found that certain medical conditions were associated with an increased risk of herpes zoster. These high risk conditions included rheumatoid arthritis, systemic lupus erythematosus, inflammatory bowel disease, chronic obstructive pulmonary disease, asthma, kidney disease, type 1 diabetes, and depression.12 A 2017 Danish study by Schmidt et al, reported similar risk factors, with the addition of type 2 diabetes, and the recent use of glucocorticoids.13 A systematic review and meta-analysis by Kawai et al, reported that statin use and physical trauma were also independent risk factors for herpes zoster.14 Kawai also found that smokers had a reduced risk of developing herpes zoster. Forbes et al found an increased risk for the development of postherpetic neuralgia in smokers.15 In summary, risk factors for herpes zoster are varied, and include trauma and genetic, medical, psychosocial, iatrogenic factors.

Our patient's potential risk factors included recent physical trauma, recent steroid use, chronic statin use, and increased stressors. A patient history that explores risk factors is important for identification of high-risk patients and important when counseling patients about the importance of vaccination. The suffering due to herpes zoster and its serious long-term sequelae are completely preventable through vaccination. Providers should focus on identifying risk factors and prophylactically educate and offer vaccination to patients to decrease incidence of herpes zoster.

There are currently two vaccines available for the prevention of herpes zoster in adults. Zostavax, a live attenuated vaccine, has been in use since 2006.15 Zostavax is similar to the varicella vaccine that is used in children to prevent chickenpox, but with an increased antiviral potency. Shingrix, a recombinant subunit vaccine, was recently approved for use in the United States by the Food and Drug Administration (FDA) in 2017.16 Shingrix has greater effectiveness (89%) compared to 50-55% reported effectiveness for Zostavax. Shingrix offers greater protection against the post-herpetic neuralgia and a prolonged period of protection.17 Shingrix has the disadvantage of requiring two doses given several months apart, compared to the single dose needed for Zostavax.

Although immunocompromised individuals have an increased risk for the development of herpes zoster, live attenuated vaccines are contraindicated in this population; the Centers for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP) does not recommend vaccination in this population.18 Current recommendations from the ACIP include vaccination of immunocompetent patients with Shingrix that can begin at age 50 as a two-dose vaccination series with the second dose given 2-6 months after the initial dose. Individuals who have previously received the Zostavax vaccine are encouraged to receive the additional two-dose Shingrix vaccine.19 If Shingrix vaccine is unavailable in an area, then the CDC recommends vaccination with the Zostavax. There is no age limit as to when the vaccines can be given. As more than 99% of individuals living in the United States over the age of 40 have had exposure to chickenpox, vaccination is particularly important.20 These CDC vaccine recommendations are supported by the U.S. Preventive Services Task Force.21

Conclusion

Our case demonstrates the classic presentation and course of herpes zoster, including the sequela of chronic neuropathic pain. Herpes zoster is caused by reactivation of the varicella zoster virus. It presents as a painful dermal rash that may involve the head, thorax or abdominal regions. Herpes zoster affecting the ophthalmic division of the trigeminal nerve, known as herpes zoster ophthalmicus, can cause severe and debilitating pain and affect the eye. The most common chronic complication of herpes zoster is post-herpetic neuralgia, which can have devastating consequences for patients especially those who are fragile or have underlying emotional disorders. Post-herpetic neuralgia negatively

Figure 1: 1) Day 1 of herpes zoster rash. 2) Day 5 of herpes zoster rash. 3) Day 8 of herpes zoster rash.

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factors, such as sun exposure, medication use, atrophic skin diseases, and various other dermatoses should also be taken into consideration. Echo density can provide helpful information regarding the keratin and collagen status of the epidermis and dermis, respectively, as ultrasound of the skin demonstrates an echo interface. In particular, evidence suggests that skin thickness is typically higher in males than females, as opposed to echo density, which is typically higher in women.1,11 Although age was not reported to significantly affect echo density, it has a considerable impact on skin thickness. The dermis is often thinner in the elderly, with progressive loss of thickness with age.1,10,12 In addition to its importance within a number of other clinical scenarios, information regarding the factors that influence skin thickness is particularly vital to the success of skin graft harvests and wound healing efforts.

Firooz et al. used HFUS to assess influencing factors such as gender, age, and the location on the skin to further determine how these variables affect skin thickness and echo density.1 Epidermal thickness, which is defined as the thickness of the epidermis, is much thinner compared to females, showing statistical significance on the neck compared to males, whereas the dermis is much thicker, indicating that high frequency ultrasonography is much thicker, indicating that high frequency ultrasonography is a valuable tool in visualizing the skin layers, especially where precise interrogation of the skin’s thickness and density is necessary. In this paper, we outline current literature to explore the factors that contribute to skin thickness variability and evaluate the utility of ultrasound to measure these changes.

Keywords: Skin thickness, aging, ultrasound

Introduction

In order to measure skin thickness, a variety of tools have been used and described in the literature. Scanning electron microscopy and light microscopy have both been used to measure thickness of skin in vitro.10 To measure the thickness of the skin in vivo, a skin caliper has been used, however, it is less commonly used for direct in vivo measurement of epidermal and dermal thickness.3 Two types of ultrasonography, including modes A and B, as well as different frequencies can be used. The dermis and hypodermis can be evaluated in vivo by use of both ultrasound and dual frequency ultrasound.12–14 Thickness measurements made with such technology can contribute to skin thickness variability and evaluate the utility of ultrasound to measure these changes. This review also discusses the utility of ultrasound in measuring skin thickness when indicated for various clinical situations.

Factors influencing skin thickness and echo density

Skin thickness and echo density can be influenced by factors such as increasing age, gender, and the particular anatomical site on the body. Factors such as sun exposure, medication use, atrophic skin diseases, and various other dermatoses should also be taken into consideration. Echo density can provide helpful information regarding the keratin and collagen status of the epidermis and dermis, respectively, as ultrasound of the skin demonstrates an echo interface.1 In particular, evidence suggests that skin thickness is typically higher in males than females, as opposed to echo density, which is typically higher in women.1,11 Although age was not reported to significantly affect echo density,1 it has a considerable impact on skin thickness. The dermis is often thinner in the elderly, with progressive loss of thickness with age.1,10,12 In addition to its importance within a number of other clinical scenarios, information regarding the factors that influence skin thickness is particularly vital to the success of skin graft harvests and wound healing efforts.

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of the dermis in all ages was higher in men than in women on the forearm. Furthermore, 25 MHz A-mode (amplitude mode) ultrasonography used to measure the ventral forearm of 54 men and 64 women between ages 3-90 yrs of age showed that in all ages, the skin thickness of men was higher than women’s (p<0.001). Because different sites of the body were measured and different tools were utilized, the studies suggest that there is strong evidence that men have a thicker dermis than women do overall.

**Epidermal Entrance Echo Thickness**

Epidermal entrance echo thickness was also measured with the use of 2D HFUS, indicating that it is higher in men than women; however, it did not reach statistical significance in any site.  

**Echo Density**

Lastly, the echo density of the dermis was found to be higher in females on all sites, showing significance on the neck only.  

**Skin thickness variation by anatomical location**

Wilms’ Tumor: A Clinical Review of Doxorubicin Use in Pediatric Postoperative Treatment

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Abstract

Background: Wilms’ tumor (WT) is a pediatric nephroblastoma commonly affecting children in the first few years of life. Advances in treatment have increased five-year survival rates from 5% in the early 1900s to presently over 90%. Doxorubicin is a common chemotherapeutic agent used both preoperatively and postoperatively in the treatment of WT. Though it has benefitted patient survival, it is also a known cardiotoxic that may predispose WT survivors to heart failure in later life. The purpose of this work is to investigate the literature on the clinical use of doxorubicin in the pediatric treatment of WT.

Methods: Comprehensive literature review on pre- and post-operative anthracycline use in WT patients due to staging based on the two main research groups, the Children’s Oncology Group (COG) and the International Society of Pediatric Oncology (SIOP).

Results: Green et al. found cumulative dosage of doxorubicin exceeding 300 mg/m² in the chemotherapeutic regimen of WT pediatric patients to be the most significant variable in increasing the likelihood of developing congestive heart failure later on in life. Pritchard-Jones et al. investigated 583 patients diagnosed with WT between the ages of 6 months and 18 years, which found that doxorubicin had a negligible benefit in the 5 year survival rates of stage II-III intermediate risk WT patients.

Discussion/Conclusion: With WT’s excellent prognosis, the focus of treatment has shifted from maintaining high five-year survival rates to mitigating the long-term effects of chemotherapy. Investigation of multiple studies suggest alternative anthracyclines and accurate staging of WT to prevent overtreatment since cumulative dosage has been directly correlated to risk of developing congestive heart failure.

Keywords: Wilms Tumor, Pediatric Nephroblastoma, Anthracycline

Introduction

Wilms’ tumor (WT) is the most common renal malignancy of early childhood, affecting one out of every 8,000-10,000 children each year in North America, typically presenting as a unilateral tumor. WT occurs via loss of function mutations of tumor suppressor genes WT1 or WT2 on chromosome 11.¹

WT is typically categorized into different stages based on the severity of the nephroblastoma. Staging is of particular importance in WT management due to variance in recommended chemotherapy and associated side effects. WT is typically diagnosed using imaging tests such as ultrasounds and computed tomography (CAT) scans. Once the diagnosis is made, the WT is surgically removed and histologically staged, and further evaluated by the surgeon and pathologist to determine postoperative chemotherapy treatment.²

Currently, treatment for WT at intermediate-risk Stage II and beyond involves partial to complete nephrectomy and the administration of chemotherapy, which involves the use of doxorubicin, vincristine, and actinomycin D. Doxorubicin belongs to the anthracycline family of antitumor agents and is one of the most effective cancer treatments.⁶ While use of doxorubicin in postoperative chemotherapy is extremely effective, shown by the high survival rate of WT patients, there are growing concerns over the cardiotoxic effects of long-term anthracycline use.¹ Based on several recent studies, it appears possible to mitigate doxorubicin’s cardiotoxic effects for all stages and its potential for excessive use secondary to over staging in intermediate-risk Stage II WT children.

Etiology

While a single cause of WT has yet to be found, there are several chromosomal mutations that appear in patients diagnosed with this malignancy. Currently, the most common mutation found in 30% of patients is the inactivation of the tumor suppressor FAM123B gene, which is located on the X chromosome that includes the gene WT1. When the WT1 gene is suppressed by the inactivation of FAM123B, embryologic metanephric blastema fail to differentiate, leading to

References

patches in the pediatric kidney that are believed to be the cause of the nephroblastoma.

Due to the location of FAM123B on the X chromosome, there appears to be a slightly higher incidence of WT in girls than in boys.2 Several other studies have also shown a higher incidence in Africans and African Americans, possibly because of higher rates of a separate nephrotic syndrome focal segmental glomerulosclerosis (FSGS) and HIV-1 infection in these populations, both of which are strongly associated with WT.2,3 Despite the varied genetic origins of the nephroblastoma, the survival rate of WT has increased to approximately 89%, compared with 5% in the 1960s.4

STAGING OF WILMS’ TUMOR

Treatment for WT will depend on patient age, tumor pathology, treatment efficacy, and tumor stage. Staging refers to the classification of the tumor based on its extent and magnitude.5 The two main WT research groups, the Children’s Oncology Group (COG) and the International Society of Pediatric Oncology (SIOP), suggest different staging methods. However, both COG and SIOP include stage II tumors as those extending beyond the kidney capsule but still completely resected during surgery. COG staging does not indicate renal blood vessel involvement, whereas SIOP staging includes blood, lymphatic, and nearby organ invasion as long the tumor is completely removed. For SIOP criteria, stage II tumors are also biopsied prior to preoperative chemotherapy or surgery. Stage III tumors in both cases involve residual tumor following surgery, abdominal and pelvic lymph node metastases, tumor thrombi during surgical resection, and tumor rupture prior to or during surgery.6

Considering the importance of proper WT staging, Borgstein et al. investigated the relative agreement between surgical and pathological level staging of WT patients. This study found 84% majority agreement in the WT staging between the surgical stage and pathological stage assessment of the tumor, citing one of the difficulties of accurate WT staging occurring when histological tissue samples are collected during surgery. Occasionally, the sampled tissue does not encompass the area of greatest risk of rupture, which can lead to understaging of the tumor to stage II.5

General Treatments for Wilms’ Tumor

In general, all the stages of WT are treated with nephrectomy (partial or radical) and chemotherapy. In terms of surgical procedure, radical nephrectomy remains the primary treatment for unilateral WT.1,5 Here the surgeon removes the entire affected kidney, samples suspected lymph nodes, and evaluates for tumor metastases to determine accurate tumor stage.

In addition to surgery, chemotherapy can be used preoperatively or postoperatively, depending on COG or SIOP recommendations. The two most commonly administered are vincristine and actinomycin D. Depending on the tumor’s severity and associated risks, such as in intermediate-risk stage II-III WT, doxorubicin may be included in treatment.8

Preoperative chemotherapy typically includes doxorubicin in addition to vincristine and actinomycin D.9 The benefit of preoperative chemotherapy includes reduction of tumor size and its vascular supply, which may subsequently reduce the risk of surgical complications.10

Recommended postoperative chemotherapy regimens for WT include Regimen EE-4A (vincristine, actinomycin D for 18 weeks postnephrectomy) for lower stages of WT and Regimen DD-4A (vincristine, actinomycin D, doxorubicin for 24 weeks with baseline nephrectomy or biopsy with subsequent nephrectomy) for higher stages of WT.11 The key distinction between the two regimens is the inclusion of doxorubicin.

Dosage dependence of Doxorubicin

Doxorubicin has been an important antineoplastic used in the treatment of more aggressive stages of WT for the last three decades, despite its long-term cardiotoxic effects. Studies since the early 1990s have shown the cardiac toxicity of anthracyclines, which includes doxorubicin.12,13 However, the efficacy of anthracyclines in increasing pediatric survival rates was thought to outweigh its adverse effects. In 2001, Green et al. looked into the development of congestive heart failure (CHF) as a consequence of the long-term cardiotoxic effects found in patients with WT treated with doxorubicin. Although there is a high survival rate of WT using doxorubicin, a significant cardiotoxic risk occurs at higher stages of WT.14

In the study there were two cohorts: Cohort 1 comprised of patients who received doxorubicin as part of their initial treatment plan for WT; Cohort 2 comprised of patients who were not given doxorubicin in their initial therapy, but were treated with a higher cumulative dose of doxorubicin compared to Cohort 1 after a relapse of WT. Patients were monitored for up to twenty years from diagnosis of WT to development of CHF.

Relative risk (RR) analysis revealed that the incidence of developing CHF in Cohort 1 was 4.4% and 17.4% in Cohort 2. The study analyzed several characteristics of the thirty-five patients that developed CHF of the 2,710 monitored patients. Females were four and a half times more likely to develop CHF as males; patients receiving lung radiation and left abdominal radiation had a two-fold increase in RR of CHF compared to those treated without radiotherapy.

However, the study states that “cumulative doxorubicin dose was the most important risk factor for the occurrence of CHF”.14 Patients receiving a cumulative dose of ≥300 mg/m² doxorubicin showed a six-fold increase in RR. Interestingly, those receiving a cumulative dose of 1-199 mg/m² saw no increase RR and those receiving 200-299 mg/m² of cumulative doxorubicin were only 50% more susceptible to CHF.

Finally, the study found that RR increased three-fold for every 100 mg/m² of doxorubicin given to patients who also had radiation therapy.14

The higher RR seen in Cohort 2 can be attributed to the increased amount of lung radiation and higher dose of doxorubicin used in conjunction to combat a relapsed WT. Gender and radiation both affect the RR of WT, but overall using ≥ 300 mg/m² doxorubicin was the most significant variable in increasing the likelihood of developing CHF.

Because the median cumulative dose of doxorubicin given to patients in the study was 302 mg/m², at least half the patients received a dose of doxorubicin above the threshold of greatest RR.14

Overuse of Doxorubicin

A large study by Dr. Pritchard-Jones was conducted on behalf of the SIOP Renal Tumors Study Group. This study found that doxorubicin offered no significant difference in 2-year and 5-year survival rates of intermediate-risk stage II-III WT patients, bringing into question the chemotherapeutic value of doxorubicin and whether its benefit on short-term survival outweighs its known long-term risks of cardiotoxicity.

In this study 583 patients had been diagnosed with WT between the ages of 6 months and 18 years, ascended from 251 hospitals in 26 countries, following these children carefully to investigate the “effects of placebo controlled omission of doxorubicin from their postoperative chemotherapy”.15 Doxorubicin had negligible benefit in the 5-year survival rates of stage II-III intermediate risk WT patients when “histological assessment of tumour response is positively received during preoperative chemotherapy”.15

Doxorubicin was the only omitted chemotherapeutic agent from the standard regimen of doxorubicin, actinomycin D, and vincristine.16 All patients received the same timing and quantity of dosages of actinomycin D and vincristine with a median study follow-up of 60.8 months. Of the 291 children receiving treatment including doxorubicin, there were 24 cases of tumor relapse. From the group of 292 children receiving treatment without doxorubicin, there were
36 incidents of tumor relapse, suggesting that the difference in number of tumor relapses between the two groups is statistically insignificant.2

Alternative Anthracyclines

Doxorubicin and daunorubicin are the two most commonly used anthracyclines in cancer treatment. Past studies have not extensively compared their cardiotoxicities.17 Feijen et al17 evaluated data from five cohorts with approximately 16,000 childhood cancer survivors. Patients were followed for an average of twenty years – with an upper limit at forty years of age for follow up. Of the 271 recorded diagnoses of heart failure (HF) seen in the study, more than two-thirds of patients were treated with only doxorubicin, and less than 10% were treated with only daunorubicin. The median dose for treatment of doxorubicin was approximately twice as high as for daunorubicin. The two anthracyclines were compared at an equivalence ratio of 1:1 per mg/m² and a bootstrap method with 1000 replications was used to determine the hazard ratio (HR) of doxorubicin to daunorubicin.

Primary analysis of the data was restricted to those patients treated with either daunorubicin or doxorubicin. Only patients with a minimum survival of five years from diagnosis of cancer were included. Of all these patients, the cumulative incidence of HF was 3.2% by the age of forty, and the primary model determined that the HF risk of daunorubicin to daunorubicin with all stipulations factored was 0.45. Therefore, it was concluded that daunorubicin was less cardiotoxic than doxorubicin.17

Discussion

As WT prognosis continues to improve, the focus of treatment has shifted from maintaining high five-year survival rates to mitigating the long-term effects of chemotherapy. Ultimately, the cumulative dosage of doxorubicin ≥300 mg/m² leads to a six-fold increase in the relative risk of developing heart failure later on in life. Borgstein et al14 found small discrepancies between surgical and pathological staging that could offer a reduction in doxorubicin exposure. Additionally, Pritchard-Jones et al18 found that with accurate staging, doxorubicin’s established risk of cardiotoxicity could be avoided in intermediate-risk stage II-III WT patients. This raises the interesting question of whether daunorubicin, as proposed by Feijen et al14, could be used instead as an alternative to doxorubicin in WT treatment. These studies show that in specific cases of intermediate-risk stage II-III WT, doxorubicin may not provide sufficient benefit to warrant its associated risks. Minimizing the cumulative dosage of doxorubicin in postoperative treatment can lead to a better quality of life for childhood WT survivors by decreasing their relative risk for developing heart failure as young to middle-aged adults.

References

French Huguenots in the medical development of sixteenth century Spanish St. Augustine, Florida

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Abstract

In 1564, French colonists led by René Laudonnière erected Fort Caroline, a riverside settlement in Timucua tribe territory near modern-day Jacksonville. French-Timucuan relations in northeast Florida undoubtedly served as a foundation for the Spanish who conquered in 1565 and controlled the region from their nearby fort at St. Augustine. French Huguenots lived with native Timucuan at Fort Caroline through disease, famine, hostility, and supply shortages. Challenging times introduced French settlers to novel Timucuan treatments, a catalyst for colonial medical progress. After the Spanish destroyed Fort Caroline, French surgeons cared for Spaniards and Timucuan alike at St. Augustine. French collaboration with Timucuan healers and later surgical support at the Spanish fort influenced the formation and persistence of St. Augustine, today the oldest city in the continental United States.

Keywords: Huguenots; Fort Caroline; St. Augustine; Timucuan medicine; colonial medicine

Historical Background

Spanish forces led by Pedro Menéndez de Avilés established a colony at St. Augustine in 1565 that predated the famous British settlements at Jamestown, Virginia in 1607 and Plymouth, Massachusetts in 1620. Menéndez de Avilés became Florida’s founding colonial governor after forty years of conquistador voyages sponsored by the Spanish crown. From 1513 to 1559, the milita of Ponce de Léon, Narváez, De Soto, Cáncer, and De Luna confronted Florida natives in an effort to expand the Spanish empire. Conquistador fleets often explored the interior of Florida with few resources. Some brigades adhered closely to the coast, others trudged through interior wetlands, but all retreated without planting a viable colony.

Many conquistador voyages to Florida were riddled with sequelae of trauma and infectious disease. In 1521, Ponce de Léon’s second voyage drew to an abrupt close shortly after landfall in the Caribbean, Central America, and South America. Without Spanish occupation, other Europeans began to express imperial interest in the Florida peninsula. In June 1564, French fleets made remarkable colonial progress along the unsettled northeastern coast of Florida under the guidance of René Laudonnière. His voyage led a French Protestant group collectively known as Huguenots in constructing and populating a fort near the mouth of a river many historians place at the St. John’s River near modern-day Jacksonville. They christened the settlement as Fort Caroline (Figure 1), making the first fortified European settlement in the continental United States a French entity.

Firsthand accounts of trauma, contagious disease, starvation, and lackluster medical care trickled back to the Spanish crown. In 1561, King Philip II of Spain decided that settling Florida was no longer worthwhile and suspended all plans for future conquistador expeditions. Spanish temporarily abandoned Florida, yet remained active in the New World with successful missions flourishing across the Caribbean, Central America, and South America.

Without Spanish occupation, other Europeans began to express imperial interest in the Florida peninsula. In June 1564, French fleets made remarkable colonial progress along the unsettled northeastern coast of Florida under the guidance of René Laudonnière. His voyage led a French Protestant group collectively known as Huguenots in constructing and populating a fort near the mouth of a river many historians place at the St. John’s River near modern-day Jacksonville. They christened the settlement as Fort Caroline (Figure 1), making the first fortified European settlement in the continental United States a French entity.

French-Timucuan Medical Exchange at Fort Caroline

Fort Caroline blossomed as the French forged amicable relationships with the native Timucua tribe. The French were far less military-centric than Spanish conquistadors and satisfied with living free of religious persecution in Florida. French colonists did not strive to conquer the entire peninsula, nor did they take efforts to enslave and religiously convert natives. The friendly disposition of the French earned them access to native food supplies. Timucua healers went to great lengths to instruct the Huguenots at Fort Caroline on methods for using local plants to make medicinal treatments for their ill settlers. One of the most important herbal medications introduced to the French was derived from the sassafras plant (Figure 2). The natives taught the French to take sassafras roots and brew medicinal teas. They used sassafras for nearly every ailment, believing in its ability to renew a person’s strength and help them overcome periods of illness. Fevers and dysentery weakened European settlers in the New World, leaving control and foreign body removal, their leader survived the first surgical operation in the history of Florida. His fleet retreated to Cuba where complications from sepsis killed Ponce de Léon three days after their arrival to Havana. Similarly, Hernando De Soto’s grueling three-year expedition came to a grinding halt in 1542 when he contracted a debilitating fever in the remote western reaches of the Florida territory. He died soon thereafter with Florida remaining a wild, unclaimed frontier. The deaths of Ponce de Léon and Hernando De Soto highlighted limitations that prevented early Spanish efforts at Florida colonization.

Figure 1: Fort Caroline, Le Floride. The French-Timucuan Medical Exchange at Fort Caroline blossomed as the French forged amicable relationships with the native Timucua tribe. The French were far less military-centric than Spanish conquistadors and satisfied with living free of religious persecution in Florida. French colonists did not strive to conquer the entire peninsula, nor did they take efforts to enslave and religiously convert natives. The friendly disposition of the French earned them access to native food supplies. Timucua healers went to great lengths to instruct the Huguenots at Fort Caroline on methods for using local plants to make medicinal treatments for their ill settlers. One of the most important herbal medications introduced to the French was derived from the sassafras plant (Figure 2). The natives taught the French to take sassafras roots and brew medicinal teas. They used sassafras for nearly every ailment, believing in its ability to renew a person’s strength and help them overcome periods of illness. Fevers and dysentery weakened European settlers in the New World, leaving control and foreign body removal, their leader survived the first surgical operation in the history of Florida. His fleet retreated to Cuba where complications from sepsis killed Ponce de Léon three days after their arrival to Havana. Similarly, Hernando De Soto’s grueling three-year expedition came to a grinding halt in 1542 when he contracted a debilitating fever in the remote western reaches of the Florida territory. He died soon thereafter with Florida remaining a wild, unclaimed frontier. The deaths of Ponce de Léon and Hernando De Soto highlighted limitations that prevented early Spanish efforts at Florida colonization.
them without an appetite and vulnerable to further disease. Sassafras administered as a tea seemed to stimulate their appetite and ultimately restore vitality. The act of brewing sassafras roots also killed most of the microbes in the water supply, thereby reducing the risk of water-borne illnesses. Enamored by the wondrous drug, colonists at Fort Caroline shipped several loads of sassafras roots back to France. As time went on, sassafras gained popularity in both the New World and across Europe. 15

While sassafras became the paramount plant for treating illnesses, the Timucua shared another tea known as casina that gained popularity among French settlers as a medicinal supplement for daily consumption. 16 The potent, highly caffeinated “black drink” had the power to suppress the appetite and fortify the constitution of those who drank it. The casina elixir enabled settlers to continue laboring, scavenging, and skip meals when food became scarce. Without these Timucuan medications, illness and starvation might have led the French to abandon Fort Caroline.

In addition to the new medications acquired at Fort Caroline, the French brought an essential member of the healthcare team that the Spanish conquistadors before them did not emphasize. Captain Laudonnière brought a handmaid who served as a nurse in Florida. He mentioned in his journals she was, “a nurse for the soldiers in their sickness as well as my own sickness.” He discussed her instrumental role in life at Fort Caroline where she was “esteemed by each of the men” for her nursing. In little more than one year, the French created a settlement that integrated a European surgeon and nurse with Timucuan health beliefs and practices.17-18

Huguenot survival and integration with the Timucua gained attention from the Spanish and swayed them to reconsider their laissez-faire stance on Florida the following year. On August 28, 1565, the feast day for St. Augustine of Hippo, a fleet of Spanish galleon directed by Pedro Menéndez de Avilés approached the Florida coast and made plans for invasion. Their raid on Fort Caroline resulted in French massacre, sparing only a few Huguenots who remained in custody of Spanish militia. The surviving French played an essential role in relaying information to the Spanish regarding nutrition, medicinal plants, treatment methods, and health rituals they learned from the Timucua at Fort Caroline.19

Following Menéndez de Avilés’ massacre at Fort Caroline, the remaining French became medical liaisons who enlightened the Spanish militia at St. Augustine with their knowledge of local pharmaceutical plants and health rituals. A noteworthy 1565 medical tome published in Spain alluded to the French influence on medicine in St. Augustine. Spanish physician Nicolás Monardes wrote a monograph entitled Historia medicinal de las cosas que se traen de nuestras Indias Occidentales (Medical study of the products imported from our West Indian possessions) that became famous as the first comprehensive book about medicines from the New World (Figure 3). Within his work, a twenty-page discussion on sassafras revealed, “a Frenchman which had been in those parts [Florida], showed me a piece of it, and told me of its virtue thereof.” He went on to say that “After the Frenchmen were destroyed, our Spaniards began to ware very sick, as the Frenchmen had been, and some of which [French] remained, did show it [sassafras] to our Spaniards, and how they had cured themselves with the water of this marvelous tree… Our Spaniards began to cure themselves with the water of this tree, and it wrought in them great effects that are almost incredible.” Given the imperial rivalry between the Spanish and French, it was remarkable for a Spanish physician to credit the French with passing New World medical wisdom of Frenchmen during this period.20

A similar series of events transpired for the utilization of “black drink” in St. Augustine. Throughout Florida’s colonial period, there were continual references to the habitual use of casina as a health supplement. A 1595 report from Florida noted that the Spaniards drank casina every day. A later account commented with satire that the only local products used by Spanish families in Florida were corn and casina. The Spanish revered the potent tea to the extent that they sent two native Florida Timucua back to Spain to cure the Canon of Seville of urinary tract disease, likely secondary to ureteral and bladder stones, with the diuretic casina.21

Figure 2: Sassafras plant, drawn by Spanish physician Nicolás Monardes.22

Figure 3: Folio within Nicolás Monardes’ 1565 monograph referencing the French acquisition of sassafras at Fort Caroline.20
French Surgeons in Early St. Augustine

Medications were not the only French marks on medicine in this land who are worth anything.” Not only was their medical competence questionable, but they came and went with each new breeze that brought ships through the mouth of the Matanzas River. The King wanted French prisoners like Le Compte sent to Spain, presumably for trial, but Governor Menéndez Marqués would not relinquish Florida’s only doctor. He believed that if Le Compte left St. Augustine, “he would be very much missed, and so I determined this time to leave him here.”

Three other unnamed French surgeons appeared in letters during the latter half of the sixteenth century, demonstrating St. Augustine’s reliance on their training to meet their town’s healthcare needs as well as the demands of Spanish medical regulations that called for the provision of a surgeon at each Spanish military fort.

Conclusion

St. Augustine’s reliance through numerous fever epidemics and periods of famine speaks volumes of their community’s ability to overcome forces of disease with limited resources. Although the Spanish Empire oversaw an unprecedented system of regulated healthcare in their Caribbean settlements, delivering care on the provision of a surgeon at each Spanish military fort.

French Governor Gonzalo Méndez de Cañó urged him to draft a formal address to the King of Spain regarding his salary and benefits as the only resident doctor of the colony. As a testament of his faith and reliance upon his colony’s only physician, Governor Méndez de Cañó affixed a letter of recommendation to the surgeon’s appeal for a higher salary. The monarch returned the twenty-ducat request with an offer for ten ducats, still two-and-a-half times Le Compte’s original salary.

Le Compte’s work in St. Augustine represented a great deal of irony. The Spanish were not allies with France, but they were unable to recruit a competent doctor to their new Florida colony. It speaks volumes that Spanish authorities needed to capture a surgeon and hold him as prisoner in order to keep a resident doctor in St. Augustine. He did not practice medicine exclusively alone, but his support system of assistant surgeons and apothecaries were not as skilled. In an August 1583 letter Governor Menéndez Marqués wrote to the Crown, he mentioned Le Compte as the Frenchman who is “a surgeon, of which there are none Spanish in this land who are worth anything.” Not only was their medical competence questionable, but they came and went with each new breeze that brought ships through the mouth of the Matanzas River. The King wanted French prisoners like Le Compte sent to Spain, presumably for trial, but Governor Menéndez Marqués would not relinquish Florida’s only doctor. He believed that if Le Compte left St. Augustine, “he would be very much missed, and so I determined this time to leave him here.”

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Conclusion

St. Augustine’s reliance through numerous fever epidemics and periods of famine speaks volumes of their community’s ability to overcome forces of disease with limited resources. Although the Spanish Empire oversaw an unprecedented system of regulated healthcare in their Caribbean settlements, delivering care on the provision of a surgeon at each Spanish military fort.

Le Compte was the only permanent medical figure in Florida for the community. 22

...
Proceedings of the 2019 FIU Herbert Wertheim College of Medicine Research Symposium & Awards Ceremony
### PROGRAM OVERVIEW

**Friday, April 26, 2019**

**Location:** Student Academic Success Center

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<td>Registration Opens</td>
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| 8:30 - 8:45 a.m.      | Welcome Remarks: Robert Sackstein, M.D., Ph.D.  
Dean and Senior Vice President for Health Affairs | SASC 160 |
| 8:45 - 10:15 a.m.     | Oral Presentations I                                                 | SASC 160 |
| 10:30 a.m. - 12:00 p.m.| Oral Presentations II                                                | SASC 160 |
| 12:00 - 1:30 p.m.     | Open Poster Session (Lunch Served)                                    | SASC 100 |
| 1:30 - 3:00 p.m.      | Oral Presentations III                                                | SASC 160 |
| 3:00 - 3:15 p.m.      | Break                                                                |          |
| 3:15 - 4:00 p.m.      | AOA Speaker: Robert Sackstein, M.D., Ph.D.  
Dean and Senior Vice President for Health Affairs | SASC 160 |
| 4:00 - 4:15 p.m.      | Break                                                                |          |
| 4:00 - 5:00 p.m.      | Awards Ceremony                                                      | SASC 160 |

### AOA KEYNOTE SPEAKER BIO

**Robert Sackstein, M.D., Ph.D.**

Robert Sackstein, M.D., Ph.D., is Dean of the Herbert Wertheim College of Medicine and Senior Vice-President for Health Affairs at Florida International University. He is a Professor Emeritus at the Harvard Medical School, where he continues to serve as the Director of the Harvard Career Development Program in Translational Glycobiology. Dr. Sackstein’s clinical expertise is bone marrow transplantation, and he is a widely recognized for his contributions to cell-based therapeutics. His scientific research efforts have defined the molecular processes that regulate the movement of cells in blood flow into different tissues throughout the body, and clinical applications of his research findings have led to improved outcomes for patients undergoing bone marrow transplantation, and for patients suffering from a variety of illnesses including cancer, autoimmune conditions, and osteoporosis.

Dr. Sackstein was born in Cuba and immigrated to Miami with his family in 1960. He attended Dade County public schools, and received his undergraduate degree in Biology from Harvard College, Summa cum Laude. Dr. Sackstein then obtained both his M.D. and Ph.D. degrees from the Harvard Medical School, where, upon graduation, he received the James Tolbert Shipley Prize for outstanding research. Dr. Sackstein was bestowed the Young Investigator Award from the International Society of Experimental Hematology for his pioneering work in identifying how blood-forming stem cells enter the bone marrow, the critical first hurdle in the success of bone marrow transplantation. These efforts placed him at the forefront of the field known as “translational glycobiology” and he is widely recognized for inventing a platform glycoengineering technology (known as “GPS”) that pilots the movement of blood-borne cells to sites of tissue injury. Based on his contributions to medicine and to medical science, Dr. Sackstein was elected as a member of the prestigious Association of American Physicians for his “pursuit of medical knowledge, and the advancement through experimentation and discovery of basic and clinical science and their application to clinical medicine.” Recently, he was awarded an honorary doctorate from the University of Murcia (Spain) for “improving the efficacy and safety of cell-based therapies, thereby enabling curative-intent treatments for a wide range of disabling and life-threatening diseases.”
On behalf of the directors and participants of the Fifth Annual FIU Herbert Wertheim College of Medicine Research Symposium and the Department of Medical and Population Health Sciences Research, we would like to extend a warm thank you to the amazing judges and reviewers who have worked tirelessly to support and recognize FIU research. We are tremendously appreciative of their selfless involvement in this process and are particularly grateful for their help in continuing and improving the Second Annual Research Symposium Awards. This symposium would not have been possible if it were not for their generosity with their time and expertise. They completed more than 240 abstract reviews and were tasked with judging the quality of more than 70 final presentations. Because of their efforts and support, this year’s symposium has proven to be the most successful to date.

Working together, we are preparing students for their future careers and driving FIU research to new heights. We hope that their generosity will inspire others to follow in their footsteps and volunteer their time and effort to support our FIU student researchers and the Herbert Wertheim College of Medicine community at large. Please join us once again in thanking these incredible women and men.

### Oral Presentations I

**Friday, April 26, 2019**
**8:45 a.m. – 10:15 a.m. | SASC 160**

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<td>Thomas Cowan, Pamela Duarte, Franklin Zhang</td>
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<td>Leah Cohen, Elana Muradova, Nikhil Khushalani</td>
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<td>Oren Cohen, Laura Valente</td>
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ORAL ABSTRACTS

**O1**

**Race and prevalence of end-stage renal disease among U.S. type 2 diabetic patients with renal manifestations**

Kenneth Chang, Hyunsu Jung, Kihyun Kwon, Grettel Castro, MPH. Pura Rodríguez de la Vega, MPH. Amalia Galindez, MD. Juan G. Ruiz, MD, MMSci.

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**Keywords:** ESRD, Race, Type 2 Diabetes Mellitus

**Introduction and Objectives:** Patients with Type 2 Diabetes Mellitus (T2DM) are at increased risk of developing microvascular disease, including chronic kidney disease (CKD). End-stage renal disease (ESRD) is a major cause of mortality among T2DM patients. Racial disparity in complications, especially ESRD, has been an ongoing issue and could be an important prognostic factor in these patients. Objective: To explore if there is an association between race and prevalence of ESRD among T2DM patients between age 15 and 64, with diabetic nephropathy.

**Methods:** We conducted a cross-sectional study (secondary analysis of National Hospital Discharge Survey (NHDS) data from 2010). Study population consisted of patients of age 15-64 from non-federal short-stay hospitals with confirmed diagnosis of T2DM and diabetic nephropathy. Our independent variable was race (white and non-white) and the outcome was prevalence of ESRD. We performed customary descriptive statistics and bivariate comparisons of distributions of control variables according to race and according to ESRD status. Both unadjusted and adjusted (multiple logistic regression) for potential confounders odds ratios (OR) and 95% confidence intervals between race and ESRD were computed.

**Results:** A total of 387 patients were included. With the exception of region of origin of cases there were no differences in the distribution of any control variables according to race nor according to ESRD status. There was no statistically significant relationship between race and the diagnosis of ESRD, and this estimation didn’t change even after adjusting for age (adjusted OR 0.95, 95% CI 0.53-1.76). Adjusted analysis also found a mildly elevated risk of ESRD in patients from age 40-54 years (adjusted OR 2.09, 95% CI 0.59-7.46), compared to patients between 15-39 and 55-64 years old.

**Conclusions-Implications:** We didn’t find evidence of a significant association between race and the prevalence of ESRD in T2DM patients with diabetic nephropathy. Due to insufficient statistical power and potential for selection bias, such an association cannot be ruled out. Further research with prospective collection of data, which allows for computing incidence rather than prevalence of ESRD is needed.

**O2**

**The association between race and survival among pediatric patients with neuroblastoma in the US between 1973 and 2015**

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**Keywords:** Cancer, Child Health, Neuroblastoma

**Introduction and Objectives:** Neuroblastoma is the most common childhood cancer diagnosed during the first year of life and the third most commonly diagnosed childhood cancer overall. Information regarding the influence of race on survival among neuroblastoma patients is limited compared to other childhood cancers. This study investigates the association between race and 5-year cause-specific survival in pediatric patients diagnosed with neuroblastoma in the US between 1973 and 2015.

**Methods:** This was a retrospective cohort study using the Surveillance, Epidemiology, and End Result (SEER) database. Patients aged 17 and younger of Black, White or Asian Pacific Islander (API) race diagnosed with neuroblastoma from 1973-2015 were included (n=2,119). Those who had missing information and/or were diagnosed at autopsy were excluded. The exposure variable was race (White, Black, API), and the outcome variable was 5-year cause-specific survival. Covariates included age (<1 years, 1-4 years, 5-17 years), gender, ethnicity (Hispanic, Non-Hispanic), stage (localized, regional, distant, unstaged/unknown), tumor site (adrenal, non-adrenal), and year of diagnosis (1973-1999, 2000-2004, 2005-2015). Cox proportional hazard models were used to calculate unadjusted and adjusted hazard ratios with their corresponding 95% confidence intervals.

**Results:** After adjusting for potential confounders, there was not a statistically significant difference in the hazard of survival for blacks (HR 0.93, 95% confidence interval (CI) 0.74-1.16) or API (HR 1.02; 95% CI 0.76-1.37) compared with whites. In addition, patients diagnosed between 2000-2004 (HR 0.46; 95% CI 0.36-0.59) and 2005-2015 (HR 0.33; 95% CI 0.26-0.41) had decreased hazards of death when compared to patients treated during 1973 to 1999. Finally, patients with adrenal neuroblastoma were not found to have different survival when compared to those with a non-adrenal neuroblastoma (HR 1.16; 95% CI 0.99-1.36).

**Conclusions-Implications:** Our study did not find an association between race and 5-year survival among pediatric patients diagnosed with neuroblastoma. However, survival improved among all patients treated during 2000-2004 and 2005-2015, respectively, when compared with neuroblastoma patients treated before the year 2000. Future research that takes socioeconomic status, genetic factors, and changes in treatment into account should be conducted to further explore possible disparities by race.
Prescriptions of potentially inappropriate medications in older adults in the US: Results from the NAMCS 2006-2010

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Keywords: Violence, Childhood, Depression

Keywords: Beans List, Potentially Inappropriate Medications, Geriatric, Polypharmacy

Introduction and Objectives: The American Geriatrics Society (AGS) developed Beers Criteria for potentially inappropriate medications (PIMs), in which the risks outweigh the benefits in the elderly population. Yet, studies have shown that 42% of elderly American adults from 2006-2010 were prescribed at least one medication on Beers List. Objective: To assess the frequency of PIM use, and to determine if patient characteristics are associated with PIM prescriptions in adults 65 years or older in the United States.

Methods: We analyzed cross-sectional data from the 2013 and 2014 National Ambulatory Medical Care Surveys (NAMCS). All patients 65 years and older were included (n=26,500). We assessed the association of being prescribed a PIM with the following patient characteristics: polypharmacy (use of ≥5 medications), race/ethnicity, age, gender, source of payment, and physical health status. In this study, we defined prescription of PIMs to only include medications on Beers List with a “strong” strength of recommendation, “high” quality of evidence and recommendation to “avoid.” Multivariable logistic regression analysis was conducted to determine the independent association of selected patient characteristics and PIM prescriptions.

Results: We found that 14% of patients in our study received PIMs. The most common PIMs were medications related to central nervous system (73%), cardiovascular (18%), endocrine (6%), and pain (3%) medications. Patient characteristics found to be independently associated with prescription of PIMs were polypharmacy (use of ≥5 medications) [aOR=4.0; 95% CI (4.0-9.4)], higher poverty income as % of poverty line (≥100% to <200%, ≥200% to <400%, ≥400% and maternal race/ethnicity (white, black, Hispanic, other). Independent associations were assessed using multivariable logistic regression for the outcome ever breastfeeding and cox proportional hazard model logistic regression.

Results: Being obese was associated with decreased odds of breastfeeding initiation and reduced breastfeeding duration (PIM on ≥5 Cockroft dose) and with higher hazard of breastfeeding cessation (HR=1.17, 95%CI=1.05-1.3) compared to normal weight women. At lower levels of maternal income, obese women had a higher hazard of breastfeeding cessation compared to normal weight women (HR=1.56, 95% CI=1.15-1.29) than compared to normal weight women. At lower income levels, there was no difference in cessation of breastfeeding (HR=0.75, 95% CI=0.71-1.23) at 400% poverty line. Obese or overweight black women had higher hazards of breastfeeding cessation than those of white women (HR=2.8, 95% CI=1.46-5.36 for black overweight, HR=2.21 95% CI=1.04-4.7 for black obese, and HR=1.13, 95% CI=1.01-1.27 for white overweight, 95% CI=1.17-1.23 for white obese.

Conclusions-Implications: Higher maternal prepregnancy BMI negatively impacts breastfeeding practices, and the impact is highest for the lowest income and black women. Health care providers and policy implementers can target these at risk populations to improve breastfeeding rates and reduce disparities. KEYWORDS: breastfeeding, breastfeeding, pregnant, pregnancy, body mass index (BMI), prepregnancy BMI, obesity, income, socioeconomic status, education, race, ethnicity.

Association between prepregnancy BMI and breastfeeding initiation and duration: effect modification by household income level and race/ethnicity

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Keywords: Breastfeeding, Pregnancy, Body Mass Index (BMI), Income, Socioeconomic Status

Introduction and Objectives: Maternal obesity has been consistently correlated with decreased incidence and duration of breastfeeding. Social determinants of health, including obesity, play a role in breastfeeding practices; however, the interaction between these factors and obesity regarding breastfeeding practices is less well explored. Aim: To assess if household income or race/ethnicity modify the association between maternal prepregnancy BMI and initiation and duration of breastfeeding.

Methods: We utilized data from the US Infant Feeding Practices Study 2 (IFPS 2, 2005-2007). Our independent variables were maternal prepregnancy BMI and the dependent variables were ever breastfeeding and duration of breastfeeding in weeks. Effect modifiers explored include household income as % of poverty line (<100%, >100% to <200%, >200% to <400%, >400%) and maternal race/ethnicity (white, black, Hispanic, other). Independent associations were assessed using multivariable logistic regression for the outcome ever breastfeeding and cox proportional hazard model logistic regression.

Results: Being obese was associated with decreased odds of breastfeeding initiation and reduced breastfeeding duration (PIM on ≥5 Cockroft dose) and with higher hazard of breastfeeding cessation (HR=1.17, 95% CI=1.05-1.3) compared to normal weight women. At lower levels of maternal income, obese women had a higher hazard of breastfeeding cessation compared to normal weight women (HR=1.56, 95% CI=1.15-1.29) than compared to normal weight women. At lower income levels, there was no difference in cessation of breastfeeding (HR=0.75, 95% CI=0.71-1.23) at 400% poverty line. Obese or overweight black women had higher hazards of breastfeeding cessation than those of white women (HR=2.8, 95% CI=1.46-5.36 for black overweight, HR=2.21 95% CI=1.04-4.7 for black obese, and HR=1.13, 95% CI=1.01-1.27 for white overweight, 95% CI=1.17-1.23 for white obese.

Conclusions-Implications: Higher maternal prepregnancy BMI negatively impacts breastfeeding practices, and the impact is highest for the lowest income and black women. Health care providers and policy implementers can target these at risk populations to improve breastfeeding rates and reduce disparities. KEYWORDS: breastfeeding, breastfeeding, pregnant, pregnancy, body mass index (BMI), prepregnancy BMI, obesity, income, socioeconomic status, education, race, ethnicity.
A cross-sectional, seroepidemiological study was conducted using data previously generated with an enzyme-linked immunosorbent assay (ELISA) to detect antibodies toward B. pseudomallei in the native population. Serum originated from asymptomatic population members (n=756) from three clinics in the Ouest Department of Haiti and was screened for polyvalent anti-B. pseudomallei IgM or IgG antibodies. Seroepidemiological population members were defined by a threshold absorbance (O.D.) value, three standard deviations above the sample population average. The number of IgG and IgM positives were tabulated and reported as a percentage. A logistic regression was used to determine the associated between seroprevalence and demographic factors; multiple logistic regression models were used to adjust for potential confounding and included all variables. Results: The population seroprevalence was 11.5% (95% CI: 9.2, 13.8) for polyvalent immunoglobulins, 10.1% (95% CI: 7.7, 11.9) for IgG, and 1.7% (95% CI: 0.8, 2.6%) for IgM. The seroprevalence was significantly different by gender (P=0.017), but not significantly (P=0.001) with age (OR 1.03, 95% CI 1.01, 1.05). All IgM positive samples originated from Gressier; and the prevalence of IgG was higher in Jacmel than Gressier or Chabian, even after adjustment for age and gender (OR 1.72, 95% CI 1.05, 2.94; P=0.04).

Conclusions-Implications: The detection of both recent (IgM+) and previous (IgG+) exposure to B. pseudomallei provides epidemiological evidence that melioidosis is endemic in Haiti and supports the hypothesis that B. pseudomallei is present throughout the Caribbean. These findings should encourage environmental sampling efforts and increase the level of clinical suspicion for undiagnosed melioidosis cases in Haiti.

Seroepidemiology of Burkholderia pseudomallei, the etiological agent of melioidosis, remains challenging. The objective of this study was to use a serological data collected from a large sample of native Haitians to provide evidence of undiagnosed human melioidosis in Haiti.

Methods: A cross-sectional, seroepidemiological study was conducted using data previously generated with an enzyme-linked immunosorbent assay (ELISA) to detect antibodies toward B. pseudomallei in the native population. Serum originated from asymptomatic population members (n=756) from three clinics in the Ouest Department of Haiti and was screened for polyvalent anti-B. pseudomallei IgM or IgG antibodies. Seroepidemiological population members were defined by a threshold absorbance (O.D.) value, three standard deviations above the sample population average. The number of IgG and IgM positives were tabulated and reported as a percentage. A logistic regression was used to determine the associated between seroprevalence and demographic factors; multiple logistic regression models were used to adjust for potential confounding and included all variables. Results: The population seroprevalence was 11.5% (95% CI: 9.2, 13.8) for polyvalent immunoglobulins, 10.1% (95% CI: 7.7, 11.9) for IgG, and 1.7% (95% CI: 0.8, 2.6%) for IgM. The seroprevalence was significantly different by gender (P=0.017), but not significantly (P=0.001) with age (OR 1.03, 95% CI 1.01, 1.05). All IgM positive samples originated from Gressier; and the prevalence of IgG was higher in Jacmel than Gressier or Chabian, even after adjustment for age and gender (OR 1.72, 95% CI 1.05, 2.94; P=0.04).

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Race/ethnicity and the primary anatomical location of cutaneous melanoma in Florida patients

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Keywords: Melanoma, Dermatology, Ethnicity, Skin Cancer, Sun Protection

Introduction and Objectives: Melanoma is responsible for the majority of skin cancer deaths. Florida ranks second among US states for incidence of melanoma cases. Melanoma has been found to differ in location depending on patients’ race or ethnicity. With Florida’s ethnically diverse population, we sought out to compare the incidence of melanoma by anatomical location amongst the different race/ethnicities.

Methods: We used data from adult patients with melanoma from the Florida Cancer Data System 1988-2014. The independent variable was race/ethnicity [White Non-Hispanic (WH), White Hispanic (WH), and Black Non-Hispanic (BNH)]. The dependent variable was the primary anatomical location of the melanoma (Face, Neck/Scalp, Upper Limbs, Trunk, and Lower Limbs). Multivariate multinomial logistic regression was used to determine the independent associations.

Results: We studied 36,713 melanoma cases. About 97% of patients were White. Among White Non-Hispanics (WHN), 3% were White Hispanics (WH), and less than 1% were Black Non-Hispanics (BNH). About 8% of WH and WHN had melanoma on the face, compared to 3% BNH. About 16% of WH and 23% of WHN had melanoma on the lower limb and hips compared to 62.1% in BNH (p-value =0.001). We found independent associations between race and the anatomical locations of lower limbs and hips (versus face) after adjusting for age, gender, stage at diagnosis, marital status, and health insurance status. As compared to White Non-Hispanics, BNH had 9.95 times higher odds of having melanoma in the lower limbs and hips (odds ratio (OR)= 9.95). Despite this, black showed 21% decreased odds of presenting melanoma in the trunk, and 29% lower odds of presenting melanoma on the upper parts of the limbs and shoulders (OR = 0.8, 95% CI = 0.6-1.0 and OR= 0.7, 95% CI= 0.8-0.9, respectively). Additionally, White Hispanics had higher odds of presenting melanoma on the lower limbs and hips as compared to Whites Non-Hispanics (adjusted OR=1.3, 99% CI= 1-1.6).

Conclusions-Implications: We found differences in the location of melanoma according to race/ethnicity. Physicians should tailor skin exams when screening for melanomas in otherwise low-risk anatomical locations depending on the patient’s race. Keywords: melanoma, primary cutaneous melanoma, anatomical location, race, ethnicity, Hispanic, Non-Hispanic White, Non-Hispanic Black, Florida
These findings support the “obesity paradox” suggesting a moderately high BMI may be protective in recovery. While morbid obesity is a risk factor for increased surgical morbidity, and hysterectomy is a common sequelae of breast cancer therapy, affects up to 200 million people worldwide and 3 million people in the United States. There is currently no curative treatment. Previous studies have demonstrated the efficacy of 9-cis Retinoic Acid, a vitamin A metabolite, in the prevention of secondary lymphedema through its pro-lymphangiogenic properties. The purpose of this study was to determine the minimal effective dosing regimen of 9-cis Retinoic Acid for clinical and functional improvement of postsurgical lymphedema.

Methods: Lymphedema was induced in the tails of 50 C57Bl/6 mice through microsurgical ligation of deep lymphatic vessels. The mice received daily intraperitoneal injections of either 100 µL vehicle solution (90 µL sunflower seed oil/10 µL 100% ethanol) or 0.8 mg/kg 9-cis Retinoic Acid (9-cis RA) dissolved in 100 µL of vehicle solution. The animals were randomly assigned to one of five groups for 45 days following surgery: control (vehicle for 45 days following surgery), 7 day (9-cis RA for 7 days), 14 day (9-cis RA for 14 days), 45 day (9-cis RA for 45 days), and delay (9-cis RA for 7 days beginning one week after surgery). All interventions were administered on post-operative day (POD) 1. POD 45, indocyanine green (ICG) lymphangiography was performed. Lymphatic fluid clearance was quantified over time using ImageJ, and student-t tests were calculated between each group at various time points using GraphPad Prism 7. Animals were photographed every 7 days, and tail diameter was measured using ImageJ. Tail volume was then calculated using a truncated cone formula, and percent change in tail volume was recorded. Animals were sacrificed on POD 47. Tail diameter was measured using ImageJ, and percent change in tail volume was calculated using a truncated cone formula. The tail was then harvested, sectioned, and stained with hematoxylin and eosin. Dermal and epidermal thicknesses were measured using ImageJ. All measurements were taken by a blinded researcher and all statistical analyses were performed using GraphPad Prism 7.

Results: At day 42, tail volume was significantly lower in the 45-day (p<0.001) and delay (p=0.03) groups compared to control. A thinner epidermal layer was also observed in the 7-day (p<0.05), 14-day (p<0.001), 45-day (p<0.001), and delay (p<0.001) groups. Conclusions-Implications: Consistent with our previous studies, 9-cis Retinoic Acid treatment for 45 days resulted in significantly decreased tail volume and improved lymphatic function, as demonstrated by the significantly improved indocyanine green clearance. These results suggest that a dosing regimen involving continuous post-operative 9-cis Retinoic Acid administration may be a useful and efficacious treatment to prevent secondary lymphedema.

Conclusion-Implications: While morbid obesity is a risk factor for developing comorbid conditions and increased surgical morbidity, it appears that a moderately high BMI may be protective in recovery.

Methods: A historical cohort was assembled using data from the CDC’s “Infant Feeding Practices Study and its Year Six Follow-Up” dataset. Records from mother-infant dyads who provided information on variables of interest at the Year 6 Follow-Up survey were included. Exposure was breastfeeding during the first year of age (never breastfed for less than or equal to 6 months, and more than 6 months breastfeeding). Outcomes of interest at the age of six were: a) total number of acute care visits in the preceding year (sick visits + ER visits for acute illness) and b) ER visits for acute illness. By fitting multivariate binomial regression models, crude and adjusted measures of association (incidence rate ratios and 95% confidence intervals) were computed.

Results: Our sample included 1,444 mother-child dyads. After adjusting for potential confounding factors (zero-inflated negative binomial regression for total visits, and Poisson regression for ER visits adjusted for period), we found that when comparing children who were breastfed for 6 months or more and those who were never breastfed, incidence rates of total visits for both acute care and emergency room care decreased by 17% (IRR: 0.83, p = 0.049) and by 47% (IRR: 0.53, p = 0.008) respectively.

Conclusion-Implications: The rates of total acute care visits and ER visits are significantly lower among children of mothers who breastfed for more than 6 months compared to children who never breastfed. While we did not find evidence for effects of breastfeeding for 6 months or less as compared to never breastfeeding, but we cannot rule out such an effect. This highlights the importance of breastfeeding past 6 months for proven long-term health benefits. This may be due, in part, to the impact of extended breastfeeding on immune development. Future research with higher power should test whether there is some effect of shorter breastfeeding duration on long-term immune system. The final objective in this line of research is to reduce child morbidity and the associated burden on the healthcare system.

Keywords: Lymphedema, 9-Cis Retinoic Acid, Lymphangiogenesis

Introduction and Objectives: Secondary lymphedema, a common sequela of breast cancer therapy, affects up to 200 million people worldwide and 3 million people in the United States. There is currently no curative treatment. Previous studies have demonstrated the efficacy of 9-cis Retinoic Acid, a vitamin A metabolite, in the prevention of secondary lymphedema through its pro-lymphangiogenic properties. The purpose of this study was to determine the minimal effective dosing regimen of 9-cis Retinoic Acid for clinical and functional improvement of postsurgical lymphedema.

Method: A retrospective cohort study was conducted from data provided by the American College of Surgeons National Surgical Quality Improvement Program, which comprised of 21,356 patients that underwent a total laparoscopic hysterectomy in 2016. Medical records were reviewed for patient demographics, history of chronic conditions, and presence of intra/postoperative complications. The main independent variable, body mass index, was stratified into groups according to the current WHO BMI classification (normal: 18.5-24.9 kg/m², overweight: 25.0-29.9 kg/m², obese I: 30-34.9 kg/m², obese II: 35-39.9 kg/m², obese III: >40 kg/m²). The primary outcome was measured by the presence of intra/postoperative complications. Unadjusted and adjusted logistic regression models were used to calculate odds ratios (OR) and 95% confidence intervals (CI).

Results: There was a decrease in odds of complications in Obese I patients compared with normal weight patients (OR:0.9, 95% CI: 0.9-0.9). The percentage of complications was highest among patients in the obese III category. The subpopulations with increased odds of complications were those that were postmenopausal (OR:1.3, 95% CI 1.1-1.4), black (OR:1.4, 95% CI 1.2-1.6), or had a chronic hypertension (OR:1.3, 95% CI 1.2-1.5), COPD (OR:1.9, 95% CI 1.3-2.8), disseminated cancer (OR:2.8, 95% CI 1.8-4.1), and bleeding disorders (OR:4.2, 95% CI 3.0-5.9).

Conclusion-Implications: While morbidity obesity is a risk factor for developing comorbid conditions and increased surgical morbidity, it appears that a moderately high BMI may be protective in recovery. These findings support the “obesity paradox” suggesting a moderately high BMI may be protective in recovery.
IL-21 is a necessary component for optimal heterosubtypic immunity against influenza virus

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Introduction and Objectives: The aim of current influenza A virus (IAV) vaccines is to induce neutralizing antibodies against surface proteins of circulating IAV strains. This type of protection, known as ‘homotypic’ immunity, is only effective against IAV subtypes recognized by these neutralizing antibodies, and fails to protect if the vaccine does not match circulating IAV strains. However, it is well established that T cells can also provide immunity against IAV and, unlike antibodies, T cells can recognize internal viral proteins shared across diverse IAV subtypes. This form of protection is known as ‘heterosubtypic’ immunity. The cytokine interleukin 21 (IL-21) is best known to aid in optimal immunity by stimulating development of antibody responses. However, IL-21 also plays diverse roles in some models of infection in the function and survival of anti-viral T cells. Here, we examine the role of IL-21 in murine models of homotypic and heterosubtypic immunity against IAV.

Methods: Wild type (WT) or IL-21 receptor knock-out (IL-21r−/−) C57BL/6 mice were primed with a sub-lethal dose of the mouse-adapted IAV strain A/PR8 (H1N1) and challenged 28 days later with a lethal dose of A/PR8, or of the heterosubtypic IAV strain A/Philippines (H3N2). After challenge, mice were monitored for weight loss and morbidity. In addition, to model current inmunaral vaccine strategies, mice were primed with the cold-adapted, attenuated vaccine strain A/Alaska (H3N2) and challenged after 28 days with a lethal dose of A/PR8/ or A/Philippines. To directly assess the role of IL-21 in viral clearance, pulmonary IAV titers were determined after heterosubtypic challenge by quantitation of viral copy number.

Results: We saw no impact of IL-21 on weight loss or recovery during priming of WT and IL-21r−/− mice. Similarly, primed IL-21r−/− mice were equally protected when challenged with a lethal dose of homotypic IAV compared to WT controls. However, following heterosubtypic challenge, IL-21r−/− mice showed increased weight loss and mortality versus WT controls. Similar patterns were seen after heterosubtypic challenge of mice primed with PR8 or vaccinated with A/Alaska. Finally, decreased protection in the primed IL-21r−/− mice correlated with increased viral titers compared to WT mice.

Conclusions: Implications: Surprisingly, although IL-21 is best known in supporting maximal antibody responses, IL-21r−/− mice showed no defects in homotypic immunity against IAV. Unexpectedly, the primed IL-21r−/− mice displayed increased weight loss and death following heterosubtypic challenge. These studies indicate that IL-21 may contribute more to mechanisms associated with heterosubtypic rather than homotypic immunity. Understanding how to best stimulate T cell-dependent heterosubtypic immunity may aid in the development of improved IAV vaccines. Therefore, our future studies will examine how IL-21 signals impact the generation and function of protective heterosubtypic CD8 and CD4 T cell responses against IAV.

Investigation of fanconi anemia pathway downstream genes

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Introduction and Objectives: A key response mechanism to DNA damage is the Fanconi Anemia repair pathway (FA), which involves homologous recombination DNA repair and is activated through mono-ubiquitination of FANCD2. Impaired regulation of DNA repair results in genomic instability. FANCD2 is considered to promote cell growth through interactions with cell proliferation pathways. We hypothesize that FA deficient tumors have a low growth rate and reduced ability for DNA repair compared to FA functioning tumor cells. We aim to explore the association between the FA repair pathways and downstream genes involved in cell cycle regulation that influence tumor growth.

Methods: To generate FANCD2 knockdown cells, human lung cancer cell lines A549 and H1299 were transduced with FANCD2-specific short hairpin RNA (shRNA) expressing and puromycin-resistant lentiviral particles or control shRNA lentiviral particles. The cells were cultured in growth medium, and successful FANCD2 knockdown was confirmed by western immunoblot analysis. RNA deep sequencing was completed with Illumina RNA-Seq. We compared gene expression between knockdown FANCD2 and control samples across three cell lines and ranked significant gene expression changes, defined as a five-fold change in upregulation or downregulation. The fold change was calculated by dividing FANCD2 deficient expression by FANCD2 efficient expression.

Results: 13436 genes were evaluated across three cell lines and 17 genes demonstrated gene expression change by at least 5-fold with FANCD2 knockdown in all three cell lines. FANCD2 knockdown resulted in 14 downregulated genes and 3 upregulated genes. The downregulated genes RPS14, RPL11, B23, KIF4A, C12orf54, and BMS1P17 demonstrated significant expression change across three cell lines. Of the 14 downregulated genes, 13 genes had literature supporting oncogenic function. Each upregulated gene had literature supporting oncogenic function.

Conclusions: Implications: As FANCD2 is considered to promote cell proliferation, downregulation of oncogenic genes expression was expected with FANCD2 knockdown. However, the literature suggested that the 3 upregulated genes with FANCD2 knockdown also have oncogenic function. These genes may have other functioning beyond the scope of carcinogenesis which may explain...
gene upregulation with FANCDD2 knockdown. Pinpointing genes related to the functional deficiency of the FA pathway may lead to a better understanding of genetic and epigenetic phenomena that drive cancer in these patients. Our results provide a starting point for developing targets to specific downstream genes associated with the FA pathway. Further investigation is needed to determine how FANCDD2 interacts with these genes to promote cell proliferation.

P3

Morphological constancy of olfactory sensory neuron cilia in rodents

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Keywords: Olfaction, Cilia, Therapy

Introduction and Objectives: Olfaction allows perception of our chemosensory environment. All odorant receptors and signal transduction molecules are compartmentalized in the cilia of olfactory sensory neurons (OSNs). Shortening or loss of olfactory cilia as the result of disease impairs odor detection illustrating their critical role in olfactory function. Although we understand that olfactory cilia has grown, it remains unclear whether cilary morphology changes under varying conditions. Utilizing adenoviral eGFP expression and live confocal imaging, we therefore aimed to measure cilia length and number in olfactory epithelium under various conditions. Overall expanding our knowledge of the structural features of olfactory cilia will provide us with a reference to understand structure-function relationship between cilia morphology and odorant detection.

Methods: In Face. Mice were anesthetized, decaptitated, and split along the cranial midline. The olfactory epithelium was isolated and placed on a surface bath in a 1x PBS in the imaging chamber. Samples were imaged on a Nikon TiE-EFR Confocal microscope. Ciliary Measurements. The turbinate were identified through the microscope (1x) under epifluorescence. Individual OSNs with intact cilia were identified based on Alexa-labeled cilia (anti-Myosin-VI) staining. Confocal z stack images of OSNs were collected at 60x. Cilium length and count measurements were performed on ImageJ.

Results: Mean cilia length and number per OSN showed no significant difference across all regions (F(7,137)=2.789, p=0.0096). The mean cilia length per OSN, and number per OSN showed no significant difference between male and females (t(136)= 1.39); (t(136)= 1.87). The mean cilia length and number per OSN showed a significant difference among the various strains of mice. In addition, paratomaldehyde fixation can disrupt cilia length and number per OSN. By accurately classifying OSN cilia morphology, we hope to gain insight regarding the processing of olfactory input and cilia length as their presence in the OE is crucial for odor detection.

Conclusions-Implications: Our studies demonstrate a differential impact of IL-2 on immune cell subsets in secondary lymphoid organs versus gut associated lymphoid tissues. Our future goal is to determine if IL-2 acts directly on B cells and if it impacts only certain B cell subsets in Peyer’s Patches, as some studies suggest that changes in B cells may contribute to development of CD. Thus, this study may aid in defining new ways in which IL-2 can contribute to disease ecology, and also lead to novel treatments for CD.

P4

Determining differential effects of interleukin-2 on immune cells in lymphoid organs and the gastrointestinal tract

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Keywords: IL-2, Crohns Disease, GI Tract, Immune Cells

Introduction and Objectives: Interleukin-2 (IL-2) is a pleiotropic cytokine that is used to treat a variety of immune-related disorders. While the effects of IL-2 can be beneficial in the treatment of cancer, there are potential side effects including gastrointestinal toxicity. Recent studies have indicated that IL-2 can also impact the gut and gut associated lymphoid tissues. The purpose of this study was to investigate the impact of IL-2 on immune cells and subtypes in lymphoid organs and the gastrointestinal tract.

Methods: C57BL/6 mice were injected with IL-2 (5 x 10^6 IU) or phosphate buffered saline (PBS) via tail vein. Control mice were injected with PBS alone. After 24 hours, mice were euthanized and spleen, mesenteric lymph nodes, and small and large intestines were collected. Cytokine expression was assessed using qRT-PCR. Results were recorded and analyzed using GraphPad Prism 7.

Results: While we confirmed previously observed changes and trends in cytokine expression in secondary lymphoid organs driven by IL-2 complexes, very few changes were seen in the gut and gut-associated lymphoid tissues. Unexpectedly, a sharp decline was seen in B cells, most notably in Peyer’s Patches. Our data furthermore indicates that B cells in IL-2 treated mice undergo enhanced apoptosis in Peyer’s Patches.

Conclusions-Implications: These studies demonstrate a differential impact of IL-2 on immune cell subsets in secondary lymphoid organs versus gut associated lymphoid tissues. Our future goal is to determine if IL-2 acts directly on B cells and if it impacts only certain B cell subsets in Peyer’s Patches, as some studies suggest that changes in B cells may contribute to development of CD. Thus, this study may aid in defining new ways in which IL-2 can contribute to disease ecology, and also lead to novel treatments for CD.

P5

Vascularized lymph nodes flap ischemia results in upregulation of CXCL1/GRO-alpha

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Keywords: Lymphatics, Ischemia, Reperfusion, Flap

Introduction and Objectives: Free vascularized lymph node transfer (VLNT) has been shown to be an effective treatment modality for lymphedema. While limited flap ischemia is inevitable, prolonged ischemia induces a cascade of deleterious effects that can negatively affect outcomes. To date, there is a paucity of literature regarding the histologic and functional response to ischemia and reperfusion. The objective of this study was to test the hypothesis that prolonged ischemia will upregulate CXCL1/GRO-alpha.

Methods: P16INK4a expression in residual stem cell-like cells was assessed in which IL-2 can contribute to disease etiology, and also lead to novel treatments for CD.

Conclusions-Implications: While some changes in gene expression were observed after 1 hour of ischemia, they did not become statistically significant until after 2 hours: CXCL1/GRO-alpha (40x increase, p<0.001), nuclear p16 (4x increase, p<0.001), and TNF-alpha was upregulated after 4 hours (4x increase, p<0.05). Ischemia followed by reperfusion for 5 days, demonstrated that of an ischemic induced increase in CXCL1/GRO-alpha expression returned to baseline levels whereas levels of MUC1, PECAM-1, and TNF-alpha remained elevated.

Conclusions-Implications: In lymphatic tissue, ischemia induces significant changes in gene expression after as little as 2 hours of ischemia, leading to a rapid increase in CXCL1/GRO-alpha, and reperfusion returns expression levels of CXCL1/GRO-alpha back to baseline. In VLNT, surgeons should aim to keep ischemia time less than 2 hours as a CXCL1/GRO-alpha may be a useful bio-marker to monitor ischemia in LN flaps.

P6

Neoadjuvant chemotherapy is associated with therapy-induced senescence of neoplastic and stromal cells and loss of P16INK4a expression in residual stem cell-like (CD44+ ) hormone-receptor-negative breast cancer

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Keywords: Senescence, Breast Cancer, P16, CD-44, Chemotherapy

Introduction and Objectives: Cellular senescence is a stress response associated with P16-mediated cell arrest and the acquisition of a secretory phenotype that can promote tumor progression. Hormone-receptor-negative breast cancers (HRNBCs) can show aberrant expression of P16. We aimed to assess the impact of neoadjuvant chemotherapy (CT) on P16-mediated senescence in breast cancer specimens.

Methods: P16 and CD-44 (stem cell marker) were evaluated by immunohistochemistry (IHC) in primary tumors from 20 HRNBCs, of whom 15 were treated with P1-CT in a cohort of 21 women with HRNBCs. P16 positivity was estimated by calculating cellular densities on hotspots using ImageJ 1.51i (National Institutes of Health, USA).

Results: All pre-CHPRBCs (n=18) showed nuclear and cytoplasmic P16 expression in variable proportions. There were no significant differences in pre-CT CD-44 and p16 expression between HRNBCs with complete (n=10) versus incomplete (n=8) pathologic response. In general, 48% of all tumors were positive for P16 (1.5x, P<0.05) while CD-44 expression (6/9, P<0.05) increased after Ct. Post-CT changes correlated with pre-CT tumor positivity (n=27 for P16, n=8 for CD-44). There was accumulation of senescent

POSTER ABSTRACTS
P7

A long noncoding RNA of lung epithelial cells in cigarette smoke-associated COPD

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Keywords: COPD, Non-Coding RNA, Airway Epithelial Cells, Mucosa, Cigarette Smoke

Introduction and Objectives: Airway epithelial cells (AECs) are crucial for lung innate immunity and any dysregulation in AECs can lead to hyperresponsive mucous response that is often observed in toxicants (e.g., cigarette smoke, CS)-associated COPD. Therefore, studies were conducted to help understand the mechanical mechanisms responsible for the cigarette smoke (CS)-associated lung pathologies of the COPD patients.

Methods: RNAseq analysis of AECs was conducted to identify mucosa-associated long non-coding RNA (lncRNA) species. The RNA-seq data was validated by qRT-PCR analysis of air-liquid interface cultured AECs that were exposed to CS extract (CSE). The age- and gender-matched primary human lung epithelial cells (Lung Tissue Research Consortium, NH) from COPD smokers with varying disease severity of GOLD (Global Initiative on COPD) stage 1, 2, 3 or 4 were analyzed for lncRNA expression. Mucosa was analyzed by Alcian blue histochemical staining and by qPCR analysis of the splice variants. CSE treatment of AECs showed an increase in the tissue levels. Most importantly, airway sections from GOLD stage-2 and stage-3 COPD that had increased mucous expression in airways also showed higher expression of IncRNA A205 exon 8 transcripts. FISH analysis using the RNAscope® technology demonstrated predominant localization of IncRNA A205 in the epithelial airway tissue of the GOLD stage-3 COPD patients.

Conclusions-Implications: Here, we report that a novel AEC- specific IncRNA could be responsible for the CS-associated mucous hyperactivity in COPD patients. Studies are underway to investigate the role of the newly identified IncRNA in COPD. Furthermore, phosphor-2 AMBIC can be regulated by modulating this IncRNA using gain- or loss-of-function strategies. These results will thus provide a key foundation toward understanding the molecular mechanisms by which IncRNAs modulate airway epithelial responses and COPD pathogenesis.

P8

Isolation and characterisation of slow-cycling tumour initiation cells in mouse model of iGBM

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Keywords: Immunotherapy, Glioblastoma, Cancer Stem Cell, KRT15

Introduction and Objectives: Glioblastoma (GBM) is an aggressive brain tumor that carries a fatal prognosis in almost all cases. Despite the poor one and five-year survival rates (36.5% and 5% respectively) what is most alarming is the speed at which GBM recurrences take place after treatment in patients with newly diagnosed GBM. Glioblastoma can be divided into two subtypes: high-grade and low-grade gliomas. Glioblastoma is characterized as a slow-cycling cancer stem cell model in an immunocompetent mouse model of glioma to test different immunological targeting approaches in subsequent animal studies.

Methods: We identified a potential tumour cell line which accurately recapitulates what is observed in human cell models of GBM. Using FACS based on CellTrace Violet (CTV) retention, we separated the slow and fast cycling KRT15+Luciferase cells. Then we determined the slow cycling cells are far more resistant to temozolomide (TMZ) than fast cycling cells through multiple proliferation assays: MTT, CyQyant, Sphere forming assay, and propidium iodide incorporation. Finally, in-vivo animal studies were done to compare tumorigenic potential of each cell subtype.

Results: All proliferation assays produced statistically significant differences between slow-cycling cells (SCC) and fast-cycling cells (FCC). MTT (p<0.01, n = 12), CyQyant (p<0.01, n = 12), Sphere forming assay (p<0.01, n = 120), and PI incorporation (p<0.001). The EC50 dose of TMZ for the KRT15 cell line was estimated to be 20 μM. No activity was detected for K-HG2 cell culture (1 mM vs 0.3 mM, respectively). Further, we show the slow cycling-cells are also more tumorigenic both in vitro and in vivo suggesting they are principle the tumor initiating cells which is the observation in human models.

Conclusions-Implications: We concluded that the KRT15+/Luciferase cell line is an adequate murine model of slow cycling GBM cells. Further, we determined these slow cycling cells are more resistant to therapy and successful isolation and removal of these cells is often by as much as 45%. With these findings, we can continue using this cell line for testing various immunotherapeutic targeting modalities in immunocompetent animal models for evaluation of GBM therapies.

P9

Neurocognitive status of aviremic HIV+ subjects is associated with proteomic content of plasma/CSF-derived exosomal extracellular vesicles

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Keywords: Exosomes, Human Immunodeficiency Virus (HIV), Neurocognitive Status

Introduction and Objectives: Despite successful suppression of HIV viral load by antiretroviral therapy (ART) to undetectable levels, many aviremic HIV-infected individuals still develop neurocognitive deficits. The mechanism of HIV-associated neurocognitive deficits (HAND) is not clearly understood. New neurocognitive impairments have emerged in HIV patients in the past 40 years. However, recently the efficacy of immunological targeting modalities in immunocompetent animal models of slow-cycling glioblastoma cells. Further, we determined these slow cycling cells are more resistant to therapy and successful isolation and removal of these cells is often by as much as 45%. With these findings, we can continue using this cell line for testing various immunotherapeutic targeting modalities in immunocompetent animal models for evaluation of GBM therapies.

Conclusions-Implications: We concluded that the KRT15+/Luciferase cell line is an adequate murine model of slow cycling GBM cells. Further, we determined these slow cycling cells are more resistant to therapy and successful isolation and removal of these cells is often by as much as 45%. With these findings, we can continue using this cell line for testing various immunotherapeutic targeting modalities in immunocompetent animal models for evaluation of GBM therapies.

In conclusion the proteomic content

Conclusions-Implications: We concluded that the KRT15+/Luciferase cell line is an adequate murine model of slow cycling GBM cells. Further, we determined these slow cycling cells are more resistant to therapy and successful isolation and removal of these cells is often by as much as 45%. With these findings, we can continue using this cell line for testing various immunotherapeutic targeting modalities in immunocompetent animal models for evaluation of GBM therapies.

Results: Overall proteomic content of CSF- and serum-derived exosomes did not differ significantly between normal, HAND and ANI subjects. However, the amount of proteins such as transferrin (TREP), apolipoprotein A1 (APOA1), alpha-2 macroglobulin (A2M), and the HIV Nef protein did significantly increase in CSF- and serum samples from subjects with HAND/ANI compared to subjects without deficits.

Conclusions-Implications: In conclusion the proteomic content of CSF- and serum-derived exosomes can be a specific and functional biomarker of in vivo HIV-infected subjects. This suggests that the exosomal proteome associated with neurocognitive status can also be monitored as a diagnostic tool of neurocognitive status in the aviremic HIV-infected subject. Taken together the findings demonstrated that exosomal protein content varied with neurocognitive status in the aviremic HIV-infected patient and that exosomal protein profiling has the potential to be a “bench-to-bedside-to-bench” approach in which neurocognitive impairment/ fluctuation in aviremic HIV+ patients can be monitored.

P10

Sugar-sweetened beverage consumption effect on cholesterol levels among U.S. adults

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Keywords: Sugar-Sweetened Beverages, Cholesterol, Hyperlipidemia, Metabolic Syndrome, Diabetes

Introduction and Objectives: Sugar-sweetened beverages (SSB) are the leading source of added sugar in the American diet, and a major contributor to adult and childhood obesity. The intake of SSB has shown to be independently associated with increased BMI, waist circumference, HDLc, and insulin resistance. In addition, recently, there has been an increased interest in understanding the role of SSB in weight gain and adverse health risk factors, including hypercholesterolemia. The purpose of this study was to determine whether there is an association between the consumption of sugar-free beverages and reported hypercholesterolemia in U.S. adults.

Methods: We conducted a cross-sectional study based on secondary analysis of the 2017 data from the Behavioral Risk Factor Surveillance System (BRFSS) in ten U.S. states. The exposure variable was defined as reporting daily soda and sugary drinks consumption in the last 30 days. The outcome variable was reporting hypercholesterolemia. We initially performed an analysis of the distribution of selected demographics and comorbidities according to the main exposure and outcome variables. We then performed a multivariate analysis utilizing a binary logistic regression approach to adjust for potential confounders.

Results: Our sample included 46,853 adults. The unadjusted logistic regression indicated that consuming between 0-1 SSB daily had a 25% lower odds of having hypercholesterolemia (OR=0.75, 95%CI:0.69-0.81) compared to no SSB consumption, and a 41% decrease in the odds of hypercholesterolemia (OR=0.59, 95%CI:0.43-0.81) in the SSB consumers compared to no SSB consumers.

Conclusions-Implications: In conclusion the proteomic content of CSF- and serum-derived exosomes can be a specific and functional biomarker of in vivo HIV-infected subjects. This suggests that the exosomal proteome associated with neurocognitive status can also be monitored as a diagnostic tool of neurocognitive status in the aviremic HIV-infected subject. Taken together the findings demonstrated that exosomal protein content varied with neurocognitive status in the aviremic HIV-infected patient and that exosomal protein profiling has the potential to be a “bench-to-bedside-to-bench” approach in which neurocognitive impairment/ fluctuation in aviremic HIV+ patients can be monitored.
Our study included 2,965 patients (45% women) with cardiovascular risk factors such as obesity, hyperlipidemia, diabetes, hypertension, AMI and in-hospital mortality while controlling for age, smoking and other confounders. We utilized multivariate logistic regression analysis to identify the association between anatomical location of septal and indeterminate AMI. Patients from the Puerto Rican Cardiovascular Health Study (PRCHS), which is to examine the association of anatomical location of AMI and its relation with the diagnosis of diabetes or other chronic diseases, was utilized to evaluate this relationship. Published scientific literature has associated diabetes and other chronic diseases with increased odds of in-hospital mortality, and AMI location may be associated with these outcomes.

Our objective was to investigate whether the anatomical location of AMI is associated with increased odds of in-hospital mortality. We hypothesized that patients with septal AMI would have higher odds of in-hospital mortality compared to those with indeterminate location, independent of other confounders such as age, gender, obesity, hyperlipidemia, diabetes, hypertension, AMI, and in-hospital mortality.

Conclusions-Implications: Although our findings failed to demonstrate an association between in-hospital mortality and anterior AMI location or gender, further research is warranted with an older, at-risk population.

P12
Lowest fasting blood glucose (FBG) in a prediabetic individual with HIV despite struggle with weight control management

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Introduction and Objectives: HIV infection has previously been associated with malnutrition and wasting; however, with the initiation of antiretroviral therapy (ART), a growing number of people living with HIV (PLWH) are becoming centrally obese, with disproportionate weight accumulation around the abdominal area and fat losses in the rest of their body (periphery, arms and legs), indicative of lipodystrophy. As a result, some PLWH have a higher risk of developing diabetes than the general non-HIV infected population, primarily due to HIV infection as well as the chronic use of antiretroviral therapy (ART). The objective of this study is to assess the effectiveness of a 6-month nutrition intervention to improve glycemic parameters and inflammation in prediabetic PLWH on stable ART with undetectable HIV viral load.

Methods: A 6-month randomized, controlled nutrition intervention was conducted in prediabetic PLWH. The study participants were selected based on high fasting blood glucose levels (FBG ≥ 100 mg/dL), to be randomized at the FIU-Borinquen Research Clinic. Upon their consent, the participants were randomized into the intervention group or the control group. Participants randomized in the intervention group met once a month for approximately 1 hour for 6 months, while those in the control group received educational material at baseline. Participants were instructed to maintain their weight but were encouraged to increase their physical activity and to follow a healthy diet. Blood was drawn at baseline and at the 6-month follow-up.

Conclusions-Implications: Despite the participant’s difficulties in weight management, fasting blood glucose (FBG) improved throughout the intervention, with a 30% decrease in FBG from baseline to the 6-month follow-up (p=0.002). Despite the participant’s difficulties in weight management, fasting blood glucose (FBG) improved throughout the intervention, with a 30% decrease in FBG from baseline to the 6-month follow-up (p=0.002). Conclusion: The results of this intervention support the notion that a nutrition intervention is effective in prediabetic PLWH to lower diabetes risk by significantly lowering fasting blood glucose and may be implemented into larger scale interventions; however, no significant changes was seen in hs-CRP values between the 2 groups.

P14
Racial disparity in survival for women with ovarian cancer

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Keywords: Race, Ethnicity, Disparity, Survival, Ovarian Cancer

Introduction and Objectives: Ovarian cancer is the fifth-leading cause of cancer-related mortality in United States women. Previous studies have documented disparities in survival between non-Hispanic black (NHB) and non-Hispanic white (NHW) women. This study aimed to assess if insurance status and extent of disease were effect modifiers of the survival difference between NHW and NHB women diagnosed with ovarian cancer from 2007 to 2015.

Methods: A secondary data analysis of the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) program from 2007-2015 was performed. Participants were selected based on postmenopausal status (age over 51 years), NHB and NHW race/ethnicity, stage, histology, and treatment for ovarian cancer. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. The race by ethnicity interaction for cause-specific mortality was not statistically significant.

Conclusions-Implications: We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. The race by ethnicity interaction for cause-specific mortality was not statistically significant.

P15
Effectiveness of a 6-month nutrition intervention in lowering diabetes risk in prediabetic people living with HIV (PLWH) in MASH cohort

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Keywords: HIV, Diabetes, Nutrition Intervention, Fasting Blood Glucose

Introduction and Objectives: People living with HIV (PLWH) have a higher risk of developing diabetes than the general non-HIV infected population, primarily due to HIV infection as well as the chronic use of antiretroviral therapy (ART). The objective of this study is to assess the effectiveness of a 6-month nutrition intervention to improve glycemic parameters and inflammation in prediabetic PLWH on stable ART with undetectable HIV viral load.

Methods: A 6-month randomized, controlled nutrition intervention was conducted in prediabetic PLWH. The study participants were selected based on high fasting blood glucose levels (FBG ≥ 100 mg/dL), to be randomized at the FIU-Borinquen Research Clinic. Upon their consent, the participants were randomized into the intervention group or the control group. Participants randomized in the intervention group met once a month for approximately 1 hour for 6 months, while those in the control group received educational material at baseline. Participants were instructed to maintain their weight but were encouraged to increase their physical activity and to follow a healthy diet. Blood was drawn at baseline and at the 6-month follow-up.

Conclusions-Implications: Despite the participant’s difficulties in weight management, fasting blood glucose (FBG) improved throughout the intervention, with a 30% decrease in FBG from baseline to the 6-month follow-up (p=0.002). Conclusion: The results of this intervention support the notion that a nutrition intervention is effective in prediabetic PLWH to lower diabetes risk by significantly lowering fasting blood glucose and may be implemented into larger scale interventions; however, no significant changes was seen in hs-CRP values between the 2 groups.

P14
Racial disparity in survival for women with ovarian cancer

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Keywords: Race, Ethnicity, Disparity, Survival, Ovarian Cancer

Introduction and Objectives: Ovarian cancer is the fifth-leading cause of cancer-related mortality in United States women. Previous studies have documented disparities in survival between non-Hispanic black (NHB) and non-Hispanic white (NHW) women. This study aimed to assess if insurance status and extent of disease were effect modifiers of the survival difference between NHW and NHB women diagnosed with ovarian cancer from 2007 to 2015.

Methods: A secondary data analysis of the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) program from 2007-2015 was performed. Participants were selected based on postmenopausal status (age over 51 years), NHB and NHW race/ethnicity, stage, histology, and treatment for ovarian cancer. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. The race by ethnicity interaction for cause-specific mortality was not statistically significant.

Conclusions-Implications: We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. The race by ethnicity interaction for cause-specific mortality was not statistically significant.

P15
Effectiveness of a 6-month nutrition intervention in lowering diabetes risk in prediabetic people living with HIV (PLWH) in MASH cohort

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Keywords: HIV, Diabetes, Nutrition Intervention, Fasting Blood Glucose

Introduction and Objectives: People living with HIV (PLWH) have a higher risk of developing diabetes than the general non-HIV infected population, primarily due to HIV infection as well as the chronic use of antiretroviral therapy (ART). The objective of this study is to assess the effectiveness of a 6-month nutrition intervention to improve glycemic parameters and inflammation in prediabetic PLWH on stable ART with undetectable HIV viral load.

Methods: A 6-month randomized, controlled nutrition intervention was conducted in prediabetic PLWH. The study participants were selected based on high fasting blood glucose levels (FBG ≥ 100 mg/dL), to be randomized at the FIU-Borinquen Research Clinic. Upon their consent, the participants were randomized into the intervention group or the control group. Participants randomized in the intervention group met once a month for approximately 1 hour for 6 months, while those in the control group received educational material at baseline. Participants were instructed to maintain their weight but were encouraged to increase their physical activity and to follow a healthy diet. Blood was drawn at baseline and at the 6-month follow-up.

Conclusions-Implications: Despite the participant’s difficulties in weight management, fasting blood glucose (FBG) improved throughout the intervention, with a 30% decrease in FBG from baseline to the 6-month follow-up (p=0.002). Conclusion: The results of this intervention support the notion that a nutrition intervention is effective in prediabetic PLWH to lower diabetes risk by significantly lowering fasting blood glucose and may be implemented into larger scale interventions; however, no significant changes was seen in hs-CRP values between the 2 groups.

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Methods: A secondary data analysis of the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) program from 2007-2015 was performed. Participants were selected based on postmenopausal status (age over 51 years), NHB and NHW race/ethnicity, stage, histology, and treatment for ovarian cancer. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. We found evidence for greater cause-specific mortality among NHB women but only in patients with stage III disease. The race by ethnicity interaction for cause-specific mortality was not statistically significant.

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The association between race/ethnicity and cancer stage at diagnosis of bone malignancies

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Keywords: Bone Malignancy, Cancer Stage, Disparity, Ethnicity

Introduction and Objectives: Evidence has shown disparities and delays in diagnosis of both breast and colorectal cancers in both Black and Hispanic populations when compared to White patients. The aim of this study was to examine disparities in diagnosis in regards to primary bone neoplasms (PBN). The objective of our study was to determine if there is an association between race/ethnicity and advanced stage of diagnosis of PBN.

Methods: This population-based retrospective cohort study included patient demographic and health information extracted from the NCI Surveillance, Epidemiology, and End Results Program (SEER). Our patient population includes patients less than 65 years of age with a diagnosis of PBN (osteoosarcoma, Ewing sarcoma, chondrosarcoma, and giant cell tumor) from 1973-2014. The main exposure variable was race/ethnicity categorized as Non-Hispanic Whites (NH-W), Non-Hispanic Black (NH-B), Non-Hispanic Asian Pacific Islander (NH-API), and Hispanic. The main outcome variable was advanced stage at diagnosis. Age, sex, tumor grade, type of bone cancer, decade and geographic location were added as co-variates to the statistical models. Unadjusted and adjusted logistic regression analysis were conducted. Odds ratios (OR) and their corresponding 95% confidence intervals were calculated.

Results: The adjusted hazard ratios for 5-year overall survival stratified by insurance status indicated that Blacks with any Medicaid were 1.44 times more likely to die of bladder cancer (95% CI 1.22-1.51) compared with Whites. The corresponding hazard of death in uninsured Blacks was 1.30 (95% CI 1.10-1.59). However, there was a statistically significant difference between race and survival between insured Black and insured White patients (HR 1.10; 95% CI 0.85-1.25) from 1973-2014 compared to Whites among the insured and any Medicaid categories. However, the uninsured API group had increased survival (HR 0.71 95% CI 0.51-0.93) compared with uninsured White patients.

Conclusions-Implications: While race is accepted as a poor prognostic factor in the mortality from bladder cancer, insurance status may help to explain some of the disparities in mortality between races for patients with bladder cancer.
The association between household income and childhood depression in American children aged 5–18 years old

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Keywords: Depression, Household Income Level, Poverty Levels, Childhood, Prevalence

Introduction and Objectives: Childhood depression is an under-recognized illness that can have long-term detrimental effects. Risk factors should be studied in order to identify children who could benefit from early interventions. Our research question is testing the association between a family's income level and childhood depression.

Methods: This is a cross-sectional study using data collected in the 2011 National Survey of Children's Health, a telephone survey conducted to households in the United States. We stratified household income into eight categories in relation to poverty level and tested the association between the presence of childhood depression, and other possible confounders. Childhood depression was determined using the question "has a doctor or other healthcare provider ever told you that [child] had depression?". To adjust for the potential confounders, we used multivariate regression analysis.

Results: 62,950 of the 95,677 responses were included. The survey conducted to households in the United States. With family incomes that qualify for Marketplace tax subsidies (301-400%), the adjusted odds ratios were 2.8 (95% CI 1.9-4.1). Similarly, the adjusted depression rates were 154-180%, 201-300%, and 301-400%. The adjusted odds ratios and corresponding 95% confidence intervals.

Results: We studied 4,090 eligible respondents. About 9.2% had Marketplace insurance. The odds of having Marketplace insurance over ESI were higher for participants: 46-64 years old [compared to those 75 years and older], who were employed (vs. unemployed). The adjusted odds ratios and corresponding 95% confidence intervals (CI) were: with incomes lower than 300% of FPL, OR=3.8, 95%CI=2.6-5.5 for the income group 100-199% of FPL; and OR=4.3, 95%CI=2.6-6.8 with incomes above 200% of FPL.

Results: The recovery of donor memory CD4 T cells in all organs of the spleen, draining lymph nodes, and lung was determined in congenic BALB/c hosts that were subsequently challenged with lethal doses of influenza A virus. The results showed that the transferred donor CD4 T cells in spleens, draining lymph nodes, and lungs were enumerated by flow cytometry.

Conclusions-Implications: This study highlights that, after adjusting for potential confounders, several household income levels are associated with increased odds of childhood depression.

Conclusions-Implications: Memory CD4 T cell recall responses against influenza A virus are retained during pregnancy.

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Keywords: Immunological Memory, CD4 T Cells, Influenza A Virus, Pregnancy

Introduction and Objectives: Despite widespread annual vaccination, Influenza A virus (IAV) remains a global health concern. Serious illness can occur in susceptible individuals including children, the elderly and pregnant women. The physiological changes associated with pregnancy are well known to cause alterations in the immune system. Maternal infection during pregnancy has the potential to affect the generation of humoral or antibody responses at the cost of cell mediated immunity. The latter is essential for anti-viral immune responses. While much is known about alterations to the generation of primary immune responses, how memory or secondary immune responses, such as those induced by vaccination, are impacted during pregnancy is unexplored. We examine here, the responsive capacity of memory CD4 T cells specific for influenza A virus in gravid and non-gravid hosts during recanal infection.

Methods: Timed-pregnant female BALB/c mice and non-gravid controls were adoptive transfer recipients of in vitro generated IAV-specific CD4 T cell T cells. CD4 T cell T cells were co-transferred with sublethal doses of A/PuertoRico/8/1934 (PR8) virus. Briefly, naive HCT CD4 T cell T cell receptor transgenic cells, which are specific for a peptide of the hemagglutinin of PR8, were isolated and polarized in vitro to generate the Th1+ CD4+ effectors that were subsequently rested to generate memory CD4 T cells (rested effectors). On day 7 post infection, the number of donor memory cells, surface expression of CD127 (IL-7 receptor), and production of the cell- mediated response associated cytokines IFN-g, TNF, and IL-2 in the spleen, draining lymph nodes, and lung was determined in recipient hosts by flow cytometry. The fetal outcomes in similarly treated animals and unmanipulated controls were also monitored.

Results: Cryopreserved and thawed in vitro-generated CD4a memory T cells, both untreated and cultured for 24 hrs with cytokines IL-7 or IL-7 and IL-2, mediate protection against lethal doses of IAV. Enhanced recovery as early as day 5 post infection is seen with thawed cells cultured overnight with IL-7 as well as the combination of IL-7 and IL-2. At day 7 post-infection, donor memory CD4 T cells derived from thawed cells cultured overnight with cytokines were found to produce significantly more IFN-g, IL-2, and TNF in the lungs and draining lymph nodes (tLNs) of infected mice.

Conclusions-Implications: Cryopreserved IAV-specific memory CD4 T cells are efficient at mediating protection against lethal doses of virus. Overnight cytokine treatment (IL-7 and IL-2) and their combination is essential for optimal efficacy. Cryopreserved IAV-specific memory CD4 T cells are efficient at mediating protection against lethal doses of virus.
Effect of short and long sleep duration in predicting obesity among various racial groups of a large multi ethnic organization

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Keywords: Sleep Duration, Obesity, Racial Disparities

Introduction and Objectives: Background Literature shows strong association of normal sleep duration with obesity and increased CVD morbidity and mortality, but less is known about abnormal sleep duration. The purpose of this study is to predict relative risk of self-reported sleep duration with obesity across different racial groups.

Methods: Annual Health Risk Assessment is done yearly at Baptist Health South Florida for employees. According to CDC, we categorized self-reported sleep duration (hrs) as short (<7), reference (7 – 9) and long (>9), while obesity (BMI kg/m2) was categorized as class 1 (BMI=30-34.9), class 2 (BMI=35-40) and class 3 (BMI>40).

Results: Population consisted n=9701; 74% female; mean age 42.6 ±12 yrs; racial groups were 57% Hispanics, 16% Black,17% White, 5% Asian and 5% Non-Hispanic-other. In fully adjusted model, when compared to Hispanic group sleeping 7-9 hours, odds of obesity increased 46% (aOR=1.46, 95%CI 1.35-1.58); odds of class 1 obesity was higher among black sleeping <7 hrs; however, the odds of class 2 and class 3 obesity were significantly higher among Hispanic, White and Non-Hispanic-other. Hispanic-only students who reported being victims of cyberbullying and carrying a weapon and sleeping <7 hrs; however, the odds of class 2 and class 3 obesity were significantly higher among Hispanic, White and Non-Hispanic-other. Hispanic-only students who reported being victims of cyberbullying and carrying a weapon were at increased risk of obesity (OR=1.5, 95%CI 1.2-1.9, p=0.003); alcohol lifetime use (aOR=2.5, 95%CI 1.9-3.2, p<0.0001), and illicit drug use (aOR=2.5, 95%CI 1.7-2.4, p<0.0001).

Conclusions-Implications: Cyberbullying was not significantly associated with increased risk of weapon carrying in campus high school students. Weapon carrying was significantly associated with multiple interrelated factors including male gender, traditional bullying, poor academic performance, and behavioral and health issues. Decreasing rates of weapon carrying would be a viable strategy in order to decrease severity of violence in schools. Implications of this study for prevention indicate a need for comprehensive multidisciplinary services in high schools that include mental health counseling aimed at behavior change, as well as programs directed at decreasing adolescent substance abuse.

Conclusions-Implications: Our study demonstrates that sleep durations have varied effects on obesity among different races. Short or long sleep duration for one group may not be a better predictor of obesity in another racial group. Further studies are needed to revise the current sleep duration categories among various races.
**POSTER ABSTRACTS**

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**P27**

**Demographic variation in the frequency of glioma in Florida**


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**Keywords:** Glioma, Brain Cancer, Race, Florida, Demographics

**Introduction and Objectives:** Glial brain cancers affect nearly 20,000 individuals in the United States (U.S.) annually. Currently, SEER database data exploring the relationship between race and gliomas is available and has shown that cerebral gliomas have a higher frequency in Caucasian men. However, such analyses did not include demographic data specific to the state of Florida. This study assessed the association between race and glioma vs. non-glial Central Nervous System (CNS) cancers in Florida, U.S.

**Methods:** This case-control study utilized the Florida Cancer Data Registry (FCDR) in which race was considered the exposure and development of glioma as the measured outcome. The sample was comprised of patients in Florida diagnosed with brain tumors from 1988 to 2013. Relative frequencies were compared between patients with glial brain tumors and those with other CNS tumors in Florida. Data was analyzed using logistic regression analysis in order to determine any associations between race and frequency of diagnosis adjusting for several confounders (age, sex, smoking status, year of diagnosis, and insurance status).

**Results:** Between 1988 and 2013 a total of 14,092 patients meeting the inclusion and exclusion criteria were diagnosed in Florida with a primary brain tumor. Being of non-white race was associated with a 65% decreased odds of glioma diagnosis compared to the reference white population (adjusted OR 0.35, 95% CI 0.34-0.37). Secondary findings include associations between increasing age and male sex with increased odds of glioma diagnosis. Decreased adjusted odds of glioma diagnosis were found with former smoking status (reference non-smokers), diagnosis between 2001 and 2010 (reference 1981-1990), and Medicaid or Medicare insurance (reference private insurance). Hispanic ethnicity, current smoking status, no insurance/self-pay, and geographical location (urban vs. rural) all had no association with glioma diagnosis.

**Conclusions:** These findings are consistent with and help reinforce utilizing national databases (SEER) which also showed increased odds of glioma diagnosis in older white males. Various potential explanations for these findings include genetic predisposition, lifestyle and behavioral factors, and socioeconomic status, including access to healthcare. Future research aims at identifying potential genetic etiologies.

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**P28**

**Stroke outcomes in Florida pediatric and adult sickle cell patients: A retrospective, secondary analysis of the Florida hospital discharge database for stroke, 2008-2012**

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**Keywords:** Sickle Cell, Stroke, Risk Factors

**Introduction and Objectives:** Due to the high incidence of stroke in patients with sickle cell disease coupled with the severe, costly, and long-lasting effects, it is crucial to investigate this population. In Florida, there is minimally published data on stroke etiology and the impact on this population. The objective of this study was to provide a model look at the association between age and stroke outcome in a population of sickle cell disease patients.

**Methods:** A retrospective secondary analysis of the Florida Hospital Discharge Database for Stroke was conducted which included all patients (N=333,367) admitted to Florida hospitals with a primary diagnosis of stroke between January 1, 2008 and December 31, 2012. The exposure variable was age at admission which was dichotomized into two comparison groups: pediatric and adult. The dependent variable was stroke outcome. Variables of interest were mechanism of stroke, comorbidities and patient demographics.

**Results:** 210 hospitalizations for stroke in patients with sickle cell disease were identified. While the overall prevalence of adverse outcomes was 50%, the odds was significantly higher in the adult subgroup (OR=3.20, 95% CI[1.57,6.73]) compared to the pediatric subgroup. Additionally, the rate of adverse outcomes was significantly higher in patients with a hemoglobin stroke compared to an ischemic stroke (OR=2.70.95% CI[1.46-4.95]).

**Conclusions:** In a statewide patient population sample, the odds of having an adverse outcome in adult patients with sickle cell disease was significantly higher when compared to a pediatric subgroup. Clinicians should take into consideration a patient’s age to guide assessment, management and prognosis of stroke in the sickle cell disease population.

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**P29**

**MMP-13 as a therapeutic target in paclitaxel-induced neuropathy**

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**P30**

**Exosomal amyloid beta (Aβ) DNA sequence as a potential Alzheimer’s disease marker**

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**Keywords:** Alzheimer’s Disease, Exosomes, Amyloid Beta (Aβ), Diagnostic Biomarker, Human Neural Stem Cells (hNSC)

**Introduction and Objectives:** Alzheimer’s Disease (AD) is a neurodegenerative disease affecting more than 44 million people worldwide. Although recent advances have shed light on mechanisms and pathways responsible for its origin, development, and pathogenesis, we are still unsuccessful in finding an effective cure. Brain-imaging methods are used for the detection of AD, but it does not allow early detection of the disease and is ineffective in monitoring disease progression. Furthermore, amyloid plaques, a major hallmark of AD, resulting from the aggregation of amyloid beta (Aβ), is a consequence of abnormal processing of the amyloid precursor protein (APP). As exosomes, microvesicles of size 30-100nm, secreted by almost all types of cells are promising new biomarkers for the early detection and Aβ clearance, we aim to investigate the APP DNA sequence associated with exosomes to look for differential Aβ sequence.

**Methods:** Normal and AD ips-derived human neural stem cells (hNSC) were maintained in a human neural stem cell culture media. Exosomes were directly affected by paclitaxel, a chemotherapeutic drug with a rate-limiting toxic effect due to its effect on nerve axon degeneration. Due to the high incidence of stroke in patients with sickle cell disease, coupled with the severe, costly, and long-lasting effects and the impact on this population. The objective of this study was to provide a model look at the association between age and stroke outcome in a population of sickle cell disease patients.

**Results:** We've found the presence of Aβ sequence associated with exosomes in ips-derived human neural stem cells (hNSC) used as a control, but not with AD-hNSC. Our future goal is to analyze the Aβ sequence associated with exosomes that can be identified as a prognostic/diagnostic biomarker of AD.

**Conclusions:** As exosomes can cross the blood-brain barrier (BBB) and is abundantly in body fluids such as blood, urine, and serum, this study could provide a minimally-invasive biomarker to detect disease well before its clinical appearance.

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**P31**

**Postoperative complications as related to body mass index in total robotic hysterectomy: A retrospective study**

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**Keywords:** Hysterectomy, BMI, Complications, Total Abdominal Hysterectomy

**Introduction and Objectives:** With the increasing use of robotic hysterectomy and minimizing negative postoperative outcomes associated with this procedure. Considering the negative impact on patient well-being, knowing if there is an association between BMI and the risk of complications developing postoperative complications could help in preparing physicians to act earlier with this subset of patients. The objective of the study was to test for the association between BMI post-operative complications in women that underwent THI.

**Methods:** A retrospective cohort study using the Gynecological Research Group database using patients who had undergone THI between 2002-2016 in Miami Dade and Broward Counties, Florida. Study was to test for the association between BMI and the risk of complications.
Methods: A cross-sectional study was designed in which carriers and non-carriers of the BRCA1 mutation were recruited from the comprehensive breast cancer genetic counseling and education program (C3E) at the University of Miami. Our Risk of Cancer Empowered (FORCE) conference or through email. Participants qualified for the study if they were over the age of thirty, had intact fallopian tubes, ovaries, and uterus, were comfortable using a tampon and had no history of significant radiation or chemotherapy. They placed a vaginal tampon for 6 hours at home and returned the tampons to the laboratory through overnight mail. The tampon samples were de-identified, cells were isolated, and DNA was extracted. The DNA was interrogated for the presence of TP53 mutations in 12 exons using the MiSeq/NextSeq sequencer. Archer Analysis 6.0 pipeline was used for data analysis using three ovarian cancer cell lines with known mutations as positive controls and sensitivity controls.

Results: Sixty-six participants were enrolled. Thirty-two BRCA1+ and thirty-four control participants were included for analysis, with an average age of 37.7 and 37.0, respectively. TP53 mutations were not identified in any of the sixty-six samples.

Conclusions-Implications: There were no TP53 mutations detected in either population of clinically well women. Despite the limitations of our study, the use of tampons for sample collection was an effective and well accepted strategy for DNA collection in our population. Therefore future studies should continue to investigate vaginal tampons as a possible tool for the screening of Lynch syndromes.

P34 Vaginal microbial profile and socio-demographic characteristics of young African American women with asymptomatic bacterial vaginosis in the United States

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Keywords: Vaginal Vaginosis, Microbiome, Pregnancy

Introduction and Objectives: Approximately 50% of cases of bacterial vaginosis (BV) are asymptomatic and as such remain untreated. Untreated BV can progress and lead to damage of the epithelial integrity of the vaginal mucosa, increasing the risk of HIV infection. HIV positive women co-infected with BV experience increased viral shedding.

Methods: The vaginal swabs of 10 African American (AA) women were conducted on the vaginal swab and description of sociodemographic characteristics conducted using SPSS 23.

Results: The mean age of the sample was 21 years (range 18-25 years). The highest level of education attained in the sample was a master’s or advanced degree while the lowest was high school or less. Among the racial and ethnic minorities, African American women had been treated for BV in their lifetime and 61% had had prior pregnancies. In the past year 60% of the women had 2 or more different sexual partners and 40% of women had new sexual partners. The microbial taxa of the sample included species from the genus Anaerococcus (tetradus, prevotii, and lactycoccus), genus Prevotella (facklamii) and Peptostreptococcus stomatis and Prevotella amnii and Atoopobium vaginiae. Novel co-occurrence patterns were observed through network analysis, the most significant of which includes the species from the genus Anaerococcus and Actinomyces. Maximum variance was observed among Gardnerella vaginallis, however, this was not significant.

Conclusions-Implications: The use of whole genome sequencing to analyze the vaginal microbiome can aid in identifying potential biomarkers that may be associated with increased risk for HIV and increased viral shedding.

P35 The effect of race on survival in pulmonary squamous cell carcinoma in adults

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Keywords: Lung Cancer, Race, Squamous Cell Carcinoma

Introduction and Objectives: Lung Cancer is the leading cause of cancer death in men and women. Non-small cell lung cancer (NSCLC) accounts for 90% of lung cancers and squamous cell carcinoma comprises 25% of lung cancers. The objective of this study is to evaluate the association between race and survival in adults with pulmonary squamous cell carcinoma.

Methods: This is a secondary analysis based on the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) program on cancer statistics. The sample were adults older than 18 diagnosed with squamous cell carcinoma from 2007 onward. Survival over time was compared between Non-Hispanic Caucasian (NH-Caucasian), Non-Hispanic Black (NH-Black) and NH-Hispanic (NH-Hispanic). Kaplan-Meier curves were estimated for each study group and the log-rank test was used to compare survival distributions. Cox proportional hazard models were used to determine the independent effect race played in survival by estimating adjusted hazard ratios (HR) with 95% confidence intervals (95% CI).

Results: Our total sample was 18,112 adults. The adjusted multivariate analysis showed that race other than NH-Caucasian did not significantly affect survival outcome (NH-Caucasian: HR 0.94, 95% CI 0.88-1.02; NH-Black: HR 0.95, 95% CI 0.90-1.01; NH-Hispanic: HR 1.07, 95% CI 0.98-1.16). Mutations in 10 other variables that independently affected survival were gender (male: HR 1.12, 95% CI 1.08-1.16, p<0.001), age at diagnosis (age 60-79: HR 1.19, 95% CI 1.19-1.23, p<0.001; age ≥80: HR 1.48, 95% CI 1.38-1.57, p<0.001), stage at diagnosis, and performance status, obesity, smoking status and histology.
POSTER ABSTRACTS

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**P36**

**Pancreatic intraepithelial neoplasia (PanIN) as a morphologic marker of pancreaticobiliary type of ampullary carcinoma**

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Keywords: PanIN, Ampullary Adenocarcinoma, Intestinal Subtype, Pancreatobiliary Subtype

**Introduction and Objectives:** In 1994, Kimura reported two main types of ampullary adenocarcinomas, the intestinal and the pancreaticobiliary (PB). This classification was later found to be important in predicting the prognosis as well as determining the therapeutic strategy. Histologically, the intestinal subtype is characterized by villous architecture and is considered to be a well-recognized precursor to pancreatic adenocarcinoma. Three studies have shown concurrent PanIN in patients with ampullary carcinoma, but the association between the two subtypes has not yet been reported. Reports of similar molecular alterations in pancreatic adenocarcinoma and PB type of ampullary carcinoma hint at a common carcinogenic pathway. The purpose of this study was to evaluate the association of PanIN with the two major ampullary adenocarcinoma subtypes.

**Methods:** Fourteen cases of segmental resection for ampullary adenocarcinoma were retrieved from our archives. The cases were classified into two groups based on the presence or absence of PanIN. All the cases were stained for CK7, CK20 and CDX2 and were classified as intestinal or PB type based on the staining pattern.

**Results:** All 10 cases with PanIN stained negative for CDX2 and were classified as PB type (p=0.01). Of the cases without PanIN, 3 were classified as intestinal subtype based on CDX2 positivity and 1 was classified as PB type. Concurrent PanIN was present in 91% of PB type of ampullary adenocarcinoma. The grade of PanIN did not influence the grade or stage of the adenocarcinoma.

**Conclusions-Implications:** The histologic subtyping of ampullary adenocarcinoma appears to have significant prognostic and therapeutic implications. But due to the considerable variability in isolated morphology based subtyping, higher frequency of poorly differentiated cancers and low incidence of disease, the histomorphologic classification of ampullary adenocarcinomas remains one of the grey zones in surgical pathology. In this scenario, our study helps to establish the strong differentiator between the two subtypes. This is supported by the establishment of PanIN as a definite precursor of pancreatic adenocarcinoma and the identical molecular landscape of pancreatic adenocarcinoma and PB type ampullary adenocarcinoma.

**P37**

**Predictive outcomes of ultrasound guided biceps tendon sheath corticosteroid injection**

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Keywords: Ultrasound, Corticosteroid Injection, Tendonopathy, Biceps

**Introduction and Objectives:** It is important to determine factors predictive of therapeutic success following ultrasound guided sheath injection. Introduction: Various structures are involved in the shoulder joint anatomy including the muscles of the rotator cuff, glenoid labrum, long head of the biceps brachii (LHB) tendon, various ligaments, osseous structures, cartilage and bursae. External factors such as potential sources of injury, and the repetitive nature of the activity are known to play a role as well. There have been several concurrently injured structures that may contribute to symptoms. Although studies have demonstrated the efficacy of both NSAsIDs and intra-articular corticosteroid injection, there are recorded studies aimed at determining factors that predict the long term efficacy of non-surgical management, especially related to direct corticosteroid injection into the LHB sheath. This is the first documented study specifically aimed at determining factors predicting the likelihood of treatment success or failure with direct long head of the biceps tendon sheath corticosteroid injection in patient’s presenting with clinical evidence of biceps related pain.

**Methods:** 162 cases divided into three groups based on clinical responses: complete, partial or no relief. These patients were referred for injection on the basis of clinical signs and symptoms suggestive of biceps tendinitis as determined by three orthopaedic surgeons. Differences in age and sex among subjects from the four response groups were compared using ANOVA and Fisher’s exact test. Ordered logistic regression for treatment response was carried out using those variables which were significantly different between subject groups in univariate analyses. Differences were considered significant at p<0.05. The statistical analysis was performed using Stata 11.1.

**Results:** Of the 115 injections with follow up, 19.1% reported no clinical response while 53.0% had a complete response and those with fibromyalgia or chronic spine pain were strongly associated with a poor outcome (OR = 5.7, p < 0.001).

**Conclusions-Implications:** The data in our study supports LHB tendon sheath injection as a reasonable alternative in the nonsurgical treatment of LHB tendon pathology, even in patients with known rotator cuff or bursal pathology, as well as articular changes. Simultaneous IA/ID bursa injection should be considered in patients who undergo USG if there is clinical and/or sonographic suspicion of concomitant bursitis or clinical evidence of subacromial impingement. We propose a treatment algorithm beginning with USG of the LHB tendon sheath injection in all patients without “pain syndrome” presenting with acute LHB tendinopathy before proceeding to surgery. Not only did most patients have good relief or partial relief outcomes, but USG is less invasive, has fewer associated complications and results in less overall cost compared to surgery. Ultrasound guided intraosseous injection is an effective method of non-surgical management for biceps tendinopathy.

**P38**

**An unusual case of lung mass. Neoplasm? Pulmonary sequestration!**

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Keywords: Neoplasms, Lung, Sequestration, Mass, Vessel

**Introduction and Objectives:** Pulmonary sequestration is characterized by lung tissue supplied by an anomalous artery usually from the systemic circulation without communication with the tracheobronchial tree. They are classified as ILS (contain within the visceral pleura) and ELS (separate from surround parenchyma by its own pleural investment). Symptoms vary and are usually nonspecific including cough, fever, recurrent infection and hemoptysis especially in ILS. Imaging studies sometime can be misleading as they may manifest as masses or cystic/cauliflower lesions. We presented a case of intralobar sequestration in a 69 y/o asymptomatic women with an incidental consolidation/mass in the right lower lobe with the presumed diagnosis of a neoplastic process.

**Case Presentation:** A 69-year-old woman presented with a history of an incidental right lower lobe consolidation found during a cardiac CT-Scan. Follow-up CT showed development of a new nodular component (1.8 cm), which caused suspicion for a neoplastic process. Biopsy performed showed no evidence of tumor or granulomas. The PET-scans on follow-up showed enlargement and increased uptake of the lesion. Surgery was then performed and the lesion underwent a robotic video-assisted thoracoscopic during which an abnormal vessel coming directly off the aorta and supplying the mass was identified. The finding was consistent with a pulmonary sequestration.

**Conclusions-Implications:** Pulmonary sequestration is a very rare anomaly characterized by the occurrence of lung tissue that does not communicate with the tracheobronchial tree, and has a systemic, instead of a pulmonary, arterial supply. It is subdivided into two variants, intralobar sequestration (ILS) and extra-lobar sequestration (ELS), depending on its relationship to the visceral pleura. This entity can mimic a neoplasm. Therefore it is important to accurately differentiate from other lung lesions that will require more aggressive treatment.

**P39**

**Massive lipomatosis of the small intestine causing intussusception**

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Keywords: Lipomatosis, Intussusception, Lipoma

**Introduction and Objectives:** Intestinal lipomatosis is a disease of unknown etiology which may present with a number of stigmata, like abdominal pain, subacute intermittent obstruction, and hamartomatous syndromes. Only 14 documented cases of diffuse intestinal lipomatosis exist and only 2 documented cases predicting the disease were made by liposarcoma. Most patients in reported cases of intestinal lipomatosis were asymptomatic, however some presented with sub-acute intermittent obstruction, colonic perforation, and intussusception. The exact etiology of complications is unknown. Early diagnosis of adult intussusception is difficult because most

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Trends in developmental delays among children with ADHD: a comparison of no treatment and two intervention strategies


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Keywords: Attention Deficit Hyperactivity disorder (ADHD), Treatment Modality, Social Functioning, Pharmacotherapy, Cognitive Behavioral Therapy (CBT)

Introduction and Objectives: Attention deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral pediatric disorder, affecting 3-7% of school age children. ADHD in the developmental period of age 7 to 17 years is associated with poor socioeconomic outcomes and decreased quality and number of dyadic relationships. This study aims to determine whether pharmacotherapy, cognitive behavioral therapy (CBT), or a combination of both, is associated with improved social function in children with ADHD compared to controls receiving either pharmacotherapy or CBT.

Methods: This is a secondary analysis using information from the 2009–2010 National Survey of Children with Special Healthcare Needs (NSCH). Children whose parent reported clinical manifestations of ADHD and were receiving ADHD treatment were included. The independent variable is treatment modality - pharmacotherapy only, CBT only, or a combination of both. The dependent variables are social functioning, defined as making/maintaining friendship, aggression/acting-out, participation in activities, and participation in play. The associations between treatment modality and social functioning and covariates were explored through a bivariate analysis. Adjusted odds ratios with 95% confidence intervals while controlling for confounders were obtained using logistic regression.

Results: 7,775 children were included in this study, with 54.2% receiving only pharmacotherapy, 25.9% receiving only CBT, 9.4% receiving both, 6.9% receiving only behavioral therapy, and 7% receiving no therapy. Only gender and parental education level were associated with treatment modality at baseline. After unadjusted analyses there was no difference in social functioning between children with ADHD who were treated with combined pharmacotherapy and CBT compared with those receiving only pharmacotherapy (OR 0.8, 95% CI 0.6-1.1, p=0.342) disappeared.

Conclusions-implications: Our study has built on previous studies as well as identified novel risk factors associated with ADHD, such as income, race, black mothers, women with lower levels of education, and women with relational stressors. Preventative efforts could be focused on development of interventions targeted towards risk populations.

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Treatment modality and social functioning in children with attention deficit hyperactivity disorder


Herbert Wertheim College of Medicine, Florida International University, Miami, FL

Keywords: Attention Deficit Hyperactivity disorder (ADHD), Treatment Modality, Social Functioning, Pharmacotherapy, Cognitive Behavioral Therapy (CBT)

Introduction and Objectives: Attention deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral pediatric disorder, affecting 3-7% of school age children. ADHD in the developmental period of age 7 to 17 years is associated with poor socioeconomic outcomes and decreased quality and number of dyadic relationships. This study aims to determine whether pharmacotherapy, cognitive behavioral therapy (CBT), or a combination of both, is associated with improved social function in children with ADHD compared to controls receiving either pharmacotherapy or CBT.

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Conclusions-implications: Our study has built on previous studies as well as identified novel risk factors associated with ADHD, such as income, race, black mothers, women with lower levels of education, and women with relational stressors. Preventative efforts could be focused on development of interventions targeted towards risk populations.
Level of parental education and physical activity in the pediatric epileptic population

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Keywords: Epilepsy, Exercise, Parents, Education, Children

Introduction and Objectives: Epilepsy in the pediatric population has a noticeable impact on the quality of life of the afflicted. Physical activity positively benefits epileptic children; however, epileptic children are less likely to participate in physical activity than their counterparts, potentially further decreasing the quality of life of these children. Objective: To assess whether the level of parental education is associated with participation in physical activity of epileptic children living in the US.

Methods: We performed secondary analysis of data collected by the National Survey of Children’s Health in 2012 and 2016. Children aged 6-17 years with a previous diagnosis of epilepsy were included. The independent variable was the highest level of parental education (categorized as “up to high school” and “above high school”). The dependent variable was adequate physical activity, defined present if the child participated in exercise, played sport, or performed any physical activity for 60 minutes for at least 4 days a week. Any level of activity done less than 4 days a week was considered not adequate. Independent associations were assessed using multivariate logistic regression models. P-values ≤0.05 were considered statistically significant (two sided test).

Results: We studied 310 epileptic children. Of those, only 43% exercised adequately. About 20% of the parents had an educational level up to high school. The level of parental education was not associated with adequate physical activity in the pediatric epileptic population (the unadjusted odds ratio for parents with up to high school education level to exercise adequately was OR=0.8, 95% CI 0.3-2.5; and the corresponding adjusted OR=0.6, 95% CI 0.3-2.7, after adjusting OR=0.6, 95% CI 0.3-2.6; accounting for epidiolepsy, parent physical activity levels and mental health status, and child’s race, sex, and age).

Conclusions-Implications: More than half of children with epilepsy perform inadequate amounts of exercise. Physicians at medical institutions could educate parents of children with epilepsy about the benefits of and barriers to exercise for their children to increase child participation in physical activity. In this sample of epileptic children, we found no evidence for association between the level of parental education and adequacy of physical activity.

Risk factors associated with decreased condom use in adolescents

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Keywords: Adolescents, Condom-Use, Risk Factors

Introduction and Objectives: The CDC reported an increase in STD prevalence and, coincidently, a concurrent decrease in condom use during sexual intercourse in adolescents. By understanding the determinants that are associated with reduced condom use in high school students, a more directed approach to community funding and interventions can be pursued.

Methods: We used the 2017 YRBS national database, a survey national administered since 1990 to assess health behaviors amongst high school students in the United States. Our cross-sectional sample included students in grades 9-12 and excluded subjects who have never been sexually active. The dependent variable was condom use during sexual intercourse and our independent variables were factors: females (aOR 0.8, 95% CI 0.6-1.0), White (aOR 0.5, 95% CI 0.3-0.8), younger age (aOR=0.7, 95% CI 0.6-0.8), higher parental education (aOR=0.5, 95% CI 0.4-0.7), and having a sexual partner (aOR=0.4, 95% CI 0.3-0.5). The covariate adjusted odds ratios (aOR) and 95% confidence intervals (95% CI) for the associations between potential predictors and condom use were calculated.

Results: Our analytical sample included 2,575 students. Analysis of the data considered showed a significant (OR 0.91; 95% CI 0.68-1.22 and OR 0.83; 95% CI 0.68-1.02) decrease of the association between sexual activity and condom use. The total number of participants in this study was 40,422. Results: The adjusted odds decreased a 35% decrease in odds of ADHD among parents in the lowest poverty level of <100% compared to the highest poverty level of >400%. OR 0.65; 95% CI 0.48-0.82). The adjusted odds ratios for the other poverty levels (100-199% and 200-399%) and ADHD were not statistically significant OR 0.91; 95% CI 0.68-1.22 and OR 0.83; 95% CI 0.68-1.02, respectively) when compared with the lowest poverty level. Conclusions-Implications: Although most studies showed an increased likelihood of ADHD among lower socioeconomic demographics, we observed a decreased likelihood among children living in a household with an annual income of <100% below the federal poverty level. Future studies may consider methodology to better elucidate underlying mechanisms and the directionality of the named associations.

An observational study: Environmental and other factors for pediatric depression

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Keywords: Depression, Neighborhood, Environment, Pediatric

Introduction and Objectives: Poor environmental characteristics have been associated with poor mental health, but research directed at pediatric mental illness in disadvantaged social conditions remains an area of further exploration. With suicide climbing as the second leading cause of death among children, it is imperative that we better understand the causes of pediatric depression. The goal of this study is to understand the association between environmental conditions on depression in pediatric populations. Specifically we aim to assess the association between unfavorable environmental physical characteristics and depression in pediatric populations in the US.

Methods: We used a nationally representative sample (N= 82,197) from the National Survey of Children’s Health from 2011/2012 focusing on children ages of 2-17 years to assess the association between neighborhood amenities and depression. We controlled descriptive analysis of sociodemographic characteristics and neighborhood characteristics, as well as unadjusted and adjusted multivariate logistic regression analysis.

Results: Decreased amenities had higher odds of childhood depression in the unadjusted analysis; after controlling for confounders there was no longer statistical significance. Secondary factors that were statistically significant for higher odds of childhood depression in our adjusted analysis included: children 8-17 years (p< 0.00); child’s overall health reported as less than excellent had a greater odds of depression (t-test; AOR = 1.23, 95% CI 1.17-1.29); and poor health, AOR = 1.23, 95% CI 1.49-1.30); household income below poverty level (AOR = 2, 86%, 95% CI 1.3-2.0); and at 301-400% of FPL (AOR = 1.5, 95% CI 1.1-2.2); and lastly, one parents with poor mental health had a greater odds of childhood depression in two parents with poor mental health (AOR=3.7, 95% CI 2.6-5.3; AOR = 2.4, 95% CI 1.4-4.1 respectively). Protective factors include black race (AOR = 0.8, 95% CI 0.6-0.9); maternal education at or below high school (AOR = 0.7, 95% CI 0.5-1; AOR = 0.5, 95% CI 0.3-0.9 respectively); and second generation households (AOR = 0.3, 95% CI 0.2-0.5).

Conclusions-Implications: These findings indicate the need for further exploration of the role of environmental factors in pediatric depression. Better understanding of associations and potential risk factors for pediatric depression may offer insight in guiding counselling interventions, inform future policy, and may facilitate prevention programs aimed at neighborhood and housing improvement.

Association between poverty and the prevalence of ADHD in children aged 4-17

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Keywords: Mental Health, Socioeconomic Status, Children, ADHD, Poverty

Introduction and Objectives: Attention-deficit/hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood and with symptoms and/or impairment often continuing into adulthood. This study will examine trends in parent-reported ADHD by household annual income during 2016, which is valuable given the increasing prevalence of ADHD in the United States. The objective is to assess the association between poverty level experienced in the household and the prevalence in 2016 of reported ADHD diagnoses among children in the United States aged 4-17.

Methods: This cross-sectional study uses data from the National Survey of Children’s Health, which collects data from parents about the health and functional status of their children across the US via a random telephone survey. The independent variable was poverty status of the household, collected as annual household income according to federal poverty level: <100%, 100-199%, 200-399%, and >400%. The outcome variable was ever having a reported diagnosis of ADHD. The covariates included among others, were age, sex, race, ethnicity, health insurance type. Unadjusted and adjusted logistic regression models were used to study the association between a household’s poverty level and reported ADHD diagnosis. Odds ratios (OR) and 95% confidence intervals (CI) were calculated.

Results: The total number of participants in this study was 40,422. The adjusted results demonstrated a 35% decrease in odds of ADHD among parents in the lowest poverty level of <100% compared to the highest poverty level of >400% (OR 0.85; 95% CI 0.48-0.82). The adjusted odds ratios for the other poverty levels (100-199% and 200-399%) and ADHD were not statistically significant (OR 0.91; 95% CI 0.68-1.22 and OR 0.83; 95% CI 0.68-1.02, respectively) when compared with the lowest poverty level. Conclusions-Implications: Although most studies showed an increased likelihood of ADHD among lower socioeconomic demographics, we observed a decreased likelihood among children living in a household with an annual income of <100% below the federal poverty level. Future studies may consider methodology to better elucidate underlying mechanisms and the directionality of the named associations.
The relationship between social support and psychological distress in Latina mothers living in Miami-Dade County

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Keywords: Social Support, Psychological Stress, Acculturation, Latina, Mental Health

Introduction and Objectives: Previous studies have demonstrated a link between social support and mental health. However, few studies have explored this relationship among adult Latina women. This study aimed to examine the association between social support and psychological distress in Latina women living in Miami-Dade County. In addition, acculturation was examined as a potentially modifying factor.

Methods: The study included baseline data of 155 Latina mothers in Miami-Dade County collected as part of a longitudinal study of Latina mother and daughter dyads in the year 2005. Social support was measured using the Interpersonal Support Evaluation List (ISEL)—score ranging from 0 to 80, and categorized into tertiles: low (<60), medium (62-72), high (>73). Psychological distress was assessed based on participants self-report of occurrence of depression, anxiety, or suicidal ideation. Acculturation was measured by an English proficiency composite score (ranging from 3-12), interview language, and length of residence in the U.S.

Results: Results of multivariate logistic regression models showed that compared to women with a high level of social support, women with low social support had higher odds of reporting psychological distress (Odds Ratio = 7.8; 95% Confidence Interval = 2.74-22.14). Level of acculturation, however, did not modify the association between social support and psychological distress (P = 0.74).

Conclusions-Implications: College students are at risk for PIU. PIU is associated with negative sleep and mental health outcomes. College administrators should investigate ways to publicize services and prompt students to decrease their internet use. Colleges can offer counseling in a tech-free environment through internet “fasting camp” and “sleep tip” programs and organize support groups to help decrease dependence on online social connections.

Pathological internet use, also known as excessive internet use (PIU) is excessive internet use that interferes with one’s daily life. PIU has been linked to insomnia, mental health issues, and negative academic performance. This pilot study aimed to measure the degree to which such an association existed among a student population at a large Hispanic-serving research university in south Florida. The purpose of this research was to investigate the phenomena of increased internet usage and its impacts on college students’ sleep habits, mental health, and overall academic performance.

Methods: A cross-sectional study design employing venue-based sampling was used to recruit students from seven high traffic locations on campus. To be eligible students had to be at least 18 years of age and currently enrolled at least one three-credit hour course. Students were selected opportunistically. By assessing PIU, insomnia severity, psychological distress, student center services usage, academic performance, and top reasons for internet use. Cross tabulations and bivariate correlations were run to find significant associations among variables and a multiple linear regression was run to identify explanatory variables of PIU.

Results: Data were collected from 405 students from November 2018 to January 2019. More than half of respondents (58%) had indicators of PIU. Of those, 30% scored positive for depression, 33% for moderate and severe psychological distress, and 29% for moderate and severe insomnia. Bivariate correlations were significant between PIU and all of those variables (p<0.01). PIU was highly associated with insomnia severity and selecting “dating” and “reading news” as top reasons for internet use. Most students (79%) knew about wellness and health services on campus but 51% never utilized them.

Conclusions-Implications: College students are at risk for PIU. PIU is associated with negative sleep and mental health outcomes. College administrators should investigate ways to publicize services and prompt students to decrease their internet use. Colleges can offer counseling in a tech-free environment through internet “fasting camp” and “sleep tip” programs and organize support groups to help decrease dependence on online social connections.

Describing the relationship between sexual orientation and sexual contacts among US adolescents

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Keywords: Sexual Health, Adolescents, LGBTQA, Sexual Minorities

Introduction and Objectives: Of late, sexual activity during adolescence is increasingly considered a normative behavior. Nearly half (47%) of all high school students in the United States have ever had sex and more than one-third (34%) are sexually active currently. However, higher rates of negative sexual health outcomes have been reported. Given the significant youth population of this country, we sought to better understand the relationship between sexual identity and current sexual practices. Namely, whether or not this group has a higher prevalence of sexual activity and risky sexual behaviors.

Methods: Data were collected from the 2015 Youth Risk Behavior Surveillance Survey (YRBSS). From this dataset, we identified a sub-group of participants who identified as sexual minorities. Of note, sexual orientation was assessed based on participants self-report of occurrence of depression, anxiety, or suicidal ideation. Acculturation was measured by an English proficiency composite score (ranging from 3-12), interview language, and length of residence in the U.S.

Results: Sexual minorities were significantly more likely than non-minorities to have ever had sex, sexual minorities were also more likely to be sexually active currently. However, sexual minorities were more likely than non-minorities to report using a condom at last sexual intercourse. Persons who identified as bisexual were an exception, as this sub-group was less likely to report using a condom at last sexual intercourse than both heterosexual and non-minorities. The prevalence of abstinence declined by grade group across the data, but more so among those who identified as heterosexual. Interestingly, boys were significantly more likely than girls to identify as gay or lesbian. Also, there was no significant difference between identifying as bisexual. Finally, sexual minorities were more likely than non-minorities to have ever had an HIV test.

Conclusions-Implications: There seems to be marked behavioral differences between sexual minority and non-minority youth in the US. These differences may have various implications for sexual health and prevention initiatives designed for sexual minorities and non-minorities. Our findings suggest that, although they may engage in sexual activity at an earlier age and more frequently, sexual minorities may be better informed and/or have a heightened awareness of sexual risk than their non-minority counterparts. This knowledge can be used to target prevention strategies aimed at this group as their prevention education needs may differ from their heterosexual peers. We encourage investigators to consider future research aimed at understanding the implications of behavioral differences between sexual minority and non-minority youth, particularly in the realm of health disparities.

Two cases of post colonoscopy appendicitis: Case study

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Keywords: Colonoscopy, Appendicitis, Colonoscopy Complications, Abdominal Pain

Introduction and Objectives: Colonoscopy is a gold standard procedure utilized to examine the large intestine or rectum with a flexible fiber-optic scope. This procedure is commonly performed for diagnostic purposes and also commonly used for diagnostic purposes to investigate varying degrees of lower gastrointestinal symptoms. According to cdc.gov approximately 15 million Americans underwent screening colonoscopies in 2012. The United States Health System targets to screen about 80% of adults for colorectal cancer during ages of 50 to 75 by 2024. Some of the complications following colonoscopy examination are well documented and include cardiopulmonary complications related to use of sedatives, bleeding which is usually associated with polypectomy, perforation of bowel, and infection. However, other complications like acute appendicitis following colonoscopy have been less studied and are rarely reported.

Case Presentation: First patient: 53 year old white male presented to ED in the evening with complaint of gradual onset, moderate to severe, right lower quadrant abdominal pain and associated with nausea, non-bloody vomiting, and diziness. Patient underwent a screening colonoscopy that same morning without any obvious complications and started having abdominal symptoms after he started eating later that day. Abdomen CT showed multiple appendicoliths present within lumen of 1.1 cm dilated appendix and 7-19 mm, multiple additional appendicoliths. Patient underwent a laparoscopic appendectomy under general anesthesia without complications. Second patient: 55 year old Hispanic male with less than one week history of screening colonoscopy. Patient presented with one day history of acute severe abdominal pain, located in periumbilical and right lower quadrant, sharp, moderate to severe in intensity. Patient had guarding without fever, and nausea without vomiting. Patient reported having a screening colonoscopy within a week as a part of any complications with normal findings. Abdomen CT showed appendix presents about 12 mm in caliber with a distended lumen and perirectal inflammatory changes consistent with acute appendicitis. Patient underwent emergent laparoscopic appendectomy under general anesthesia without complications.

Conclusions-Implications: Colonoscopy is a relatively new procedure that can be associated with rare life threatening complications such as appendicitis presented in these two cases. The pathophysiology of post-colonoscopy appendicitis is not completely understood, however, possible mechanisms include barotrauma from over-insufflation, direct injury to appendicular lumen leading to local edema, penetration of stool and debris inside appendiceal lumen and also the potential of preexisting subclinical disease of appendix. Timely diagnosis of life threatening complications of colonoscopy is crucial and any gastrointestinal symptomatology during post colonoscopy period should be immediately investigated. Patients should be encouraged to seek immediate medical advice if experiencing such symptoms after a colonoscopy procedure.
Evaluation of race as an effect modifier of the association between diabetes and surgical site infection


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**Keywords:** Hysterectomy, Infection, Diabetes, Race

**Introduction and Objectives:** Diabetes is a chronic condition that currently affects almost 10% of the adult population in the US. They are at increased risk of surgical site infection (SSI) compared to those without diabetes. Few studies evaluate the role of race in the association between diabetes and SSI. Our objective was to investigate race as an effect modifier of the association between diabetes and SSI in patients undergoing total abdominal hysterectomy (TAH).

**Methods:** We nested a historical cohort into the 2016 American College of Surgeons National Surgical Quality Improvement Program database (NSQIP). Exploratory analyses included description of baseline characteristics and bivariate analyses to identify potential confounders. To adjust for confounders and test for interaction, multivariable logistic regression models were fitted: a general model including the interaction between race and diabetes, and separate models for each race.

**Results:** Of the 16,043 included women, 63% were Caucasian and 29% African Americans. Eleven percent were diagnosed with diabetes and the incidence of surgical site infection was 3.8%. After adjusting for age, race, functional status, dyspnea, COPD, hypertension, disseminated cancer, bleeding disorder, and operation time, the odds ratio (OR) of SSI between diabetics and non-diabetics was 1.62 (95%CI:1.29-2.02), and the interaction between race and diabetes was not statistically significant (p=0.540). After stratification, the adjusted ORs of infection between diabetics and non-diabetics were very similar between whites and blacks (1.55; 95%CI:1.18-2.05 and 1.62; 95%CI:1.07-2.45, respectively).

**Conclusions-Implications:** Our data supports that diabetes increases the risk for SSI after TAH. Obesity, hypertension, dyspnea, and operation time (>2hours) independently increase the odds of developing SSI. Lastly, we didn’t find evidence supporting the role of race as an effect modifier of the association between diabetes and SSI in those undergoing TAH.

Moving away from mannitol infusion for partial nephrectomy: has there been any effect on renal function?


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**Keywords:** Urology, Partial Nephrectomy, Mannitol, Renal Function, GFR

**Introduction and Objectives:** Currently, partial nephrectomy is the recommended treatment for localized renal cancer, according to the AUA guidelines. However, one of the major concerns in the setting of partial nephrectomies is the effect of ischemia on the remaining kidney parenchyma. It is understood that ischemia is a significant modifiable factor influencing nephron damage and renal failure due to the effect of organ-induced ischemia and subsequent ischemia reperfusion injury. In response, diuretics such as mannitol have been used in the hopes of mitigating these phenomena. Although mannitol has been used for many years for its purported protective effects, recently multiple studies of mannitol use specifically in the setting of partial nephrectomy have emerged challenging this assertion. This study considers whether mannitol administration has shown any benefit to patients in the contemporary era.

**Methods:** We retrospectively reviewed a multi-institution database for an association between mannitol administration and subsequent renal function during follow-up. These patients were assessed for de novo chronic kidney disease, stage III (CKD III) and followed with estimated glomerular filtration rate (eGFR). Statistical analysis included Mann-Whitney-U and chi-squared tests for comparing baseline and perioperative variables, and postoperative outcomes. eGFR changes were evaluated with a mixed-effects linear regression model.

**Results:** Between 2014 and 2017, 915 patients were identified whose operative reports or surgeons’ treatment algorithms explicitly described mannitol administration. 667 (73%) of patients did not receive mannitol. They did not differ significantly at baseline in terms of demographics, age, Charlson comorbidity index, nephrometry score, tumor size, grading, or baseline eGFR from those who received mannitol. On follow-up, patients were tracked for a median of 5 months (IQR 0.4-18 months), during which mannitol use was associated with an increase in de novo CKD III (14% v. 9%, p < 0.001), and minimally worsened median eGFR on final follow-up (73 v. 76, p < 0.05) (table). On multivariate analysis, mannitol was not associated with changes in renal function, which appeared to be most strongly related to ischemia time and length of follow-up. Interestingly, ischemia time and operative time appeared slightly longer with mannitol use.

**Conclusions-Implications:** Mannitol administration, long believed to prevent ischemic damage during partial nephrectomy, has recently been phased out. Our analysis of partial nephrectomy patients during this shift in practice patterns indicates that mannitol administration likely confers no short- or long-term renal benefit. Mannitol may be used at the surgeon’s discretion, but if it prolongs surgery time or ischemia time, it may actually be detrimental to outcome.