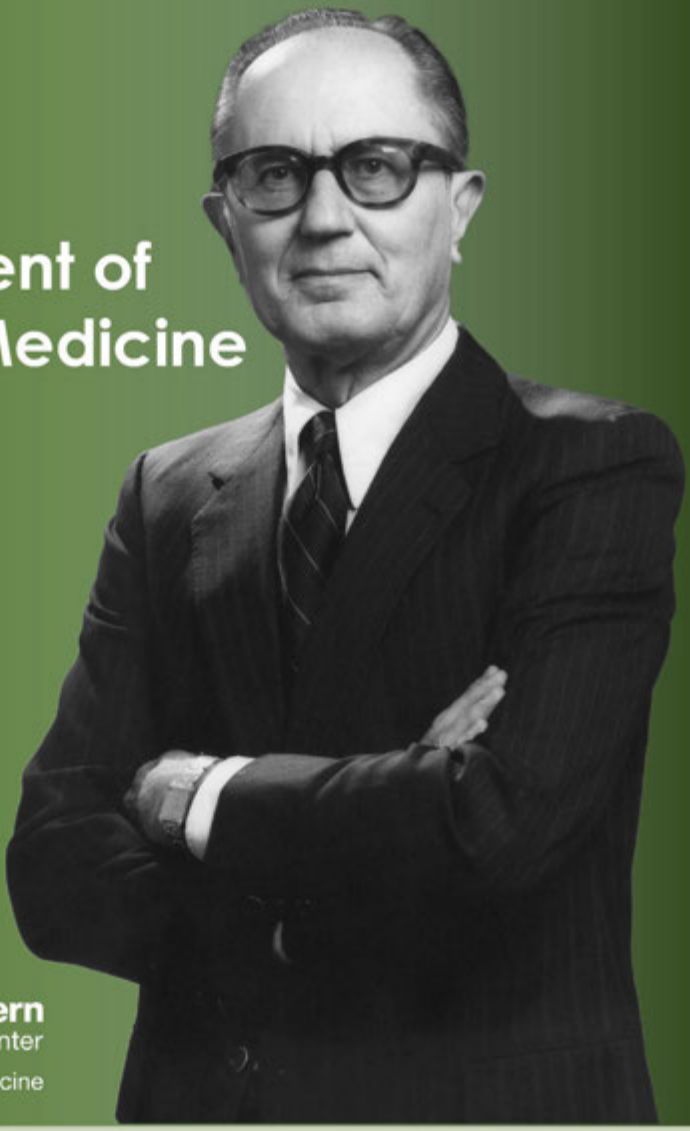
The
Department of Internal Medicine
Presents



UT Southwestern
Medical Center
Department of Internal Medicine

The 4th Annual

Donald W. Seldin, M.D. Research Symposium

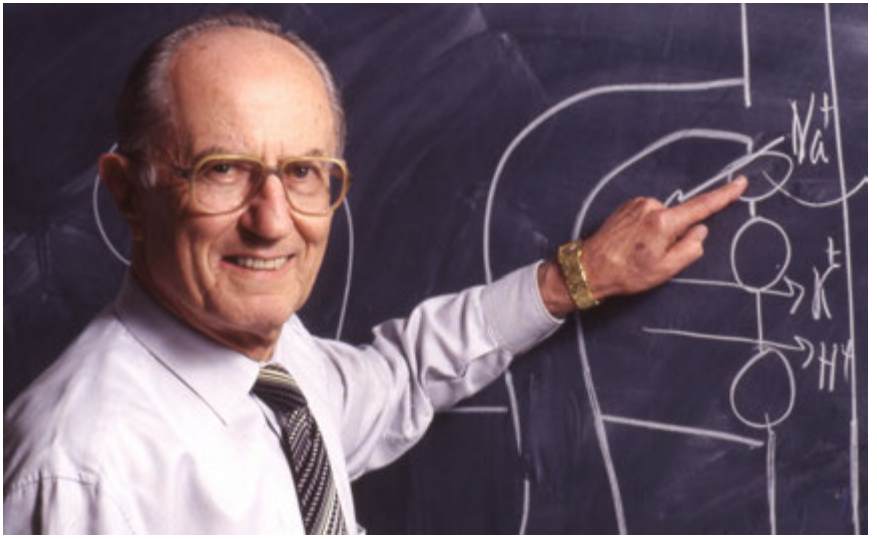
May 9-10, 2019

In loving memory of Donald W. Seldin
1920-2018

A Message from the Chairman

David Johnson, M.D., MACP
Donald W. Seldin Distinguished Chair in Internal Medicine

The Donald W. Seldin Research Symposium was established in 2016 to celebrate and publicize the creativity of our remarkable trainees. The symposium was the brainchild of the chief residents who sought to create a convivial venue in which their colleagues could showcase and share their research activities with one another. It was a brilliant idea and one that Dr. Seldin applauded. This year, the residents will be presenting over 100 posters that span the entire range of research, from case reports to clinical research, from quality improvement to fundamental pathobiology. This remarkable breadth of research is made possible in part by the fantastic clinical venues in which we work and the tireless mentorship and dedication of a faculty deeply committed to fostering scholarly activities. Together, in partnership with Internal Medicine and UTSW faculty, our trainees have access to one of the most uniquely broad and varied opportunities for research in all fields and interests. Looking forward, the Seldin Research Symposium will continue to serve as our springboard for new initiatives to increase resident interest and participation in research, foster new collaborations between our faculty and trainees to contribute towards our fund of knowledge, and train our residents and fellows for the future of medicine, today.



"An institution is The Lengthened Shadow of One Man."

- *Ralph Waldo Emerson*

The biomedical research pedigree of UT Southwestern Medical Center is as storied and accomplished as that of other prominent institutions more than twice our age. Those who lead UT Southwestern today can point to one figure who, more than anyone else, was the singular guiding force and architect of one of the preeminent academic medical institutions in the United States: Dr. Donald W. Seldin.

The beginning of Dr. Seldin's tenure at UT Southwestern is a tale that has been told endlessly throughout the years, but bears repeating. In 1951, Dr. Seldin arrived in Dallas from Yale to find a set of military barracks and a brick building in disrepair: the entire campus of UT Southwestern. By the middle of 1951, Dr. Seldin was the sole remaining full-time faculty member at UT Southwestern, and thus Chair of the Department of Medicine by default. Through community engagement and collaboration with local physicians, Dr. Seldin built the Department of Medicine upon the foundation that still underpins the strength of UT Southwestern today: its trainees. By personally selecting the most promising talent, sending them across the country to study with the best scientific minds of their time with the promise to return, Dr. Seldin's faculty tree blooms with staggering distinction and accomplishment. Daniel Foster. Michael Brown. Jean Wilson. Floyd Rector. Norm Kaplan. His personal encouragement of Joseph Goldstein to study genetics instead of neurosurgery, and his suggestion of partnership with Michael Brown, culminated in their Nobel Prize in Physiology or Medicine.

Throughout his 37-year tenure as Chair, Dr. Seldin never wavered in his advocacy that anchored the Department to the mission of the clinical scholar – advancing a fundamental understanding of human health, disease and its treatment via research. During the evolution of academic medicine and its increasing clinical demands, Dr. Seldin's leadership ensured that research flourished as a key emphasis in the tripartite academic mission. He emphasized the definition of a medicine faculty as clinicians who pursued innovation, discovery of new knowledge and its transmission to others. He emphasized the intertwined relationship between research and clinical medicine, noting that "the critical observation and analysis of disease contributes both to good medical care and new knowledge."

The list of honors achieved by Dr. Seldin during and after his chairmanship is as varied as it is long. Seven societies can lay claim to him as past president: the American Society of Nephrology, The Association of Professors of Medicine, the Association of American Physicians, the International Society of Nephrology, the Central Society for Clinical Research, the American Society for Clinical Investigation, the Southern Society of Clinical Investigation. Too numerous to list, his awards include the John P. Peters award from the American Society of Nephrology, the Kober Medal from the Association of American Physicians, and the Distinguished Teacher Award from the American College of Physicians.

Dr. Seldin's belief in the moral responsibilities shouldered by those in medicine continues to reverberate and be imprinted upon our trainees. His postwar encounters with Nazi medicine, seeing medicine used to create suffering, taught him to emphasize the importance of practicing humane medicine with integrity. To this day, Dr. Seldin's passion for discovery, his standards of professionalism and humanity, and his enthusiasm for training the next generation of physicians remains the bedrock upon which the department and university continue to build and expand.

> *"The paradigm of professions is surely the medical profession. We, all of us, are inheritors of the activities of people who have proceeded us, and who have devoted themselves to the mitigation of suffering".*
>
> - *Donald W. Seldin*

Without his guiding hand, it is no stretch to believe that UT Southwestern would have neither achieved its lofty heights in world-renowned research, nor would have trained so many gifted and successful physicians still serving in Texas and across the United States. Simply put, there is and was no UT Southwestern Medical Center without Donald W. Seldin.

Daniel W. Foster, M.D.
1930-2018

The third of five chairs of the Department of Internal Medicine at UT Southwestern, Daniel W. Foster was a pioneering force in patient care, education, and research throughout his entire career, including his time at UT Southwestern.

After graduating from UT Southwestern medical school at the top of his class, Dr. Foster followed his residency at Parkland Memorial Hospital with a research fellowship at the National Institutes of Health. He returned to UT Southwestern at the behest of Drs. Donald Seldin, Michael Brown, and Joseph Goldstein. In a spectacular 3-decade collaboration with his scientific partner, Dr. J. Denis McGarry, Dr. Foster discovered the malonyl-CoA regulatory system --detailing its fundamental role in fuel metabolism, fatty acid oxidation and ketone body formation.

As Department Chair from 1987 to 2003, Dr. Foster spearheaded Internal Medicine's remarkable academic growth, recruiting numerous outstanding faculty who went on to establish their own successful careers at UT Southwestern. His bold vision for the Department enabled the launch of the transformative Dallas Heart Study on his watch.

Dr. Foster's seminal contributions to academic Internal Medicine were widely recognized. His many honors included election to the National Academy of Medicine, the American Society for Clinical Investigation, and the Association of American Physicians, as well as the Banting Medal for Scientific Achievement from the American Diabetes Association. He was equally committed to the education and training of students and residents. He served as Headmaster of the Academic Colleges at UT Southwestern, President of the Academy of Medicine, Engineering, and Science of Texas, and was named an Outstanding Physician Educator in Diabetes by the American Diabetes Association. Dr. Foster's patients greatly appreciated his counsel, kindness, and personal warmth – and to this day reflect upon him fondly as they return to UT Southwestern for their care.

Dr. Foster's legacy of integrity, education, research, and patient care remains etched into the mission of the Department of Internal Medicine, and his leadership by example continues to serve as a guiding light to UT Southwestern.

Jean Wilson, M.D,

This year, we also celebrate Jean D. Wilson, M.D., one of Dr. Seldin's earliest and arguably most accomplished trainees. Dr. Wilson's preeminent research has focused upon the genetic basis of disorders of sexual differentiation. Among his many many accomplishments, Dr. Wilson with his physician-scientist trainee, Nicholas Bruchovsky, discovered the hormone dihydrotestosterone (DHT) and 5-alpha reductase -- the enzyme required for intracellular DHT biogenesis. Via their outstanding mentorship and development of innovative programs to train physicians as scientists, Drs. Wilson and Seldin created our culture of enthusiasm for residency research that lives in our Department today.

2018 Seldin Scholar, Dr. Ezim Ajufo, the Foster Fellows with their faculty mentors, Case Presentation winners, Dr. Salahuddin Kazi, Dr. Michael Brown and Dr. Ellen Taylor Seldin

Markey McNutt, II, M.D., Ph.D.

Markey McNutt, M.D., Ph.D. was born and raised in Tulsa, Oklahoma. He attended Oral Roberts University and graduated with a degree in biomedical chemistry. He performed bioinformatic research as a post-baccalaureate fellow in the lab of Kevin Gardner at the National Cancer Institute, National Institutes of Health before moving to Dallas to attend medical school. Dr. McNutt joined the UT Southwestern (UTSW) Medical Scientist Training Program in 2003 and received his MD and PhD degrees in 2010. He performed his PhD research in the laboratory of Dr. Jay Horton studying the role of PCSK9 in the molecular mechanisms that control cholesterol levels in humans. After graduating, Dr. McNutt continued his clinical training completing a residency in internal medicine and fellowship in endocrinology, diabetes, and metabolism as part of the Physician Scientist Training Program. In fellowship, he worked in the laboratory of Dr. Helen Hobbs and Dr. Jonathan Cohen trying to better understand the metabolism of fatty acids in fasting and refeeding. During this time, Dr. McNutt became passionate about rare genetic metabolic disease and returned to training to complete a residency in clinical genetics at UTSW before joining the faculty as an assistant professor of genetics and metabolism in the McDermott Center for Human Growth and Development, Department of Internal Medicine, and Department of Pediatrics. He is board certified in Internal Medicine, Endocrinology, and Clinical Genetics. He splits his efforts between seeing patients in the clinic, performing translational research into rare and undiagnosed genetic diseases, performing clinical trials for new treatments of rare metabolic disease and leading educational activities for medical students, graduate students, and medical residents and fellows.

Thursday, May 9th

12:00-3:00pm: Trainee Poster Presentations, Eugene McDermott Plaza
4:00-5:30pm: Seldin Symposium Reception, A.W. Harris Faculty Club

Friday, May 10th

Internal Medicine Grand Rounds
Markey McNutt II, M.D., Ph.D
Assistant Professor, Department of Internal Medicine
Eugene McDermott Center for Human Growth and Development
"The Genetic Basis of Heritable Disease"
In honor of Dr. Jean Wilson and Dr. Donald Seldin
Eugene McDermott Lecture Hall, D1.502

Friday, May 17th

Internal Medicine Grand Rounds
Oral Abstract Presentations by Foster Fellow Finalists
Audience vote selection of Seldin Scholar
Eugene McDermott Lecture Hall, D1.502

Presentation #1

Title: Preferred treatment modality for radiation proctitis - survey of practicing clinicians in the United States

Presenter: Adil Faqih

Authors: Adil Faqih, MD; Jeffrey Lee, MD, MAS; Deepak Agrawal, MD

Faculty Mentor: Deepak Agrawal

Abstract

Background: Chronic hemorrhagic radiation proctitis (CHRP) develops in 2-20% of patients undergoing radiation treatment for For many malignancies of the lower gastrointestinal tract and pelvis. The symptoms of CHRP include rectal/anal pain, tenesmus, incontinence and rectal bleeding which may result in emergency rom visits, hospital admissions and blood transfusions. Current therapies include 5- aminosalicylic acid (5-ASA) and steroid enemas, local application of formalin, ablation with argon plasma coagulation (APC), radiofrequency, hyperbaric oxygen, and surgical resection. Published data on efficacy is most robust for formalin and APC. There is no consensus on preferred treatment modality and no data on how clinicians choose a particular treatment and if it differs between radiation oncologists and gastroenterologists.

Methods: A survey was developed and then validated with input from 4 gastroenterologists and 4 radiation oncologists. The survey included questions on preferred first line and second line treatments for CHRP and the rationale. The survey was distributed to radiation oncologists and gastroenterologists at 5 university hospitals.

Results: Of the 30 surveys completed, 22 were from Gastroenterologists and 8 from Radiation Oncologists. Amongst the Radiation Oncologists, 3 preferred to treat CHRP themselves rather than refer upon initial diagnosis. Two used steroid enemas and hyperbaric oxygen and one used steroid or 5-ASA suppository. In the event of failure of these treatments, the patients was referred to Gastroenterology for further care. Among the gastroenterologists, 21 out of 22, used APC as the preferred initial treatment (95.5%), although 4 (18%) stated that they also used Sucralfate enemas. One (4.5%) gastroenterologist used radiofrequency ablation as the initial treatment. Other treatment modalities used by gastroenterologists included Sucralfate enemas (15/22; 68%), 5-ASA enemas (7/22; 31.8%), steroid enemas (6/22; 27.2%), radiofrequency ablation (3/22; 13.6%), laser therapy (1/22; 5%), and hyperbaric oxygen (4/2; 18.2%). Formalin had only been used by 3 out of 22 (13.6%). Reasons why formalin was not used included unfamiliarity with the procedure (15/22; 68.1%), uncertainty of the supporting evidence (10/22; 45.5%) and difficulty in obtaining the medication (4.5%).

Conclusions: Radiation proctitis is mostly treated by gastroenterologists who mostly prefer APC as the initial treatment. Formalin was not a commonly utilized treatment modality despite substantial evidence supporting likely due to unfamiliarity with the procedure and the supporting data.

Presentation #2

Title: Pericardial Effusion After Irradiation of a Thoracic Paraganglioma

Presenter: Akanksha Neeraj Sharma

Authors: Akanksha Neeraj Sharma, MD; Genevieve Maquilan, MD; Kenneth D. Westover, MD, PhD

Faculty Mentor: Kenneth D. Westover

Abstract

Case Presentation: A 46-year-old male with a history of hypertension requiring 4 antihypertensive medications presented with new-onset chest discomfort. A computed tomography (CT) of the chest showed a mediastinal mass with compression and displacement of the great vessels, but no invasion of adjacent organs. Biopsy of the mass showed cells with hyperchromatic nuclei and scant cytoplasm in a dense fibrous and vascular stroma, and immunohistochemistry stained positive for chromogranin and synaptophysin, consistent with a paraganglioma. This was further supported by elevated serum and urine metanephrines. As the paraganglioma was considered inoperable given proximity to the great vessels, definitive radiation therapy was recommended. Seven 6-MV photon beams were used to deliver intensity modulated radiation to a dose of 54Gy to the planning target volume (PTV) in 30 fractions over 43 elapsed days. 3 months following therapy, a CT chest showed development of a moderate pericardial effusion. He was asymptomatic at that time but was admitted for expedited workup, and required a pericardiocentesis for fluid removal and colchicine for 90 days. Subsequent echocardiograms obtained 3 and 4 months after showed no recurrence and the patient demonstrated reduction in blood pressure and metanephrine levels.

Discussion: Here we present a patient with a mediastinal paraganglioma, and following definitive therapy with radiation developed pericarditis. We review radiation treatment-related risk factors and possible etiologies for development of pericarditis. Pericarditis is an uncommon cardiovascular toxicity following modern radiation therapy to the mediastinum. Various models have been constructed to predict the likelihood of pericarditis secondary to radiation therapy with subsequent development of dosing constraints for radiation to the mediastinum. By applying these models to our patient, the risk of developing radiation-induced pericardial effusion was low and it is unlikely that this was the dominant process involved. This patient's pericarditis more likely developed following tumor necrosis. The cell death resulting following radiation results in necrotic cells providing a powerful stimulus for a local inflammatory response resulting in accumulation of fluid in the pericardial space. This case presentation provides the opportunity to discuss documented risk factors related to radiation-associated pericardial effusions and provides a useful framework for evaluation and management.

Presentation #3

Title: Solid Organ Transplantation and Data Mining: Epidemiology of Multidrug-resistant Bacterial Infections in Solid Organ Transplant Recipients

Presenter: Alfredo Puing

Authors: Alfredo Puing, MD; Ricardo La Hoz, MD

Faculty Mentor: Ricardo La Hoz

Abstract

Background: Solid organ transplant (SOT) recipients are disproportionately affected by multidrug-resistant (MDR) bacterial infections, specially shortly after transplantation, which can lead to a 6-month mortality as high as 39%. Studies addressing the incidence, risk factors, and mortality of MDR bacterial infections after SOT have been limited to a specific: type of SOT (i.e. heart, lung), infection site (i.e. bacteremia), and/or bacteria class (i.e. gram-negative or gram-positive bacteria). To our knowledge, there is no study simultaneously describing the impact of the different MDR bacterial infections after SOT in all types of organ transplant.

Methods: Retrospective single center cohort study. Data mining tools were used to extract data from the medical record and merged it with information from the scientific registry of transplant recipients (SRTR). Recipients of their first SOT from 2010-2016 were included. Medical records of subjects with a positive culture for bacterial organisms of interest (Achromobacter spp, Acinetobacter baumannii, Burkholderia cepacia complex Enterococcus faecalis, Enterococcus faecium, Escherichia coli, Klebsiella oxytoca, Klebsiella pneumoniae, Pseudomonas aeruginosa, Staphylococcus aureus and Stenotrophomonas maltophilia) up to one-year post-transplantation were reviewed. Antibiotic resistance of each isolate was determined using the 2019 CLSI breakpoint standards, MDR bacteria was defined using the proposed CDC/ECDC standard definition and infections were adjudicated using CDC/NHSN criteria. The one-year cumulative incidence of MDR bacterial infections and one-year post-SOT survival following a MDR bacterial infection were calculated using the Kaplan-Meier method.

Results: The incidence of MDR bacterial infections was 9.0% at one year. Heart and Lung transplantation had the highest cumulative incidence of MDR bacterial infections (9.6% and 9.4%) in relation with others single-SOT. MDR Escherichia coli and Vancomycin-resistant enterococci were the main MDR bacterial pathogens leading to infections. Urinary tract infection (UTI) and pneumonia were the two main sites of infection. The one-year post-SOT survival on patients who acquired an MDR bacterial infection was 75.5% (vs. 93.9%).

Conclusions: MDR bacterial infections predominantly affects multi-organ, heart and lung transplant recipients. MDR bacterial infection during the first year after SOT was associated with a reduced survival. This study illustrates the potential of data mining tools to study infectious complications in SOT recipients.

Presentation #4

Title: Emergency Department Utilization by HIV-positive Released Jail Detainees

Presenter: Alfredo Puing

Authors: Alfredo Puing, MD; Ank Nijhawan, MD

Faculty Mentor: Ank Nijhawan

Abstract

Background: The US incarcerated population has up to five times the rate of HIV as the general population. Incarceration disrupts the HIV care utilization with only 30% of individuals retained in HIV care after 6 months from being released to the community. Major gaps in HIV care cascade in the post-release period may result in inappropriate Emergency Department (ED) use. This study aimed to describe and determine predictors of ED utilization by HIV-positive individuals in the 12 months following jail release.

Methods: This was a single-site retrospective cohort study. ED utilization among HIV-positive individuals released to the community from the Dallas County Jail (DCJ) between January 2011 and November 2013 was analyzed by matching DCJ release records to ED data for 44 local hospitals from the Dallas-Fort Worth Hospital Council Foundation's database. Multivariate logistic regression model was used to identify predictors of ED utilization and the New York University ED visit severity algorithm was used to classify visits to the ED based upon diagnosis.

Results: ED utilization was higher in the first two months after jail release. Female gender, receiving disability benefits, history of sexual abuse, and delayed linkage to HIV care after jail release were associated with high ED utilization. Hispanic ethnicity and reported prior antiretroviral therapy adherence were predictors of low ED utilization. HIV-positive released jail detainees had higher percentage of mental-illness and drug-use-related ED visits than the general population. The overall rate of linkage to care within 90 days of release from incarceration was 30%.

Conclusions: Interventions to optimize ED utilization among HIV-positive released jail detainees should be tailored to high-risk vulnerable populations: women, history physical or sexual abuse, and persons with physical disabilities. Further efforts are needed to improve the transition from jail to community HIV care.

Presentation #5

Title: Association of Galectin-3 with Diabetes Mellitus in the Dallas Heart Study

Presenter: Amy Vora

Authors: Amy Vora, MD; James A. de Lemos, MD; Colby Ayers, MS; Justin L. Grodin, MD, MPH; Ildiko Lingvay, MD, MPH, MSCS

Faculty Mentor: Ildiko Lingvay

Abstract

Background: Galectin-3 is a novel biomarker associated with inflammation and fibrosis in cardiac, liver and renal disease. Galectin-3 is higher in overweight and obese individuals; whether an association with diabetes exists independent of weight is unknown. Objective: To evaluate if galectin-3 is associated with diabetes mellitus. **Methods:** We performed measurements of galectin-3 among participants in Dallas Heart Study (DHS) 1 and 2 (N=3392 and N=3194, respectively). Of these, 1989 participants were evaluated longitudinally in both studies. Associations of galectin-3 with prevalent and incident type 2 diabetes were determined using logistic regression models. Associations of galectin-3 with relevant biomarkers and fat compartments were evaluated using spearman correlation coefficients and multivariable linear regression models, respectively. Setting and participants: DHS is a population-based single site multi-ethnic study conducted in Dallas County, Texas, with oversampling to comprise 50% African Americans.

Results: Galectin-3 levels were associated with diabetes prevalence in both DHS-1 [OR 1.56 per standard deviation change in log-galectin (95%CI 1.41-1.73)] and in DHS-2 [OR 1.86 (95%CI 1.67-2.06)]. Galectin-3 levels in DHS-1 also associated with incident DM over the 7.1 [IQR 6.6-7.6] year follow-up period [OR 1.34 (95%CI 1.14-1.58)]]. These associations maintained significance in models adjusted for traditional metabolic risk factors (age, gender, race, BMI, and hypertension) and renal function. Galectin-3 levels correlated with levels of biomarkers implicated in inflammation (hsCRP, IL-18, MCP-1, sTNFR1A, MPO), insulin secretion (C-peptide and C-peptide/HOMA-IR), and subcutaneous adiposity.

Conclusions: Galectin-3 is associated with diabetes prevalence and incidence, possibly through the inflammatory pathway contributing to beta-cell fibrosis and impaired insulin secretion.

Presentation #6

Title: Comparison of clinical outcomes in young-onset colorectal cancers based on ethnicity in NCI Designated Comprehensive Cancer Center

Presenter: Benjamin Fangman

Authors: Benjamin D Fangman, MD; Stephan Haff; Shannon Scielzo, PhD; Aravind Sanjeevaiah, MD; Udit Verma, MD; John Cox, MD; Radhika Kainthla, MD; Muhammad Shaalan Beg, MD; Syed Kazmi, MD

Faculty Mentor: Syed Kazmi

Abstract

Background: Ethnic disparities in health resources can impact the clinical outcomes of young-onset colorectal cancer (CRC) patients. We aimed to determine the differences in clinical outcomes based on ethnicity in young -onset CRC treated in a safety-net hospital and the cancer center that comprise an NCI-designated comprehensive cancer center program.

Methods: A retrospective review of charts for stage II - IV young-onset colorectal cancer patients <45 years old, diagnosed between 04/2011 and 11/2015. Patients had to undergo treatment at safety-net Parkland County Hospital or at the Simmons Comprehensive Cancer Center (SCCC) in Dallas, TX. Demographic data, race, and ethnicity, dates of surgery, adjuvant chemotherapy, recurrence or death were obtained.

Results: Total of 123 patients met inclusion criteria, 15 were excluded due to incomplete information (Table 1). Out of remaining 108 patients, 36 (33%) and 72 patients (67%) received treatment at SCCC and Parkland hospitals, respectively. Sixty (55%) patients belonged to non-Hispanic ethnicity while 48 (44.4%) identified as Hispanic. Stage IV disease at presentation was more frequent in SCCC vs. Parkland (58.3% vs 30.6%, $p< 0.01$), but it was not different in regards to ethnicity. There was also no significant difference between White, Hispanic and Black patients regarding median days to colectomy (1 vs. 13 vs. 0; p=.402) and median days to adjuvant chemotherapy (55.5 vs 53.0 vs 64.0 days, p=.820). Hispanic patients had significantly better overall survival (OS) than Black or non-Hispanic White patients (p=0.025; Table 1). The OS benefit was driven by improved 5-year overall survival in stage II/III Hispanic patients vs. non-Hispanic white or Black patients (95% vs 62% vs. 60% p = 0.06; Figure 2). Multivariate Cox Regression analysis showed stage II/III ($p< 0.001$) and Hispanic ethnicity ($p< 0.001$) as independently associated with improved outcomes in the cohort.

Conclusions: In young-onset colorectal cancer treated at NCI-designated comprehensive cancer center, Hispanic ethnicity had better survival than other ethnicities., and this was likely due to better outcomes in Hispanic in stage II and III colon cancer. The causes for these ethnic differences in young-onset CRC patients need further exploration.

Presentation #7

Title: Documenting Bone Health for Veterans with Rheumatoid Arthritis in an Outpatient Academic Clinic

Presenter: Brittany Ahmed

Authors: Brittany Ahmed, MD; Rabih Nayfe, MD; Akrithri Udupa, MD; Una Makris, MD; Rashmi Arora, MD; Swathi Reddy, MD

Faculty Mentor: Swathi Reddy

Abstract

Background: Rheumatoid arthritis (RA) increases the risk of bone density abnormalities such as osteoporosis, predisposing patients to fragility fractures and subsequent morbidity. Bone density assessment in RA patients is not always evaluated in routine clinical practice despite guidelines suggesting its importance. Trainees in the rheumatology clinic do not routinely document or manage bone health in these patients. The aim of this quality improvement project was to increase documentation rate of bone health in RA patients seen by residents and fellows in the Dallas VAMC rheumatology clinic from the 3 month average of 58% to 70% (stretch goal 80%) between February and April 2018.

Methods: Pre-intervention documentation rate of bone health was measured by reviewing 50 fellows' and 50 residents' RA clinic visit notes between August and October 2017. Patients seen by the authors were excluded. Intervention: In December 2018, a "Bone Health" prompt was added to the RA note template, reminding physicians to document bone health status, FRAX score, and recommendations. In order to facilitate the intervention, fellows were educated about the importance of bone health documentation and informed about the QI project at a Grand Rounds conference. Additionally, flyers reminding all residents and fellows about the template were posted in exam rooms at the VA. Post-intervention data were collected between February and April 2018, using the same process.

Results: The pre-intervention documentation rate among both 1st and 2nd year rheumatology fellows and residents (Internal Medicine, PM&R) was 58%. The post-intervention rate improved among both fellows and residents to 82% and 70% respectively (n=50 patients per subgroup), meeting the set goal of our project.

Conclusion: Adding a "Bone Health" prompt to the RA office visit template improves the documentation rate of bone health, as shown by improvement in the post-intervention chart review. Fellows had a greater documentation rate in their post-intervention results than did residents, potentially due to more frequent exposure to this topic. In the future, we plan to analyze if the increased documentation rate translated into improved rates of guideline concordant management of decreased bone density in this vulnerable population.

Presentation #8

Title: Comparison of Pharmacy Refill Data with Therapeutic Drug Monitoring (TDM) in Assessing Non-Adherence to Cardiovascular Drugs in Patients with Uncontrolled Hypertension

Presenter: Bryan Boyuan Wu

Authors: Bryan Wu, MD; Shishir Sharma, MD; Hamza Lodhi, MD; Kevin Schesing, MD; Sandeep Das, MD; Nancy Brown, MD; Elizabeth Moss, PharmD; Ethan A. Halm, MD; Wanpen Vongpatanasin, MD

Faculty Mentor: Wanpen Vongpatanasin

Abstract

Background: Pharmacy refill data are frequently used to screen for medication non-adherence. However, its accuracy remains unknown as patients may receive automatic refills but never take the drug as prescribed. Therefore, we evaluated the accuracy of refill data in assessing non-adherence to cardiovascular medications against TDM in patients with uncontrolled hypertension.

Methods: We performed a prospective observational study in patients recruited from the Parkland Cardiology Clinic and Parkland Center for Internal Medicine (PCIM). Patients who had blood pressure of >130/80 mmHg, were on ≥2 antihypertensive medications, and verbally reported full medication compliance were enrolled in the study after an informed consent. Plasma samples were obtained for measurement of 36 cardiovascular drugs including statins, using liquid chromatography mass spectrometry assay.

Results: Among 38 patients enrolled in our study, 21% (8/38 patients) were non-adherent to at least 1 antihypertensive medication, while 39% (12/31 patients) were non-adherent to statin drugs. The non-adherent patients were younger than the adherent patients (57.2±12.0 vs. 62.9±7.8, respectively; p=0.08), and were less likely to be African Americans (41% vs. 76%, p<0.05). The non-adherent group to statin drugs had significantly higher LDL level than the adherent group (112±41 vs. 70±21 mg/dL, p<0.04). The adherent group to antihypertensive medications had similar blood pressures as the non-adherent group (145±12.8/82±9.8 vs.146±9.6/87±12.9 mmHg). The 90-day Proportion of Days Covered (PDC) refill data are available in only 19 of 38 patients, and there was no significant correlation between PDC and TDM results (r2=0.15, p=0.11). Using a PDC threshold of < 80%, low PDC has a sensitivity of 100% and a specificity of 63% in detecting medication non-adherence when compared to TDM.

Conclusions: Medication refill data have limited specificity in detecting medication non-adherence when compared to TDM. Its availability is also limited to only 50% of patients who regularly filled prescriptions at Parkland. Since 20-40% of patients with uncontrolled hypertension are non-adherent to at least 1 cardiovascular drug, TDM constitutes a more efficient and reliable way to assess medication non-adherence, which is crucial in optimizing cardiovascular risk factors in this indigent population.

Presentation #9

Title: Uncommon Case of Hydralazine Induced Vasculitis

Presenter: Camli Al-Sadek

Authors: Camli Al-Sadek, MD; Bonnie Bermas, MD

Faculty Mentor: Bonnie Bermas

Abstract

Hydralazine induced vasculitis can be characterized by ANCA and ANA positive crescentic glomerulonephritis with some Class IV lupus nephritis pathology. It is an uncommon presentation overlapping with drug induced lupus. A 62 year-old female with past medical history of secondary hypertension due to hyperaldosteronism, hyperlipidemia, and osteoarthritis presented with 1 week of progressive bilateral lower extremity edema and dyspnea at rest. She was admitted to the hospital and found to have nephrotic range proteinuria, new onset renal insufficiency, and anemia requiring blood transfusions. During her admission nephrology was consulted and performed a renal biopsy. Rheumatology was consulted as well, given concern for new onset lupus causing lupus nephritis. Her labs showed a high ANA titer, positive anti-histone antibody, positive p-ANCA, elevated ESR and CRP, hypocomplementemia, negative c-ANCA, and a negative dsDNA antibody. Her home hydralazine was discontinued during that admission due to concern for drug induced lupus. She had no other findings suggestive of lupus. Her renal function remained decreased but stable throughout the admission and she was discharged on PO Lasix. Renal biopsy resulted after discharge and showed diffuse proliferative and sclerosing glomerulonephritis with moderate interstitial fibrosis, tubular atrophy, moderate arteriosclerosis, and global glomerulosclerosis. She was started on mycophenolate and prednisone. She presented again several weeks later with fevers, altered mental status, and pleural effusions. Her kidney function was further depressed necessitating hemodialysis. She was treated with high dose steroids given concern for a drug induced lupus flare. Her pleural effusions were partly thought to be due to an auto-immune process. Her hospital course was complicated by recurrent C. diff infections, bullous rash, pneumonia, and hypoxic respiratory failure necessitating intubation.

This patient's presentation along with her serologies and biopsy results are not fully characteristic of lupus and are more consistent with a hydralazine induced vasculitis with drug induced lupus overlap syndrome given the crescentic component. Hydralazine induced vasculitis is relatively rare in the literature. Its criteria is evolving as more suspected cases are identified. Review of the literature indicates that patients with hydralazine induced vasculitis typically have a more severe course than drug induced lupus alone.

Presentation #10

Title: Ethnic disparities in atherosclerotic cardiovascular disease prevalence among rheumatoid arthritis patients: a systematic review

Presenter: Christina Mosher Daniel

Authors: Christina Daniel, MD; Lesley Davila, MD; Una Makris, MD; Helen Mayo, MLS; Blair Solow, MD

Faculty Mentor: Blair Solow

Abstract

Background: Rationale Rheumatoid arthritis (RA) is known to be associated with increased atherosclerotic cardiovascular disease, which may be due to chronic systemic inflammation, medications, genetic effects, or other means. Isolated cohorts have shown that African Americans have greater, whereas Hispanic Americans have lower cardiovascular disease prevalence compared to Caucasians, and the reasons for these findings are not clear. This systematic review seeks to better describe the incidence and prevalence of atherosclerotic cardiovascular disease stratified by ethnicity within the rheumatoid arthritis population across the United States. Objectives / Hypothesis Our hypotheses are that African Americans have a greater prevalence of cardiovascular disease compared to Non-Hispanic Whites while Hispanics have a lower prevalence of cardiovascular disease compared to Non-Hispanic Whites.

Methods: MEDLINE, EMBASE, and Cochrane databases were searched for studies that reported prevalence of atherosclerotic cardiovascular disease as well as the proportions of various ethnicities who have rheumatoid arthritis. Abstracts and full texts were screened separately for inclusion by two reviewers with a third reviewer available to resolve discrepancies.

Results: Findings In total, 1867 abstracts were screened and 118 underwent full text review. From these, 18 studies were included. It was found that no publications reported atherosclerotic cardiovascular disease stratified by ethnicity. If papers reported more than just one ethnicity (i.e. Caucasians) in the cohort, the corresponding author was contacted to see if they had cardiovascular disease rates stratified by ethnicity. Only two authors have replied thus far, and statistical analysis is ongoing.

Conclusions: Implications This systematic review found that there is a dearth of research on racial and ethnic disparities in atherosclerotic cardiovascular disease prevalence in the United States rheumatoid arthritis population. Further conclusions await additional feedback from authors whose publications were included in the study. These findings demonstrate a need to study more ethnically diverse cohorts such as that of our own county hospital to generate more data on these populations.

Presentation #11

Title: The association of leukocyte immunoglobulin-like receptor B4 (LILRB-4) with central nervous system involvement in patients with acute myeloid leukemia.

Presenter: Colin Bergstrom

Authors: Colin P. Bergstrom, MD; Weina Chen, MD, PhD; Cheng Cheng Zhang, PhD; Prapti Patel, MD; Madhuri Vusirkala, MD; Praveen Ramakrishnan, MD; Syed Rizvi, MD; Stephen Chung, MD; Farrukh Awan, MD: Larry Anderson, MD, PhD; Robert Collins, MD; Ankit Kansagra, MD

Faculty Mentor: Ankit Kansagra

Abstract

Background: The prevalence of central nervous system (CNS) involvement in patients with acute myeloid leukemia (AML) is variable with a reported range of 0.6% to 46%. Unfortunately, the clinical consequences of untreated CNS involvement in AML which include complete paraplegia and bilateral total blindness, can be devastating. In addition, both the diagnostic evaluation and treatment of CNS involvement are associated with potential significant morbidity. Thus, there is a need to predict CNS involvement in a noninvasive manner in patients with AML. The leukocyte immunoglobulin-like receptors are a family of receptors that regulate the activity of cancer stem cells, cancer development and relapse. These receptors are expressed on many cell types and the leukocyte immunoglobulin-like receptor B4 (LILRB-4) is expressed on monocytic myeloid cells. Purpose: To investigate whether measurement of LILRB-4 is predictive of CNS involvement in patients with AML.

Methods: Fifty-six patients with AML and followed at the University of Texas Southwestern medical system had measurement of the LILRB-4 by flow cytometry. Demographic, laboratory, risk stratification, cytogenetics and clinical variables were acquired from electronic medical chart review.

Results: The study cohort of 56 patients with AML had a median age of 60 years (range: 0.83 - 92); 52% male; and racial/ethnic composition of African American 20%, Asians 4%, White Hispanic 13% and White Non-Hispanic 64%. Eleven (20%) patients were diagnosed with CNS involvement (CNS+). LILRB-4 was positive in 91% of patients with CNS+ compared to 38% without CNS (CNS-) ($p<0.002$). In univariate logistic analysis: age, White Non-Hispanic and positive LILRB-4 (LILRB-4+) were statistically predictive for CNS+ [OR, 95% CI, p value]: 0.95, 0.92-0.99, $p<0.01$; 4.31, 1.08-17.25, $p<0.04$; 16.46, 1.93-140.2, $p<0.02$, respectively. Traditional risk factors such as white blood cell count, FLT-internal tandem duplication mutation, National Comprehensive Cancer Network (NCCN) risk stratification scheme and serum lactate dehydrogenase levels were not predictive for CNS+. A positive LILRB-4 has a sensitivity of 91% and specificity of 62% for CNS+.

Conclusions: A positive LILRB-4 by flow cytometry on leukemia cells is strongly associated with CNS involvement in patients with AML.

Presentation #12

Title: Elevated Plasma Caspase-3 Levels and the Subsequent Diagnosis of Gastrointestinal Cancer

Presenter: Colin Bergstrom

Authors: Colin Bergstrom, MD; Muhammad Beg, MD; Colby Ayers, MS; Ian J. Neeland, MD

Faculty Mentor: Ian Neeland

Abstract

Background: Caspases are cysteine-dependent aspartate-directed proteases that when activated form a cascade, resulting in programmed cell death, apoptosis. Paradoxically, apoptosis may trigger a compensatory proliferation in adjacent cells. Caspase-3, the master "executioner" during apoptotic cell death, reportedly serves as a putative direct link between apoptosis and compensatory induced proliferation. Elevated caspase 3 levels have been demonstrated in prevalent breast, gastrointestinal and prostate cancers. The relationship of caspase-3 with a subsequent cancer diagnosis in a large population-based cohort is unknown.

Methods: 3,032 participants without a diagnosis of cancer at the time of enrollment in the Dallas Heart Study (DHS) between 2000 and 2002 underwent a baseline measurement of plasma caspase-3. These participants were followed longitudinally for 12 years for a new diagnosis of cancer. The Texas Cancer Registry was linked to the DHS allowing for identification of incident or subsequent cancer (diagnosis after 1 year of enrollment).

Results: 178 participants without baseline cancer developed an incident cancer (IC+) at follow-up. Caspase-3 (median, ng/mL) levels were higher but statistically significant in subjects with IC+ compared to subjects without incident cancer (IC-): 3.04 vs 2.89, p=0.28. After adjustment for age, sex and race/ethnicity this relationship was statistically unchanged. When analyses were performed by type of cancer: gastrointestinal (GI), breast and prostate, caspase-3 was statistically significant for GI IC+ vs GI IC: HR (95% CI, P-value): 1.81 (1.09-3.00), p=0.022 after adjustment for age, sex, and race/ethnicity caspse-3 levels were not associated with incident breast or prostate cancer. Median follow-up for GI IC+: 5.9[IQR:2.8,8.9] years.

Conclusions: Elevated plasma caspase-3 levels are associated with incident GI cancer. Moreover, the antecedent elevated caspase-3 level years prior to the diagnosis of GI cancer combined with preclinical studies, suggests a role for caspase-3 in the pathogenesis of GI cancer. This finding may be potentially useful for risk stratification and as a biomarker for GI cancer.

Presentation #13

Title: Continuous Parenteral Prostanoids' Impact on Symptom Burden and Functional Class in Group III Pulmonary Hypertension

Presenter: Colin Hinkamp

Authors: Colin Hinkamp, MD; Trushil Shah, MD; Sonja Bartolome, MD; Fernando Torres, MD; Kelly Chin, MD

Faculty Mentor: Kelly Chin

Abstract

Background: Pulmonary hypertension (PH) is a common complication in patients with lung disease, but there are no FDA approved therapies. Small studies (post-hoc STEP-IPF, case series) suggest the potential for benefits with Group I PH therapies, particularly for those with more severe PH.

Methods: Retrospective case series including patients with severe Group III PH who initiated intravenous/subcutaneous epoprostenol or treprostinil between 2007-2016. Routine prognostic studies were obtained including hemodynamics, cardiac imaging, NT-proBNP/BNP, 6-minute walk distance (6MWD), WHO Functional Class (FC), resting and exertional O2-saturations were tracked at initiation and during clinical follow-up.

Results: Our study population included 8 patients (median age 66, IQR 18) who received parenteral prostanoids initiated 273 (IQR 650) days after the PH diagnosis. Lung diseases included IPF (3), CPFE (3), bronchiolitis obliterans and smoking-related interstitial fibrosis. All patients had severe PH, with mPAP >35 mmHg (N=7) or mPAP 25-35 with cardiac index (CI) <2.4 L/min/m2 (N=1). Lung function was variable: 4 patients had an FVC or FEV1 <50% predicted, while 4 had an FVC and FEV1 >50%, but with a DLCO <20% predicted and diffuse lung disease on imaging. All patients were oxygen dependent at baseline. Two received up-front IV/SC therapy, while six previously received non-parenteral therapies (triple therapy in two). Symptom burden remained considerable in all patients. FC remained constant (4 vs 4) while resting oxygen-requirement (2.5L vs 5L) and exertional oxygen-requirement (5L vs 8L) worsened. Many patients endorsed significant side effects including jaw pain, headaches, and diarrhea which limited up-titration of dosing. Ultimately 3 patients elected to discontinue IV/SC prostanoid therapy and transitioned to hospice care, all of whom died within one month.

Conclusions: In patients with severe Group III PH receiving parenteral prostanoids, patient-centered measures such as FC and oxygen-requirement remained constant or worsened, respectively, likely due to worsening ventilation-perfusion mismatch from non-selective vasodilation of the pulmonary vasculature. Furthermore, these therapies were poorly tolerated, leading almost half of patients to discontinue treatment and transition to hospice, suggesting parenteral prostanoids may have contributed to their already staggering symptom burden despite the modest benefit on hemodynamics. Further research into alternative therapies for Group III PH should be pursued.

Presentation #14

Title: Not Just Another Asthma Exacerbation: Fighting Anchoring Bias with Chest Radiographs

Presenter: Colin Hinkamp

Authors: Colin Hinkamp, MD; Snigdha Jain, MD; Traci Adams, MD

Faculty Mentor: Traci Adams

Abstract

Case Presentation: A 23-year-old female with newly diagnosed asthma presented to the hospital with a cough productive of yellow sputum and dyspnea. She had recently presented with similar symptoms two months prior to this episode. At that time, she was treated with bronchodilators and a short course of systemic steroids with improvement in her symptoms. Her physical exam demonstrated increased respiratory effort with accessory muscle use and crackles in the right upper and bilateral lower lung fields. Labs were remarkable for peripheral eosinophilia. Chest radiograph revealed rounded peripheral ground-glass pulmonary opacities in the bilateral lateral lungs. CT imaging confirmed this, revealing multifocal pleural-based consolidations in these areas. Bronchoscopy was performed with bronchoalveolar lavage analysis revealing 39% eosinophils, and confirmatory transbronchial biopsy revealing interstitial and intra-alveolar eosinophils. She was diagnosed with chronic eosinophilic pneumonia and improved with high dose systemic steroids.

Discussion: Chronic eosinophilic pneumonia (CEP) is an idiopathic disorder associated with eosinophilic inflammation in the lung. Half of patients with CEP have asthma and 90% have peripheral eosinophilia. Patients often respond rapidly to high dose steroids. The primary differential diagnosis includes other eosinophilic lung diseases such as allergic bronchopulmonary aspergillosis, drug-induced eosinophilic pneumonia, eosinophilic pneumonia due to fungi or parasitic infection, and eosinophilic granulomatosis with polyangiitis, as well as non-eosinophilic lung diseases with similar presentations such as cryptogenic organizing pneumonia. The internist's suspicion for CEP should be raised in patients with dyspnea, asthma, peripheral eosinophilia, and peripheral opacities on chest radiograph, classically described as the "photographic negative" of pulmonary edema.

Presentation #15

Title: Variation in the assessment of immune-related adverse event occurrence, grade, and timing

Presenter: David Hsieh

Authors: David Hsieh, MD; Mary Watters, MD; Rong Lu;, Yang Xie, PhD; David E. Gerber MD

Faculty Mentor: David Gerber

Abstract

Background: Accurate assessment of treatment toxicity is critical for patient safety, balancing clinical utility, and understanding treatment impact. Given their unpredictability and heterogeneity, immune-related adverse events (irAEs) may be particularly challenging to ascertain. Our objective was to evaluate the agreement between clinicians on the occurrence, grade, and timing of irAEs, and elucidate determinants of discordance.

Methods: Retrospective cohort study of 52 patients treated with immune checkpoint inhibitors at a National Cancer Institute-designated comprehensive cancer center. We analyzed algorithm-driven manual chart review in an electronic medical record system by two medical oncologist observers in the characterization of eight well-described irAEs (adrenal insufficiency, colitis, hepatitis, hyperthyroidism, hypophysitis, hypothyroidism, pneumonitis, rash).

Results: Median therapy duration was 50 days. An average of 123 documents were reviewed for each case. The incidence of irAEs ranged from 4-35% for observer 1 and 6-27% for observer 2, while aggregate incidence rates ranged from 8% (hypophysitis) to 40% (pneumonitis). Inter-rater agreement was generally limited for irAE incidence (κ 0.37 [hypophysitis]-0.8 [hypothyroidism]). Weighted κ similarly showed limited or poor agreement for most irAE grades (κ 0.31-0.75). Differences in the assessment of irAE time of onset ranged from 5-188 days. Rates of discordance were greater for grade 1 (39%) and grade 2 (41%) irAEs than for grade 3-4 (20%) irAEs. Multivariable analyses showed that therapy duration (OR 1.04, P<0.01) and a high Charlson Comorbidity Index (OR 5.85, P=0.03) were significantly associated with discordant irAE assessment.

Conclusions: Inter-rater reliability varied among irAEs and consistently showed poor agreement for the incidence, severity, and timing of irAEs. In general, agreement was greater for irAEs with distinct laboratory-based definitions (eg, hypothyroidism), higher-grade irAEs, and irAEs in patients with fewer comorbidities and shorter immunotherapy duration. These findings have implications in the clinical management of patients receiving immunotherapy and in the reporting of immunotherapy clinical trials.

Presentation #16

Title: "Molecular glue" indisulam induces RBM39 degradation and splicing changes in acute myeloid leukemia

Presenter: David Hsieh

Authors: David Hsieh, MD; Maria Goralski; Omar Abdel-Wahab, MD; Deepak Nijhawan, MD, PhD

Faculty Mentor: Deepak Nijhawan

Abstract

Background: Indisulam is an aryl sulfonamide well tolerated in humans but having limited anticancer activity in across several solid tumor types. Indisulam was recently shown to alter the substrate repertoire of the CUL4-DCAF15 E3 ubiquitin ligase to induce proteasomal degradation of RNA binding motif protein 39 (RBM39), a leukemogenic factor. The objective of this study was to assess RBM39 degradation as a functional biomarker of indisulam sensitivity from patient derived acute myeloid leukemia (AML) specimens.

Methods: Patient AML cells derived from peripheral blood and bone marrow aspirates were isolated by density gradient separation and immunomagnetic bead-based cell separation. Freshly purified AML cells were exposed to increasing doses of indisulam and then collected for western blot and flow cytometry analysis. AML cells incubated with indisulam were also collected at serial time points and harvested for RNA-sequencing and quantitative polymerase chain reaction analysis.

Results: Analysis of 12 AML specimens with sufficient yields revealed a wide range of sensitivity to indisulam based on drug potency required for RBM39 degradation (IC50 ranging from 5nM to 400nM). There was close concordance in results between immunoblotting and an optimized flow cytometry based assay for the rapid detection of intranuclear RBM39 degradation showing a dynamic range of pharmacologic activity across 9 AML specimens. Analysis of normal human hematopoietic stem cells showed diminished sensitivity to indisulam. Analysis of basal DCAF15 RNA levels showed low DCAF15 expression in normal stem cells but no correlation between DCAF15 expression and indisulam sensitivity in AML cells. Indisulam exposure was associated with an altered RNA splicing profile in a subset of genes.

Conclusions: The discovery of splicing factors as vulnerabilities in AML opens a promising avenue of therapeutic development in a devastating disease. Short term *ex vivo* treatment with indisulam induces RBM39 degradation in a panel of patient derived AML including those with adverse molecular features and clinical diagnoses. Our work demonstrates the feasibility of rapidly assessing a functional biomarker of indisulam sensitivity which is instructive of therapeutic decisions in a disease where time to treatment often cannot be delayed. Flow cytometry-based detection of RBM39 degradation may also be used to monitor target engagement and treatment

Presentation #17

Title: Crowdfunding Medical Care: An Exploratory Comparison of Canada, the United Kingdom, and the United States

Presenter: Ezimamaka Ajufo

Authors: Sameh N. Saleh, MD; Ezimamaka Ajufo, BM, BCh; Richard J. Medford, MD

Faculty Mentor: Richard J. Medford

Abstract

Background: Despite considerable differences in their healthcare systems, crowdfunding for medical care has become an increasingly important part of the healthcare ecosystem in Canada (CAN), the United Kingdom (UK) and the United States (US). It is not known whether medical crowdfunding campaigns or the factors associated with the success of such campaigns differ between these settings.

Methods: GoFundMe (GFM) is the largest for-profit company in the medical crowdfunding arena, raising over $650 million dollars per year for healthcare costs. We conducted a cross-sectional analysis of GoFundMe (GFM) campaigns between February 2018 -2019 in CAN, the UK, and the US. Through web scraping, we directly extracted variables from 1000 campaigns under the "Medical" subheading of each country's GFM discovery webpage. The primary outcome was amount raised in US dollars. We explored descriptive statistics for numerical variables including a correlation matrix and performed a multivariate linear regression.

Results: The mean value raised per campaign for CAN, the UK and the US was $17,781 (σ = $17,712), $15,243 (σ = $29,547) and $48,647 (σ = $26,234), respectively. The mean fund-raising goal for US campaigns was $88,242 (σ = $180,758), CAN $31,149 (σ = $47,041) and UK $38,345 (σ = $87,309). US campaigns had a higher number of donors, Facebook shares, GFM hearts, but a shorter average length of fundraising. In all three countries, number of donors and fundraising goal were positively correlated with and predictive of total amount raised. Facebook shares correlated with amount raised, but were not predictive in logistic regression analysis. Length of campaign and number of words in text were not correlated with or predictive of total amount raised.

Conclusions: Fundraising campaigns in the US aimed to raise and ultimately did raise more money than those in the UK and CAN on the GFM platform. Factors associated with the success of campaigns were grossly uniform between the countries. Fundraising goal and number of donors were predictive of amount raised in all three settings while length of campaign, length of text and Facebook popularity were not. Further work is required to characterize fundraising trends in these and other countries.

Presentation #18

Title: Genetic Counseling and Germline Testing Among Patients with Young-onset Colorectal Cancer at a Safety-net Hospital

Presenter: Garrett Greenan

Authors: Garrett Greenan, MD; PoojaDharwadkar, MD; Amit Singal, MD; Caitlin, Murphy, PhD

Faculty Mentor: Amit Singal

Abstract

Background: Recent studies suggest up to 20% of younger patients (age <50 years) diagnosed with colorectal cancer (CRC) have germline mutations in cancer susceptibility genes. Few studies have characterized differences in genetic susceptibility by race/ethnicity. We examined differences in genetic counseling and germline testing in a diverse population of patients with young-onset CRC.

Methods: We identified patients newly diagnosed with young-onset CRC at a large, integrated safety-net system between January 2009 and June 2017. We manually reviewed electronic medical records for patient demographics, tumor characteristics including immunohistochemistry (IHC) for mismatch repair (MMR) protein deficiency, referral to genetic counseling, and results of germline testing.

Results: Of 319 patients diagnosed with young-onset CRC, 161 (50.5%) were Hispanic, 82 (25.7%) non-Hispanic black (NHB), and 61 (19.1%) non-Hispanic white (NHW). Family history of CRC in any relative was similar by race/ethnicity (24.8% Hispanic, 25.6% NHB, 27.9% NHW), although slightly more Hispanic (12.4%) and NHB (14.6%) patients had an affected first-degree relative than NHW (6.6%). A higher proportion of NHW patients (19.7%) had an affected second-degree-relative than other groups (9.9% Hispanic, 12.2% NHB). Across racial/ethnic groups, most patients received IHC testing for MMR protein deficiency (78.9% Hispanic, 81.7% NHB and 75.4% NHW). More Hispanic patients (n=30, 23.6% of patients tested) were MMR deficient compared to NHB (n=6, 9.0%) and NHW (n=6, 13.0%). The proportion of patients referred to genetic counseling differed by race/ethnicity: 60.9% of Hispanics were referred compared to 41.4% and 44.3% of NHB and NHW, respectively. 19 Hispanic patients were found to have a pathogenic mutation compared to 4 NHB and 6 NHW. We also identified 20 variants of uncertain significance in Hispanic patients, 3 in NHB, and 1 in NHW. Although 12 Hispanic, 2 NHB, and 2 NHW patients who had a germline mutation also had a positive family history, the majority of patients who received germline testing had no known family history of CRC regardless of race/ethnicity.

Conclusions: We observed racial/ethnic differences in referral to genetic counseling, receipt of germline testing, and number of germline mutations. The genetic landscape of CRC may extend beyond known mutations traditionally associated with CRC.

Presentation #19

Title: Warfarin-Induced Calciphylaxis

Presenter: Garrett Greenan

Authors: Garrett Garrett, MD; Ashwin Rao, MD; Abey Thomas, MD, SFHM, FACP

Faculty Mentor: Abey Thomas

Abstract

Case Presentation: 69 year old woman with atrial fibrillation on warfarin and unspecified connective tissue disease on prednisone presented to the emergency department (ED) with worsening, painful bilateral lower extremity skin lesions. She noted a mildly painful, non-healing left leg wound 3 months prior to presentation; then a 2nd similar lesion appeared on her right leg. She saw a physician who treated her with Bactrim and wound care for "chronic arterial/venous ulcer with superinfection" but her lesions enlarged and the pain worsened, leading to the ED visit. She denied fevers, chills, claudication, peripheral edema, and lower extremity trauma. Physical exam revealed a 7.4 cm left medial leg indurated eschar with serosanguinous drainage, and a 1.2 cm right posterior leg eschar without drainage. Laboratory data including serum creatinine, calcium-phosphate product, and parathyroid hormone levels were all normal. Inflammatory markers and uric acid levels were elevated. Left leg x-ray was unremarkable. Differential diagnosis included vasculitis, warfarin-induced skin necrosis, cold-precipitating proteins, stasis ulcer, severe peripheral arterial disease, neuropathic ulcer, and calciphylaxis. Skin biopsy of the right calf lesion was diagnostic of calciphylaxis. Warfarin was discontinued, prednisone tapered. She was started on pentoxyfylline, thrice weekly vitamin K and sodium thiosulfate, continuing at discharge with wound care and close dermatology follow-up.

Discussion: Calciphylaxis is a rare condition characterized by microvascular occlusions in adipose and dermal tissue, leading to painful, necrotic skin lesions due to tissue infarction. Typically seen in end-stage renal disease patients ("uremic calciphylaxis"), due to metabolic factors promoting extra-skeletal calcifications, but less commonly, it can be "non-uremic". Primary hyperparathyroidism, malignancy, alcoholic liver disease, connective tissue disease, glucocorticoid and warfarin use are risk factors for non-uremic calciphylaxis, as are low serum albumin, elevated serum parathyroid hormone, phosphorus, and calcium levels. Our patient's risk factors included glucocorticoid and warfarin use as well as her history of possible connective tissue disease. Her laboratory studies did not confer elevated risk. Non-uremic calciphylaxis is more commonly seen in females and has a predilection for the legs.

Presentation #20

Title: The Role of Inflammation in Patients with Chronic Kidney Disease and Depression: A Systematic Review and Meta-Analysis

Presenter: Gerard Martins

Authors: Gerard Martins, MD; L. Parker Gregg, MD, MSCS; Thomas Carmody, PhD; Dustin Le, MD; Madhukar Trivedi, MD; S. Susan Hedayati, MD, MHSc

Faculty Mentor: Susan Hedayati

Abstract

Background: Depression affects approximately 20% of patients with chronic kidney disease (CKD) and end-stage renal disease (ESRD) and may be mediated by an increased underlying inflammatory state. We conducted a systematic review and meta-analysis to characterize relationships between inflammatory biomarkers and depression in such patients.

Methods: A systematic PubMed literature search was conducted for studies of patients with CKD and ESRD evaluating levels of circulating inflammatory biomarkers previously reported to be associated with depression of chronic disease: albumin, C-reactive protein (CRP), high sensitivity CRP (hs-CRP), tumor necrosis factor-α (TNF-α), interleukin-1 (IL-1), and interleukin-6 (IL-6). Standardized mean differences (SMD) between individuals with and without depressive disorder were computed for each biomarker and analyzed using mixed-effects models. Correlations between biomarkers and severity of depressive symptoms were computed using Fisher's r to Z transformation.

Results: We identified 34 studies (5,652 participants) comparing biomarkers between depressed and non-depressed individuals. Individuals with depressive disorder had lower albumin, SMD (95% CI) -0.366 (-0.606, -0.126), p=0.004, and higher IL-6, SMD (95% CI) 0.418 (0.206, 0.631), p=0.002. CRP did not reach statistical significance, SMD (95% CI) 0.87 (-0.01, 1.76), p=0.05. There was no association between depression and hs-CRP, TNF-α, or IL-1 levels. There was significant heterogeneity across studies for all biomarkers except for IL-1. There were 22 studies (2,891 participants) investigating correlations between biomarkers and depressive symptoms. Depressive symptoms correlated negatively with albumin, r (95% CI) -0.249 (-0.356, -0.142), p<0.001, and positively with hs-CRP, r (95% CI) 0.279 (0.128, 0.429), p=0.003, and IL-6, r (95% CI) 0.328 (0.156, 0.500), p=0.002. No significant correlations were observed for CRP or TNF-α. Only 2 studies measured correlations between IL-1 and depressive symptoms, so this biomarker was not included in the correlation analysis. Publication bias was not significant for any biomarker, but there was significant heterogeneity across studies for all biomarkers.

Conclusions: Lower albumin and higher IL-6 were associated with both the presence and severity of depression, and hs-CRP correlated with depressive symptom severity in patients with CKD and ESRD. The effect of interventions to lower inflammation in patients with kidney disease and depression deserves further investigation.

Presentation #21

Title: Association of the New Peer Group-Based Methodology with the Reclassification of Penalty Status in the Hospital Readmissions Reduction Program

Presenter: Hussain Lalani

Authors: Hussain S. Lalani, MD, MPH; Cian McCarthy, MB, BCh, BAO; Muthiah Vaduganathan, MD, MPH; Kershaw Patel, MD; Colby Ayers, MS; Deepak L. Bhatt,MD MPH; James L. Januzzi Jr., MD; James A. de Lemos ,MD; Clyde Yancy, MD; Gregg Fonarow, MD; Ambarish Pandey, MD, MSCS

Faculty Mentor: Ambarish Pandey

Abstract

Background: Since the introduction of the Hospital Readmission Reduction Program (HRRP), readmission penalties have been applied disproportionately to institutions that serve low-income populations. To address this concern, the Centers for Medicare & Medicaid Services (CMS) introduced a new, stratified payment adjustment method in fiscal year (FY) 2019. We investigated whether the introduction of this new method was associated with a change in the distribution of penalties among hospitals.

Methods: In this retrospective cross-sectional study, hospitals included in the HRRP for FY 2018 and 2019 were identified. Penalty status for FY 2019 was determined based on both, old (non-stratified) and new (stratified) payment adjustment methodologies. Hospitals caring for the highest proportion of patients enrolled in both Medicare and Medicaid based on quintiles were assigned to the low socioeconomic status (SES) group. The primary outcome was net reclassification of penalty status among all hospitals for four targeted medical conditions (acute myocardial infarction, heart failure, chronic obstructive pulmonary disease, and pneumonia). We also analyzed penalty status among hospitals in the low SES group and in states participating in Medicaid expansion.
Results: 3,173 hospitals were analyzed. For FY 2019, the new versus old payment methodology was associated with an overall net down-classification in penalty status for all hospitals by 4% (79% to 75%; $p<0.001$) and a reduction in penalization of low SES group hospitals (92% to 78%; $p<0.001$). Among hospitals that were not in the low SES group (quintiles 1-4), the new payment method was associated with a small decrease in penalty status (net down classification of 1.5%; $p=0.01$). Among target medical conditions, the greatest reduction in penalties was observed among cardiovascular conditions (6.2%; $p<0.001$).

Conclusions: The new, stratified payment adjustment method for the HRRP was associated with a reduction in penalties across hospitals included in the program; the greatest reductions are observed among hospitals in the low SES group, reducing the unbalanced penalty burden carried by these hospitals. Sustained efforts are needed to better account for social determinants of health in the hospital performance models and to allow for more socially just and equitable distribution of performance-based financial incentives.

Presentation #22

Title: Pembrolizumab-Associated Adrenal Insufficiency

Presenter: Jananie Ramesh

Authors: Jananie Ramesh, MD; Paul Parisot; Emily Bowen, MD; Jessica Voit, MD

Faculty Mentor: Jessica Voit

Abstract

Case Presentation: A 79-year-old man with non-small cell lung cancer (NSCLC) was admitted for evaluation of 4 months of generalized weakness, fatigue and abdominal pain. Six months prior to admission, he had received pembrolizumab with good response. Recent imaging showed stable disease. He had chronic iron deficiency anemia, but extensive endoscopic work-up was unrevealing. Mesenteric ischemia, hepatobiliary disease and chronic infection were ruled out as causes for his abdominal pain. During the hospitalization, he was noted to have hypoglycemia, with blood glucose as low as 21 mg/dL. He had not received any hypoglycemic agents. AM cortisol was 5.8 mcg/dL. An hour after receiving 250 mcg cosyntropin, cortisol was 13.5 mcg/dL, consistent with adrenal insufficiency (AI). Serum ACTH was undetectable, confirming secondary AI. He was started on hydrocortisone, with improvement in hypoglycemia, weakness and abdominal pain.

Discussion: The symptoms of AI are non-specific, including fatigue, loss of appetite and abdominal pain. Secondary AI does not affect the mineralocorticoid axis and thus does not usually cause the electrolyte abnormalities seen in primary AI, making it a diagnostic challenge. It was our patient's incidentally noted hypoglycemia that ultimately led to the diagnosis of AI. Pembrolizumab is a PD-1 inhibitor used to treat NSCLC. Endocrinopathies are well-described adverse events associated with immune checkpoint inhibitor therapy. Thyroid dysfunction is the most common endocrinopathy seen with PD-1 inhibitors, but hypophysitis, AI, and insulin-dependent diabetes have also been reported. Given our patient's recent treatment with pembrolizumab along with a steady decline in serum ACTH during treatment, his AI was most likely an adverse effect of pembrolizumab. Key Point: When evaluating non-specific symptoms in patients treated with immune checkpoint inhibitors, clinicians must remain vigilant for endocrinopathies.

Presentation #23

Title: Telephone Intervention to Improve Quality and Safety After Percutaneous Coronary Intervention - 6 month Results

Presenter: Jeffrey Chidester

Authors: Jeffrey Chidester, MD; Daniel Bennett, MD; Kim Berger, MD; Laurie Beall, RN; Tiffany Denkins, RN; Chris Mathew, PharmD; Kristin Alvarez, PharmD, BCPS; Michael Luna, MD; Tayo Addo, MD; Rebecca Vigen, MD, MSCS; Sandeep R. Das, MD, MPH

Faculty Mentor: Sandeep R Das

Abstract

Note: This project was presented at the Seldin Conference in 2018; however, more data has been gathered on more patients and a historical control has been added

Background: Poor adherence to DAPT after PCI is associated with poor outcomes including stent thrombosis, rehospitalization, and mortality. Safety-net patients are at high risk for low adherence due to poor health literacy and financial constraints. Understanding and overcoming barriers to patient adherence to DAPT after PCI may reduce the risk of adverse outcomes in safety-net patients. A multidisciplinary team of Nurses, Pharmacists, Internal Medicine Residents, and Cardiologists designed and implemented a telephone-based intervention to improve adherence to DAPT after PCI at Parkland Health & Hospital System (PHHS), a safety-net hospital system in Dallas, Texas.

Methods: Beginning 9/1/17, nurses from the Parkland Cardiac Catheterization Laboratory called all patients 7, 30, and 90 days post-PCI. Patients were reminded of the importance of DAPT and asked if they had concerns about their medications. Specific issues that arose were handled via interventions such as: provision of vouchers for reduced-cost medications, change in pharmacy or medication to lower cost, appointment with clinicians to discuss medication, confirmation of active refills. The total number of patients with self-reported nonadherence was quantified, as was proportion of days covered (PDC) on DAPT at 6 months, defined as the total number of days filled in the first 6 months post-PCI divided by 180 days.

Results: From 9/1/17 - 2/28/18, 189 patients underwent PCI at Parkland. Of the contacted patients, 10% reported problems with medications requiring intervention. Of the total treated patients, 65% had prescriptions filled at PHHS pharmacies which allowed for manual calculation of adherence data. Median PDC was 94% at 6 months. A historical control (n=154) had a median PDC of 92% at 6 months. There was no significant difference (p=0.4) compared to this control.

Conclusions: A telephone-based intervention allowed for identification and resolution of potentially catastrophic barriers to DAPT adherence in 1 in 10 contacted patients. It was unable to significantly improve medication adherence as measured by PDC, indicating that this metric may not be an adequate measure in this setting.

Presentation #24

Title: Adrenal Insufficiency Secondary to AIDS-related Primary Adrenal Lymphoma

Presenter: John Marshall

Authors: Adil Faqih, MD; John Marshall, MD; Navid Sadeghi, MD, MPH

Faculty Mentor: Navid Sadeghi

Abstract

Case Presentation: A 57-year-old man with untreated HIV presented with acute, watery diarrhea and abdominal pain with progressive bilateral thoracolumbar back and flank pain. He also noted nausea, vomiting, fatigue, and postural lightheadedness. On physical examination, he was afebrile with a blood pressure of 104/68 and a pulse rate of 89. He was cachectic without palpable lymphadenopathy. His abdomen was scaphoid, and there was right upper quadrant and bilateral flank tenderness. Laboratory testing showed sodium of 118 mmol/L (reference range 135-145 mmol/L), potassium of 4.6 mmol/L (3.5 -5.0 mmol/L). Urine sodium and osmolality was 66 mmol/L and 362 mOsm/kg, respectively. Morning serum cortisol level was 6.6 ug/dL. Cortisol levels were 7.0 mcg/dL at 0, 30, and 60 minutes after ACTH stimulation testing. Serum aldosterone was undetectable. Serum leukocyte count was 5.44 k/uL (3.98-9.57 k/uL), and absolute CD4 cell count was 80 cells/uL (430-1800 cells/uL). HIV polymerase chain reaction testing showed 140,000 copies/mL. Abdominal computed tomography showed adrenal masses measuring 3.6x5.2 cm on the right and 6.5x5.4 cm on the left. Positron emission tomography-computed tomography (PET-CT) showed highly FDG-avid adrenal masses and mildly avid cervical, pericardial, and mesenteric nodes. Left adrenal mass core needle biopsy revealed high grade B-cell lymphoma with 100% KI-67 positivity, double expressing (MYC an BCL2) but not double-hit. In-situ hybridization for Epstein-Barr virus-encoded small RNA was negative. Lymphomatous marrow involvement was absent. Highly active antiretroviral therapy for HIV and hydrocortisone with fludrocortisone for adrenal insufficiency were initiated. For his lymphoma, he was treated with SC-EPOCH-RR regimen along with prophylactic intrathecal methotrexate.

Discussion: Fewer than 200 cases of primary adrenal lymphoma are reported, of which only 3 cases were associated with HIV. EPOCH-based regimens are superior to CHOP-based regimens in AIDS-related lymphoma (ARL), but optimal treatment for primary adrenal lymphoma or superiority between dose-adjusted or short-course EPOCH variations in ARL is unknown. Similarly, optimal treatment monitoring in ARL is unknown given PET-CT can be confounded with HIV.

Presentation #25

Title: A Mysterious Rash: Subacute Endocarditis Presenting as Leukocytoclastic Vasculitis

Presenter: Julie Sara Alexander

Authors: Julie S. Alexander, DO; Bonnie C. Prokesch, MD

Faculty Mentor: Bonnie C. Prokesch

Abstract

Case Presentation: A 65-year-old male with a nontender, diffuse, erythematous rash on his anterior lower extremities for over three months in duration presented to the hospital with fever, dyspnea, and worsening microcytic anemia accompanied by spread of the rash to the upper extremities. His blood cultures grew Viridans Streptococcus and a transesophageal echocardiogram revealed a damaged right aortic coronary cusp with flail motion and vegetation with severe aortic regurgitation consistent with subacute infectious endocarditis. Skin biopsy of the right thigh revealed perivascular inflammation with neutrophilic infiltration consistent with leukocytoclastic vasculitis. He was started on ceftriaxone and eventually underwent aortic valve replacement with subsequent complete resolution of his skin lesions.

Discussion: Leukocytoclastic vasculitis is a small vessel vasculitis for which the broad differential includes medications, malignancy, connective tissue disorders, and the often-overlooked category of infectious etiologies, including acute viral infections and bacterial infections such as bacteremia and endocarditis. The most common infectious causes include Streptococcal upper respiratory tract infections. Offending antibiotics associated with leukocytoclastic vasculitis are fluoroquinolones, tetracyclines, vancomycin, and beta-lactams.

A rash typically occurs one week after the inciting event and most commonly presents as palpable purpura, though lesions may vary from nodules, vesicles, ulcers, and livedo reticularis. A pathologic diagnosis can be made from a skin biopsy. Treatment of the underlying etiology of leukocytoclastic vasculitis typically leads to resolution of the rash. However, up to 50 percent of cases are idiopathic and are empirically treated with steroids or other immunosuppressive medications. While rare, leukocytoclastic vasculitis is an important skin manifestation of systemic disease and can be a sign of an underlying occult and indolent infection, such as subacute endocarditis. Early diagnosis of the underlying etiology of skin findings can allow for more timely treatment and better patient outcomes.

Presentation #26

Title: The Impact of Cascade Susceptibility Reporting of E. coli and Klebsiella Isolates From Blood and Urine Cultures

Presenter: Julie Sara Alexander

Authors: Julie S. Alexander, DO; Brenton Hall, PharmD; Norman Mang, PharmD; Wenjing Wei, PharmD; Jessica Ortwine, PharmD; Bonnie C. Prokesch, MD

Faculty Mentor: Bonnie C. Prokesc

Abstract

Background: Over 2 million people in the U.S. develop antibiotic-resistant infections annually with 23,000 deaths. The Infectious Diseases Society of America (IDSA) guidelines regarding antimicrobial stewardship describe ways to decrease resistance. One intervention involves cascade reporting of antibiotic susceptibility data by the microbiology laboratory, though this is a weak recommendation based on low-quality evidence.

Methods: We conducted a retrospective study to assess the effect of cascade reporting on prescribing practices and patient outcomes. A cascaded algorithm was executed wherein susceptibility data for piperacillin-tazobactam was suppressed from the susceptibility report if an organism was susceptible to a narrower-spectrum agent. Patients with concurrently positive, monomicrobial blood and urine cultures with non-ESBL E. coli or Klebsiella isolates and receiving empiric piperacillin-tazobactam were included. Data was collected one year before and one year after the cascading protocol was implemented, and included patient demographics, length of stay (LOS), duration of piperacillin-tazobactam, time to de-escalation, and rate of acute kidney injury (AKI) and Clostridioides difficile infection (CDI).

Results: 153 patients (50 pre-intervention & 53 post-intervention) were included. Patients received empiric piperacillin-tazobactam for 46.2 hours before and 44.8 hours after cascade implementation (p=0.8). Both groups had a similar percentage of patients de-escalated (45 (90%) vs. 45 (85%); p=0.56), with similar median times to de-escalation (5.6 hours vs 4.8 hours, p=0.51). The median LOS for patients was 6 days before and 5 days after implementation (p=0.06). In addition, the rates of AKI (3 vs 5, p=0.71) and CDI (1 vs 0, p=0.49) were comparable among both groups.

Conclusion: Although cascade susceptibility reporting is recommended by the IDSA as an antimicrobial stewardship tool, it has weak support due to a paucity of data on the topic. In this study, we found little difference in prescribing practices and no significant difference in LOS or rates of AKI or CDI in both cohorts. As all patients had a urinary source of bacteremia, therapy may have been more likely to be de-escalated rapidly even without cascade susceptibility reporting. Further research is needed to better identify patient populations most impacted by a cascade algorithm and its overall effectiveness as a stewardship tool.

Presentation #27

Title: A Not So Obvious Case of Thiamine Deficiency

Presenter: Kaivalya Deshpande

Authors: Kaivalya Deshpande, MD; John Battaile, MD

Faculty Mentor: John Battaile

Abstract

Case Presentation: Wet beriberi is not a common diagnosis, and often the patient presents with multi-system abnormalities that are distracting individually. This makes it a difficult initial diagnosis, but recognition can result in treatment and resolution of some of the sequelae of thiamine deficiency. A 33-year-old male with a history of HTN, possible seizure disorder, and schizophrenia presented to the ED in a depressed arousal state. Patient arrived via EMS, from prison, due to decreased interaction and refusal to eat for 2 days. Chart review showed that the patient had lost nearly 30 kg since the last time he was seen about 1 year ago. In the ED, he was tachycardic, minimally interactive, and hypertensive. Lactate was elevated and troponin was up-trending with non-STE EKG changes. Cardiac ECHO showed an LVEF of 10%-15% with a small to medium pericardial effusion causing tamponade. LHC showed clean coronaries. Due to his mental status, LP and CT head were done, which were unremarkable. EEG showed moderate degree of a global encephalopathy without clear origin. MRI brain was performed that showed mild diffusion restriction and associated FLAIR signal abnormality involving the bilateral medial thalami, periaqueductal gray, and mamillary bodies. A diagnosis of wet beriberi and Wernicke-Korsakoff syndrome due to thiamine deficiency was finally given.

Patient had already been started on high dose thiamine supplementation before the MRI brain was done. Though the ECHO had showed tamponade effect with small-medium pericardial effusion, the LVEF minimally improved from 10-15% to 28% after 190 cc of sanguineous, culture negative, pericardial fluid was removed. A cardiac MRI was done 11 days into admission and changes were consistent with thiamine deficiency; however, the EF had improved to 50%. Outpatient neuropsychiatric testing confirmed Korsakoff syndrome. Subsequent brain MRI done months later showed slightly decreased but essentially unchanged findings. This case illustrates that thiamine deficiency should be high on the differential in the unassuming patient who presents in a depressed arousal state with any story of starvation. Though brain damage is permanent, cardiac function recovers well with supplementation, which should be started as early as possible, even empirically.

Presentation #28

Title: Growth factor use and rate of neutropenic complications in breast cancer patients treated with dose-dense paclitaxel

Presenter: Kavi Patel

Authors: Kavi Patel, MD; Racha Halawi, MD; Ethan Tobias, MD; Navid Sadeghi, MD

Faculty Mentor: Navid Sadeghi

Abstract

Background: The NCCN guidelines recommend growth factor (G-CSF) support to reduce the risk of febrile neutropenia in patients receiving dose dense chemotherapy. We retrospectively reviewed G-CSF use in patients treated with dose dense paclitaxel (ddT) for breast cancer at our institution.

Methods: Electronic medical records of patients treated at Parkland Health and Hospital System between 2012-2017 for breast cancer with dose dense doxorubicin and cyclophosphamide (ddAC) followed by ddT were reviewed. Data on patient characteristics as well as G-CSF use and neutropenic complications were collected.

Results: Two-hundred sixty eight patients received a total of 1019 cycles of ddT. The majority of ddT cycles were administered without G-CSF support (781 vs 238 cycles). There were no episodes of neutropenic fever in either group. The rate of grade 3/4 neutropenia was 2.1 % with G-CSF support (all grade 3), and 2.7% without G-CSF support (85% grade 3), p = 0.61. Treatment delays were longer in patients who did not receive G-CSF support, but this difference did not achieve statistical significance (mean of 4 vs 2.2 days, p = 0.07). The number of cycles needed to treat to prevent 1 episode of grade 3/4 neutropenia was 167. Based on Medicare average sales price (ASP) for pegfilgrastim, routine use of G-CSF in our patient population would have added over $3.6M to the cost of care over the study period.

Conclusions: Our results show a similarly low rate of neutropenic complications in patients receiving dose dense paclitaxel with or without G-CSF support. This suggests that routine use of G-CSF with this regimen is not warranted which would reduce the cost of care and promote high value care.

Presentation #29

Title: Presence of Incidental Coronary Artery Calcium Prior to Acute Coronary Syndrome: an Opportunity to Improve Prevention

Presenter: Kimberly Berger

Authors: Kimberly Berger, MD ,MPH; Steven Philips, MD; Ari Bennett, MD; Chris Mathew, PharmD; Daniel Bennett, MD; Suhny Abbara, MD; Prabhakar Raijah, MD; Amit Khera, MD; Parag Joshi, MD

Faculty Mentor: Parag Joshi

Abstract

Background: Coronary artery calcium (CAC) is a predictor of coronary artery disease (CAD), acute coronary syndrome (ACS) and cardiovascular mortality. CAC is useful for determining statin eligibility. The purpose of this retrospective cohort study is to evaluate the prevalence of CAC on standard chest CT scans obtained prior to a first ACS event and to evaluate whether the presence of incidental CAC impacted statin prescriptions.

Methods: A retrospective chart review of patients who presented to the cardiac catheterization lab for ACS was conducted at a county safety-net hospital between January 2010 and June 2017. Patients were excluded from this study if they did not have an interpretable non-ECG gated chest CT prior to their ACS presentation or if they carried a diagnosis of CAD at the time of CT. Two trained readers performed ordinal CAC scoring using a validated method (integer scores 0-10). If data were available, the pooled cohort equation was used to calculate ASCVD risk at the time of CT scan. The proportion of patients with statin prescriptions preceding a first ACS event was determined.

Results: We identified 133 patients with an ACS event who had undergone a preceding non-ECG gated chest CT (median time between CT and ACS = 356 days, IQR 82-1204). Inter-rater reliability was satisfactory (κ=0.78). CAC was present in 58% of patients. Ordinal scoring of CAC showed a median value of 1 (IQR 0-4). At the time of ACS, only 51% of patients with incidental CAC (n=77) had an active statin prescription. There was no observed difference in prescription rates between those with and without CAC. For n=78 patients with available data, the median 10-year estimated ASCVD risk was 15.3% at time of CT. Statin use was 39% and 42% among those above and below 7.5% 10-year ASCVD risk.

Conclusion: In this single-center retrospective cohort, a significant proportion of patients with ACS demonstrated evidence of CAC in non-ECG gated chest CT performed prior to their event. These patients were potentially undertreated, and represent a quality improvement opportunity to address cardiovascular risk based on incidentally noted CAC.

Presentation #30

Title: Use of Fresh Frozen Plasma to Correct Coagulopathy in Patients with Variceal Bleeding

Presenter: Komal Patel

Authors: Komal Patel, MD; Ravi Sarode, MD; Deepak Agrawal, MD

Faculty Mentor: Deepak Agrawal

Abstract

Background: Fresh frozen plasma (FFP) is often given to correct elevated prothrombin time (PT)/International normalized ratio (INR) in patients with cirrhosis. Although recent studies have shown that elevated INR does not correlate with risk of bleeding due to rebalanced hemostasis, the guidelines to infuse FFP by different gastroenterology societies are inconsistent, leading to variability in practice. At our institution (862-bed county hospital), most of the requests for FFP are prospectively reviewed by transfusion medicine and discussed with the ordering provider to optimize FFP use. This study was conducted to determine FFP use in patients with variceal bleeding and its effect on rebleeding rates.

Methods: Retrospective review of medical records of patients who underwent endoscopy with banding for variceal bleeds from June 2011 to August 2017. Information collected included - patient demographics, INR, rebleeding, number of units of FFP transfused, and post-transfusion INR.

Results:: 394 EGDs with banding were performed on patients with bleeding varices. Table 1 shows the number of cases in which FFP was given for different presenting INRs. At the time of endoscopy, INR was ≤1.5 in 70.2%, 1.6-2.0 in 22.1%, 2.1-2.5 in 6.1%, and ≥2.6 in 1.6% of patients. FFP was given in 28.7% of patients with an INR >1.5 and was associated with an increased rebleeding rate. Four patients who received FFP experienced rebleeding (12.1%) as compared to 0.0% in those who did not ($p<0.05$). Transfusion of 1-2 units and ≥2 units decreased the INR by a mean of 0.35 (-0.40-1.90) and 0.31 (-0.10-0.60), respectively. In the majority of cases, the INR continued to remain >1.5 at the time of EGD.

Conclusion: FFP transfusions variably decrease INR values. Routine use of FFP in patients with variceal bleeds is unnecessary and may be associated with higher rebleeding rates, possibly due to further increase in portal pressure. At our institution, prospective review of FFP transfusions by transfusion medicine resulted in only approximately onethird of patients with INR >1.5 receiving transfusions.

Presentation #31

Title: Outcomes of Multi-Organ Transplant in Adult Patients with Congenital Heart Disease

Presenter: Kristen Wong

Authors: Kristen Wong, MD; Kristen Tecson, PhD; Ari Cedars, MD

Faculty Mentor: Ari Cedars

Abstract

The prevalence of adult congenital heart disease (ACHD) is increasing in the United States due to improved survival of these patients into adulthood. Their unique physiology commonly leads to multiorgan dysfunction, prompting interest in outcomes after of multi-organ (heart + X) transplantation. We queried the Scientific Registry of Transplant Recipients (SRTR) database to examine 5-year outcomes in ACHD patients (aged ≥ 18 years) who underwent dual organ (heart + kidney/liver/lung) transplantation between 2000 and 2016. Cox proportional hazards models were constructed to look at survival of dual organ recipients versus heart-only recipients in the ACHD population, heart and lung recipients versus heart-only recipients in the ACHD populations, and ACHD versus non-ACHD recipients of heart and lung transplant. We then constructed a multivariable model to investigate independent risk factors for 5-year mortality after heart and lung transplant. Overall, 5-year mortality was greater for multi-organ (heart + kidney/liver/lung) transplant compared to heart-only transplant (hazard ratio = 1.60, 95% confidence interval: 1.10 - 2.34, p = 0.015). On further analysis, heart + kidney (16.4% vs. 0.0%, respectively; p = 0.143) and heart + liver transplants (hazard ratio = 1.59, 95% confidence interval: 0.65 - 3.92, p = 0.310) were not associated with increased mortality while Heart-lung transplant was (hazard ratio = 1.80, 95% confidence interval: 1.20 - 2.69, p = 0.004). Outcomes after heart lung transplant were no different between the ACHD and non-ACHD population. (hazard ratio = 0.94, 95% confidence interval: 0.62 - 1.42, p = 0.77). Risk factors for increased risk of 5-year mortality in ACHD patients after heart lung transplant included prior cardiac surgery (adjusted hazard ratio = 1.83, 95% confidence interval: 1.20 - 2.79, p =0.005) and severe functional limitations (adjusted hazard ratio = 2.03, 95% confidence interval: 1.32 - 3.13, p = 0.001). The mortality risk associated with multi-organ heart transplant in ACHD patients is attributable primarily due to heart-lung transplants, and ACHD does not convey increased risk compared to the non-ACHD population. Need for multiorgan transplant should not be an impediment to listing ACHD patients needing a heart transplant.

Presentation #32

Title: A Case of Life-Threatening Recurrent Hemorrhage Due to Dialysis-Associated Thrombocytopenia

Presenter: Kristina Tzartzeva

Authors: Kristina Tzartzeva, MD; Jeffrey Penfield, MD; Michael Concepcion, MD; Gerard Martins, MD; Peter Van Buren, MD, MSCS; L. Parker Gregg, MD, MSCS; Swati Lederer, MD, MS

Faculty Mentor: Swati Lederer

Abstract

Case Presentation: An 82-year-old man with end-stage renal disease and no prior history of gastrointestinal bleeding (GIB) presented to the emergency room with melena and symptomatic anemia two weeks after hemodialysis (HD) initiation. His hemoglobin was newly depressed to 5.6 g/dL from baseline of 8 g/dL and platelet count was 85 K/µL (baseline of ~120-160 K/µL). Initial esophagogastroduodenoscopy and colonoscopy did not reveal a bleeding source and the patient responded to blood transfusions. Over the next four months, he was admitted four additional times with recurrent GIB. He received a total of 40 units of packed red blood cells, 13 units of platelets, and numerous procedures during that time. Bleeding episodes usually occurred after HD and were associated worsening thrombocytopenia, prompting further workup with pre-HD and post-HD complete blood counts. We observed a 60-80% drop in platelet count after HD with improvement in the platelet count between hemodialysis sessions, raising concern for a dialyzer reaction. His polysulfone (PS), electron-beam sterilized dialyzer was switched to a polyarylethersulfone and polyvinylpyrrolidone, steam sterilized dialyzer, with marked improvement in thrombocytopenia and complete resolution bleeding. The patient stated, "with the first treatment I had, I could tell right then and there that there had been a change in me."

Discussion: To our knowledge, this is the first case of severe, clinically significant thrombocytopenia associated with a PS, electron-beam dialysis membrane. Mild, transient thrombocytopenia, likely due to platelet activation, is a known complication of HD, with an expected 5-15% decline in platelet count within minutes of starting HD and rebound before the end of the session. Newer, more biocompatible dialyzers are associated with less intradialytic thrombocytopenia compared to older cellulosic dialyzers. Both the dialysis membrane material and the sterilization process have been proposed as potential sources of dialysis-associated thrombocytopenia. Further research is needed to better characterize this mechanism and identify predisposing risk factors. Recognition of dialyzer membrane characteristics as a potential culprit for unexplained thrombocytopenia is necessary in caring hemodialysis patients.

Presentation #33

Title: Effect of anacetrapib on ABCA1-specific cholesterol efflux capacity: a substudy of the DEFINE trial

Presenter: Mark Metzinger

Authors: Mark P. Metzinger, MD; Suzanne Saldanha, PhD; Ayea El-Ghazali, MS; Colby Ayers, MS; Anand Rohatgi, MD, MSCS

Faculty Mentor: Anand Rohatgi

Abstract

Background: Impaired reverse cholesterol transport is associated with increased atherosclerosis. Cholesterol efflux from macrophages (CEC) is the initial step of reverse cholesterol transport and is inversely associated with cardiovascular disease (CVD). Anacetrapib is the only cholesterylester transfer protein (CETP) inhibitor that not only raised high density lipoprotein cholesterol (HDL-C) levels but also reduced CVD. However, the effect of anacetrapib on ABCA1-specific CEC among those with CVD is unknown. The objective of this study is to determine the effect of anacetrapib on ABCA1-specific CEC in those with CVD.

Methods: This study included 574 participants randomly selected from the DEFINE trial, a randomized placebo-controlled trial of anacetrapib in participants with coronary heart disease on statin therapy. CEC was measured at baseline and at the 24-week follow up visit using J774 macrophages, BODIPY fluorescent cholesterol, and apolipoprotein B-depleted plasma. CEC was normalized to efflux elicited by pooled human plasma and by Apolipoprotein AI (Apo AI) 100mcg/mL. Multivariable adjusted linear regression analyses were performed to evaluate the independent associations of anacetrapib and lipids on CEC.

Results: Similar to the total DEFINE cohort, anacetrapib was associated with increased HDL-C and Apo AI and reduced Apolipoprotein B (Apo B) and low density lipoprotein cholesterol (LDL-C) compared to the placebo group. In the placebo group, change in CEC was positively associated with increased Apo AI and Apo B but not HDL-C. Anacetrapib was associated with increased CEC at follow up regardless of normalization method after adjustment for baseline CEC, co-variates, and changes in lipids (30% increase).

Conclusions: Among patients with coronary disease, anacetrapib at a dose linked to improved CVD outcomes also significantly increased ABCA1-specific CEC. Increases in CEC are linked more to changes in apolipoprotein levels than cholesterol levels.

Presentation #34

Title: Association of Variability and Change in Hemoglobin A1c and Incident Heart Failure among patients with Type 2 Diabetes Mellitus: Insights from the ACCORD Trial

Presenter: Matthew Segar

Authors: Matthew Segar, MD, MS; Kershaw Patel, MD; Jarett Berry, MD, MS; Ambarish Pandey, MD, MSCS

Faculty Mentor: Ambarish Pandey

Abstract

Background: Heart failure (HF) is one of the most frequent cardiovascular complications experienced by patients with type 2 diabetes mellitus (T2DM). This study aimed to investigate the association between intraindividual fluctuations and changes in hemoglobin A1c (HbA1c) and incident HF among patients with T2DM. **Methods:** We used data from the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, which included patients with T2DM at high cardiovascular risk, in a post hoc analysis to examine the relationship between intraindividual variability and changes in HbA1c and incident HF. The primary outcome of interest was incident hospitalization or death due to HF. Cox proportional hazard models were used to estimate the outcomes for HbA1c variability and change in HbA1c from baseline to year 2 of follow up.

Results: Among 6,833 participants free of baseline HF, 164 (2.4%) developed incident HF during a mean follow up of 4.7 years. The mean baseline HbA1c of the participants was 8.3 +/- 1.0. After adjustment for baseline HbA1c, treatment arm, and traditional risk factors, each 1 SD increase in log-transformed continuous HbA1c variability increased the risk of incident HF 43% (95% CI, 1.17-1.75; P<0.001). Among those participants in the highest quintile of HbA1c variability, the risk of incident HF was 170% higher in the fully adjusted models than patients in the quintile with the lowest variation in HbA1c. Participants who had a gain in HbA1c >10% had a 113% increased risk of incident HF (95% CI, 1.15-3.96; P<0.02). Similarly, participants who had a loss in HbA1c <10% had a 42% increased risk of incident HF (95% CI, 0.95-2.12; P=0.08).

Conclusions: Among patients with T2DM, variability in HbA1c was associated with a higher rate of incident HF independent of baseline HbA1c and traditional risk factors. Additionally, a 'U'-shaped distribution was seen with both high and low changes in HbA1c being associated with increased risk of HF.

Presentation #35

Title: Machine Learning-based Unsupervised Cluster Analysis Identifies Phenogroups with Unique Clinical Characteristics, Outcomes, and Response to Spironolactone: Insights from the TOPCAT Trial

Presenter: Matthew Segar

Authors: Matthew Segar, MD, MS; Kershaw Patel, MD; Mujeeb Basit, MD, MS; Dwuyanne Willett, MD, MS; Jarett Berry, MD; Justin Grodin, MD, MPH; Ambarish Pandey, MD, MSCS

Faculty Mentor: Ambarish Pandey

Abstract

Background: Heart failure with preserved ejection fraction (HFpEF) is a phenotypically diverse clinical syndrome that has proven elusive to medical therapies. Using unsupervised clustering analysis, we aimed to identify distinct phenotypic subgroups and the effect of spironolactone treatment in a highly-dimensional, mixed-data cohort of HFpEF participants.

Methods: The study included 1,767 participants of the TOPCAT trial that were enrolled in the Americas. Using penalized model-based clustering analysis on 66 mixed-data phenotypic variables encompassing demographic, clinical history, laboratory, electrocardiography, and echocardiography data, we characterized three mutually exclusive cohorts of HFpEF participants. Using unadjusted and adjusted Cox proportional hazards models, we further explored the associations between 1) phenogroups and 2) treatment effect of spironolactone to clinical outcomes.

Results: Of the 3,445 participants, 1,678 had incomplete phenotypic data or were located outside of the Americas resulting in 1,767 participants in the present analysis. Phenogroup 1 participants, primarily older Caucasians with fewer comorbidities, had the lowest risk of primary endpoint and HF hospitalization (HR=0.595 [0.43-0.83] and 0.582 [0.40-0.84], respectively) after multivariable adjustment. Spironolactone was also associated with a significantly lower risk of primary composite outcome (HR=0.674 [0.51-0.90]), CV death (HR=0.545 [0.37-0.81]), and HF hospitalization (0.670 [0.47-0.95]) in phenogroup 1.

Conclusions: Machine learning based cluster analysis can identify distinct phenogroups of patients with HFpEF with distinct clinical characteristics, long-term outcomes, and response to spironolactone. These findings highlight the potential utility of deep-phenotyping to better understand, identify, and target specific groups of HFpEF individuals that may respond to more tailored, personalized treatment strategies.

Presentation #36

Title: Strengthening the Foundation of Clinical Reasoning: A Resident Led Initiative

Presenter: Melanie Holtrop

Authors: Stephen G. Philip, MD; Bruno Alvarez Concejo, MD; Melanie Holtrop, MD; Sarah Collins, PhD; Stephanie Brinker, MD; Reeni Abraham MD

Faculty Mentor: Reeni Abraham

Abstract

Background: Deficits in clinical reasoning skills have come into focus as a concern behind high rates of diagnostic medical error. Since the foundation for a physician's diagnostic skill is laid in medical school, we sought to strengthen this by instituting a curriculum taught to medical students by internal medicine residents under faculty supervision.

Methods: During the core internal medicine rotation, students attended a 4 –week course led by a medicine resident. Each week, students analyzed a clinical case. Sessions highlighted the following concepts: illness scripts, problem representations, diagnostic schemas, likelihood ratios, semantic qualifiers, and awareness of bias. Simultaneously, the teaching skills of residents were critiqued by faculty. Students completed a survey about their comfort level with clinical reasoning prior to and after the course.

Results: 1 60 survey responses were received: 105 pre– and 55 post– course. Students had a median 6 months of clinical rotations prior to the concurrent internal medicine clerkship. Before the course, 53% of students felt comfortable or very comfortable altering their diagnosis based on new information, increasing to 80% after the course. Before the course, 60% reported having a clinical reasoning framework, increasing to 96% after the course, the majority using illness scripts (50% pre vs. 69% post). Before the course, 5% of students felt comfortable or very comfortable using likelihood ratios, increasing to 58% after the course.

Conclusions: Our outcomes reflect an increase in students' confidence using key components of clinical reasoning, and a large increase in students reporting the use of a framework. This is significant as failed reasoning and the lack of a standardized approach to clinical problems account for a large percentage of diagnostic error. Our goal is to reinforce a method of reasoning that will be used by students in the future; script concordance data is currently being collected to measure the objective impact of our curriculum. Finally, this study provides evidence that residents can be effective teachers of clinical reasoning to medical students. Since residents provide a large proportion of medical students' clinical training, curricula such as our might have exponential benefits in reducing diagnostic error for any healthcare system.

Presentation #37

Title: Complications of lung biopsies in patients with lung cancer: a population-based analysis

Presenter: Mitchell von Itzstein

Authors: Mitchell S. von Itzstein, MD; Arjun Gupta, MD; Kristin Mara,MS; Sahil Khanna, MD; David E. Gerber, MD

Faculty Mentor: David Gerber

Abstract

Background: The discovery of molecular biomarkers that guide management of lung cancer has led to increasing frequency and amounts of tissue required for lung biopsies. The safety of repeat lung biopsy procedures in patients with lung cancer has only been studied in small cohorts. We analyzed hospital-acquired adverse events in patients with lung cancer undergoing lung biopsies in the National Hospital Discharge Survey (NHDS) database from 2001- 2010.

Methods: NHDS collects information on patients discharged from non-Federal short-stay United States hospitals. Demographics, diagnoses, procedures, and mortality data were extracted using ICD-9 lung cancer diagnosis (162.X) and lung biopsy procedure codes (33.20, 33.24, 33.25, 33.26, 33.27, 33.28). The Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators (PSIs) were utilized to identify hospital-acquired adverse events. Weighted analyses were performed using SAS version 9.4.
Results: 540,747 patients with lung cancer underwent lung biopsy during the study period and were included in the analysis; 61% were >65 years, 46% female, 65% white. Biopsy approaches included bronchoscopic (60%), percutaneous (33%), and surgical (7%). The number of lung biopsies increased over the study period, from 51,221 in 2001, to 63,239 in 2010 (P<0.001). Overall, 159,683 (30%) patients suffered ≥1-PSI event during their hospitalization, including an 11% incidence of pneumothorax. Incidence of PSI varied by biopsy type: bronchoscopic (26%), percutaneous (34%), surgical (39%). The proportion of patients experiencing ≥1 PSI event increased from 24% in 2001, to 38% in 2010 (P<0.001). Patients with ≥1 PSI experienced higher in-hospital mortality (14.5% vs 3.2%, adjusted odds ratio, 5.9, 95% CI 3.9 - 8.9; P<0.001), and prolonged length-of-stay (11.6 vs 8.1 days; P<0.001).

Conclusions: In recent years, the number of lung biopsies performed in lung cancer patients has increased substantially, as has the rate of apparent complications. Although this may in part be due to increasing recognition and coding of clinical events, attempts should be made to prevent these potentially avoidable adverse events. Investigators, sponsors, and regulatory authorities should be aware of the risks associated with repeat biopsies as they design, oversee, and analyze clinical trials. Non-invasive assessment of tumor biology, such as cell-free DNA, may mitigate these risks.

Presentation #38

Title: Dynamic changes in immune markers and metachronous immune-related adverse events with checkpoint inhibitors

Presenter: Mitchell von Itzstein

Authors: Mitchell S. von Itzstein, MD; Shaheen Khan, PhD; Quan Li, MD, PhD; Edward K. Wakeland, PhD; Farjana Fattah, PhD; Rong Lu, David E. Gerber, MD

Faculty Mentor: David Gerber

Abstract

Background: A substantial proportion of patients receiving immune checkpoint inhibitors experience immune-related adverse events (irAEs). These toxicities may affect multiple different organ systems and may occur at almost any point throughout therapy. Currently, there is no means to predict which patients will develop which irAEs or when they will occur. We therefore characterized serum cytokine and autoantibody levels in a patient who developed distinct irAEs separated temporally by 18 months.

Methods: Peripheral blood samples were collected from the patient at therapy initiation, after 2 weeks, after 6 weeks, and then every 12 weeks throughout treatment. Cytokine concentrations were determined using Bio-Plex Pro Human Chemokine 40-plex Panel. Autoantibody levels were determined using an array panel of more than 130 antigens including nuclear, cytosolic, and tissue-specific antigens.

Results: A 53-year-old female with advanced KRAS mutant lung adenocarcinoma was treated with combination ipilimumab and nivolumab therapy. After 4.5 months, the patient presented with orthostasis, fatigue, and reduced serum ACTH and cortisol concentrations. She was diagnosed with hypophysitis and was treated with hydrocortisone, which rapidly improved her symptoms. After 22 months, exposure to cold temperature precipitated painful and swollen fingers with color change to white and then red on rewarming, leading to a diagnosis of Raynaud's phenomenon and treatment with calcium channel blockers. Prior to hypophysitis, there were increases in multiple cytokines associated with T-cell activation, notably CXCL9, CXL10, CCL20 and MIF. Prior to Raynaud's onset, there were dramatic increases in levels of multiple autoantibodies associated with connective-tissue disease including anti-phospholipid, anti-dsDNA, anti-AGTR-1, anti-vitronectin and anti-prothrombin antibodies.

Conclusions: The specific cytokine and antibody spikes over time suggests a landscape of compartmental immune effects. One possibility is that the T-cell cytotoxic immune compartment could dominate initially (manifest by cytokine increases), leading to dysregulation of innate immune tolerance mechanisms and eventual B-cell humoral immune stimulation upon exposure to environmental, self or tumor neoantigen (corresponding to antibody increases). This dynamic immune landscape reveals opportunities for development of diagnostic monitoring with predictive biomarkers and and also reinforces the importance of the close therapeutic relationship and frequent monitoring between oncologists and patients receiving immunotherapy.

Presentation #39

Title: Evaluating the Impact of a Multidisciplinary Gastrointestinal Malignancy Clinic on the Delivery of Care at the Dallas VA Medical Center

Presenter: Namrah Siddiq

Authors: Namrah Siddiq, MD; Monicah Gichinga-Mugwe, MD; Thai Pham, MD; David Wang, MD, PhD

Faculty Mentor: David Wang

Abstract

Background: The outpatient MGMC was established at the Dallas VAMC in 2016. Prior to the MGMC, patients presented to their primary care physicians, who once a malignancy was biopsy confirmed would consult an oncologic specialist. Patients requiring multidisciplinary oncologic care would then have up to three separate appointments (medical, surgical, and radiation oncology) scheduled on separate days. With the creation of the MGMC, however, clinicians from all required oncologic specialties now evaluate a patient in a single clinic on a given day and a definitive therapy course is planned.

Methods: Patients seen in the MGMC were matched to patient controls (seen in the prior 2 years before the MGMC was established) by pathologic diagnosis and stage. The main endpoints were time between the initial oncologic consult and first definitive therapy, time from biopsy to completion of staging and first definitive therapy. The average times for each endpoint for these two groups were then evaluated statistically.

Results: 40 patient cases (with 40 available matched controls) were seen in the MGMC from July 2016-June 2018. A statistically significant reduction in the average time between initial oncologic consult to the time of first definitive therapy was found in favor of patients seen in the MGMC (44.3±20.5 days vs 60.7±41.4 days). The average time from biopsy to first definitive therapy was not found to be significantly different between patient groups. The average time from biopsy to completion of staging was significantly reduced in the MGMC group (31.4±33.1 days vs 53.2±40.5 days).

Conclusions: The establishment of a Multidisciplinary Gastrointestinal Malignancy Clinic allowed cancer patients to meet with various oncology specialists in a single setting and for oncology providers to decide upon an initial consensus treatment plan, resulting in a reduced time between initial consult and first definitive treatment. Staging was also completed more efficiently in patients seen in the multidisciplinary clinic. These results suggest that a multidisciplinary oncology clinic enhances delivery of care in newly diagnosed cancer patients.

Presentation #40

Title: Association of Objectively Measured Sedentary time, Physical activity, and Cardiorespiratory Fitness with Cardiac Structure & Function: Findings from the Dallas Heart Study

Presenter: Neela Thangada

Authors: Neela D. Thangada, MD; Bradley Pieden, MD; Kershaw V. Patel, MD; Vijay Agusala, BS; Julia Kozlitina, PhD; Sonia Garg, MD; Mark H. Drazner, MD; MSc; Colby Ayers, MS; Jarett D. Berry, MD, MS; Ambarish Pandey, MD, MSCS

Faculty Mentor: Ambarish Pandey

Abstract

Background: Physical inactivity and low cardiorespiratory fitness (CRF) are associated with a higher risk of heart failure. However, the independent contributions of objectively measured sedentary time (ST), moderate to vigorous physical activity (MVPA), and CRF toward left ventricular (LV) structure and function are not well established.

Methods: We included 1,368 participants from the Dallas Heart Study (age 49 years; 40% women) free of CVD that had PA and ST measured by accelerometer (Actical) and CRF was estimated from a submaximal treadmill test. ECG-gated tissue-tagged cardiac MRI imaging was performed using 3-T MRI. A series of linear regression models were constructed to evaluate the associations of ST, MVPA, and CRF with LV parameters after adjustment for established CV risk factors.

Results: We observed a modest correlation between objectively measured MVPA levels and CRF levels (Correlation-coefficient [r]: 0.18; $P < 0.001$). In contrast, ST was strongly correlated with MVPA ($r = -0.60$, $P < 0.001$) but not CRF levels ($P = 0.32$). In adjusted analysis accounting for CV risk factors, higher CRF was significantly associated with larger LV, higher stroke volume, better LV contractility (more negative strain), and lower relative wall thickness. The association of CRF with measures of LV structure and function were independent of PA and ST levels. Higher PA levels were also associated with bigger LV size and higher SV volume in the risk factor adjusted models. However, these association were largely related to higher CRF levels and attenuated with further adjustment for CRF. ST was not associated with LV structure and function in either adjusted models.

Conclusions: CRF, but not MVPA or ST, may be an important independent determinant of cardiac structure and function. Future studies are needed to better evaluate CRF as a potentially modifiable target to lower HF risk in the community.

Presentation #41

Title: Temporal Trends in Racial Differences in 30-day Readmission & Mortality Rates for Acute Myocardial Infarction: An Analysis from the NCDR Chest Pain-MI Registry

Presenter: Neil Keshvani

Authors: Ambarish Pandey, MD; Neil Keshvani, MD; Rohan Khera, MD; Di Lu, MS; Muthiah Vaduganathan, MD, Karen E. Joynt Maddox MD, MPH; Sandeep R. Das MD, MPH; Dharam Kumbhani MD, SM, MRCP; Abhinav Goyal MD,MPH; Saket Girotra MD,SM; Paul Chan; Gregg C. Fonarow, MD; Roland Matsouaka, PhD; Tracy Y. Wang, MD, MHS, MSc; James de Lemos, MD

Faculty Mentor: Ambarish Pandey

Abstract

Background: The impact of the Hospital Readmission Reduction Program (HRRP) on racial disparities in readmission rates and mortality rates for myocardial infarction (MI), and whether this varies by hospital performance, is unknown.

Methods: Patients with MI enrolled in the NCDR Chest Pain-MI Registry between 1/1/2008 and 11/30/2014 were linked to Medicare data to obtain post-discharge outcomes. Centers were classified as high- and low-performing based on the difference between actual and predicted readmission rates during the 1st HRRP cycle (October 2012). Adjusted logistic regression models were used to assess the association between race (Black vs. non-Black) and 30-day readmission and 30-day mortality using a difference-in-differences approach.

Results: Among 742 hospitals that treated 169,035 patients with AMI (7.5% black patients), 54% were high-performing. Unadjusted 30-day readmission and mortality rates declined over time in both black and non-black patients. Black (vs. non-black) race was associated with higher unadjusted odds of 30-day readmission in both high- (OR 1.31, 95% CI 1.16- 1.47) and low-performing centers (OR 1.24, 95% 1.13- 1.37) post-HRRP, however, these racial differences were no longer significant after adjustment for patient characteristics. Black race was associated with no significant differences in unadjusted and adjusted 30-day mortality risks in both high- and low-performing centers post-HRRP.

Conclusion: 30-day readmission and mortality rates among patients with MI have declined over time for both black and non-black patients. Implementation of HRRP was not associated with worsening of racial disparities in readmission rates regardless of hospital performance.

Presentation #42

Title: Patient Reported Outcomes Pre and Post Intervention in Older Veterans with Chronic Back Pain

Presenter: Rabih Nayfe

Authors: Rabih Nayfe, MD Matthieu Chansard, Linda S. Hynan, PhD; Eric M. Mortensen, MD; Una E. Makris, MD

Faculty Mentor: Una Makris

Abstract

Background: Chronic back pain (CBP) is the second most common reason for a physician's visit and results in significant physical and psychosocial consequences in older adults. Identifying appropriate and reliable patient reported outcome measures is critical for research and clinical purposes. The NIH's Patient Reported Outcomes Measurement Information System (PROMIS) instruments provide robust patient reported outcome (PRO) measures; however, these have not been evaluated alongside "legacy" instruments in older adults with CBP to expand our understanding of treatment response. In this pilot trial, we used epidural steroid injections (ESI) as a vehicle intervention to better understand our PRO. This study aims to evaluate whether legacy and/or PROMIS biopsychosocial measures change according to those who responded or were non-responders to ESI.

Methods: We enrolled older Veterans (age 60+) with CBP with/without leg pain scheduled for lumbar ESI. Subjects completed "legacy" instruments and corresponding PROMIS computer adaptive test (CAT) item banks pre- and post-ESI in the following domains: pain interference, behavior and intensity; functional status; depression and anxiety; fatigue; sleep and social functioning. The effects of ESI on biopsychosocial measures using legacy and PROMIS were assessed using two-way ANOVA with one repeat factor (pre/post ESI) and one between factor (responder/non-responder). We defined responders vs non-responders to ESI based on the accepted minimally important significant difference for the Roland Morris Disability Questionnaire, used in back pain trials.

Results: Participants included 71 Veterans who were on average 67 years old, 94% men, 73% non-Hispanic white, 17% African American. The time between pre and post ESI assessments ranged between 3-8 weeks (based on routine follow-up appointment). Two-way ANOVA **r**esults showed that ESI responders (compared to non-responders) reported significant improvement in several domains from legacy (pain interference and behavior, depression and fatigue) and PROMIS (fatigue and social) measures.

Conclusion: These results suggest that responders to ESI showed improvement in several domains, more commonly among legacy than PROMIS measures. Fatigue was the only variable that improved using both instruments. Further research in a larger and gender diverse sample is warranted to gain a better understanding of PRO that may improve in older adults with CBP receiving ESI.

Presentation #43

Title: Pseudohyperkalemia in Chronic Lymphocytic Leukemia (CLL)

Presenter: Rula Abdulrahman

Authors: Rula Abdulrahman, MD; Ramesh Saxena, MD

Faculty Mentor: Ramesh Saxena

Abstract

Case Presentation: A 78 year old man with history of CLL, presented to the emergency room (ER) with fatigue. Physical examination was unremarkable. Admission labs showed serum K 8 mmol/L, Creatinine 2.58 mg/dl, uric acid was 6.8 mg/dl. Phosphorus 5.1 mg/dl, WBCs 409.4 x 10(9)/L, Hemoglobin 8.1 g/dl and platelets 18 x 10(9)/L. EKG showed left bundle branch block, and hence, changes related to hyperkalemia could not be assessed. Hyperkalemia was treated in the ED with insulin/glucose, and calcium gluconate. Hyperkalemia persists despite intensive medical management. There was no evidence of tumor lysis syndrome (TLS). On day 2 nephrology consult as K was 8.9 mmol/L. On checking whole blood K by method that does not requires centrifugation (using the iSTAT), the level was found to be 3.1 mmol/L. This confirmed the diagnosis of pseudohyperkalemia.

Discussion: Hyperkalemia is life threatening condition and requires prompt treatment. On the other hand unwarranted treatment can have dire consequences. Pseudohyperkalemia has been observed following prolonged application of tourniquet, repeated fist clenching, traumatic venipuncture, and delayed processing of the sample. This can result in exhaustion of available glucose to generate ATP, which is needed for Na-K pump to maintain the gradient across the cell membrane; results in leakage of potassium out of the cell. Pseudohyperkalemia has been well recognized in association with thrombocytosis and extreme leukocytosis. In rare instances, patients with CLL can develop pseudohyperkalemia due to mechanical disruption of highly fragile leukocytes by centrifugation. Our patient with CLL presented with severe hyperkalemia. He had no apparent cause for persistent severe hyperkalemia, no evidence of TLS and no EKG signs of hyperkalemia. This led to suspicion of pseudohyperkalemia. Measurement of whole blood potassium in uncentrifuged specimen with istat confirmed the diagnosis. In conclusion, in the setting of hyperkalemia in a patient with CLL, whole blood potassium should be measured in uncentrifuged blood speciment using potassium specific electrodes to accurately rule out pseudohyperkalemia prior to instituting treatment.

Presentation #44

Title: An Unexpected finding of Proliferative Glomerulonephritis with Monoclonal Immune Complex Deposits In a Renal Allograft Recipient.

Presenter: Rula Abdulrahman

Authors: Rula Abdulrahman, MD; Mythili Ghanta, MD

Faculty Mentor: Mythili Ghanta

Abstract

Case Presentation: 37 year old Hispanic male with history of ESRD due to congenital hypoplastic kidneys , received living donor kidney transplant from his brother. Patient had stable kidney function for 6 years post transplantation . On routine follow up at 6.5 years post-transplant, he was noted to have nephrotic range proteinuria (6grams/day(and elevation in serum creatinine to 1.7 mg/dl. Immunosuppression regimen at that time consisted of mycophenolate moefetil, prednisone, and tacrolimus. Renal allograft biopsy performed at the time showed "Nodular mesangial glomerulopathy with monoclonal IgG kappa deposits". Concomitant serologic work up revealed no monoclonal protein in the serum with normal Kappa/lambda ratio. Bone marrow biopsy to exclude plasma cell neoplasia was negative. He was treated with pulse corticosteroids with slow taper and maximal renin angiotensin system (RAS) blockade. During subsequent clinic visits, he was noticed to have persistent proteinuria despite increasing RAAS inhibition, when a repeat allograft biopsy was performed, indicating membrano proliferative glomerulonephritis with monoclonal (kappa) deposition, no rejection. At this point diagnosis of PGNID was made and given worsening kidney function and proteinuria decision was made to proceed with 2 doses of IV rituximab1 month apart and pulse corticosteroids. With this therapy at subsequent 6 month follow up, patient was noted to have improvement in proteinuria (from 6 gram/day to 0.7 g/day) with stable allograft function.

Discussion: The term MGRS was introduced to distinguish patients with monoclonal gammopathy that result in the progressive kidney disease who may benefit from B cell /Plasma cell targeted therapy from a renal outcomes perspective. These patients do not meet criteria to be diagnosed with multiple myeloma or B cell lymphoma. Yet inappropriately labelling them as having monoclonal gammopathy of undetermined significance (MGUS) may mislead the clinician to predict a benign course and defer potentially effective therapies that may result in prevention of end stage renal disease. Treatment of MGRS is not yet standardized. Case reports/series suggest use of combination B cell/plasma cell directed therapies including rituximab, bortezomib and cyclophosphamide with variable response rate.

Presentation #45

Title: The Clot Thickens: Pulmonary Embolism as a COPD Exacerbation Trigger

Presenter: Sameh Saleh

Authors: Sameh Saleh, MD; Ishak Mansi, MD

Faculty Mentor: Ishak Mansi

Abstract

Case Presentation: A 71-year old man with severe COPD (GOLD stage 4D) on 3L of O2 and history of unprovoked pulmonary embolisms (PEs) currently on warfarin presented to the emergency room with overnight history of dyspnea on exertion, desaturation with movement, wheezing, and increased sputum production. All five admissions in the past year for COPD exacerbations were thought to be triggered by infection. On exam, he was afebrile, tachycardic to 130 bpm, tachypneic to 25 bpm and saturating 90% on 4L, but desaturated between 80-85% with conversation. Pulmonary exam revealed diffuse wheezing and bronchial breath sounds in the right upper lobe. His white blood cell count was 11 K/μL, creatinine was 0.89 mg/dL and INR was 2.11. His INR 1 week prior was 3.27. On admission, he was continued on oxygen, steroids, bronchodilators, and antibiotics. Chest CT angiography was pursued, which revealed an acute right upper lobe segmental PE; he was then found to have a left popliteal DVT. The patient was eventually transitioned to enoxaparin and given suspected true anticoagulation (AC) failure, the patient was evaluated for causes of thrombophilia and discharged 10 days later after clinical improvement.

Discussion: COPD exacerbations are often reflexively managed. Respiratory infections are often identified as the precipitant and account for nearly 50-70% of cases. However, it is imperative to recognize availability bias and consider alternate precipitants. Pulmonary embolism (PE), which can often have similar symptoms of cough and dyspnea on exertion, is an important trigger in up to 25% of hospitalized COPD exacerbations and can be devastating if missed. A patient like this who is sedentary, has a history of multiple PEs, and presents with hypoxia and significant sinus tachycardia would have high pre-test probability of PE. While the fact that this patient was therapeutically anticoagulated decreases the risk, it certainly does not rule out the possibility of PE as approximately 2% of patients on AC have a recurrence. In those with AC failure, it is then important to consider etiology and distinguish between pseudo-failure due to subtherapeutic AC (i.e. adherence, drug-drug interaction, malabsorption) and true failure from thrombophilic conditions.

Presentation #46

Title: Assessing the Effect of Epicardial Adipose Tissue on the Development of HFpEF

Presenter: Shiva Reddy

Authors: Shiva Reddy, MD; Katrin Dias, PhD; Christopher Hearon, PhD; Michinari Hieda, MD; Satyam Sarma, MD

Faculty Mentor: Satyam Sarma

Abstract

Background: Obesity is a known risk factor for the development of heart failure with preserved ejection fraction (HFpEF). One of the mediators of diastolic dysfunction in obese individuals is the propensity to deposit visceral adipose tissue around the heart, known as epicardial adipose tissue (EAT). It is unknown whether the EAT exerts its effects on cardiac diastolic function by autocrine or paracrine pathways.

Methods: We studied 49 middle-aged (49.8±6.4 years) obese (BMI > 30kg/m2, abdominal visceral fat > 2 kg) but otherwise healthy individuals. All subjects underwent cardiac MRI to measure EAT and a transthoracic echocardiogram to characterize diastolic function. To assess associations between EAT volume and diastolic function, subjects were divided into two groups based on median total EAT volume. EAT was also divided into left and right ventricular depots to determine if there were any paracrine effects of EAT on left ventricular diastolic function. Subjects were divided into left predominant EAT (L/R ratio > 1.0) or right predominant EAT (L/R < 1.0). Analyses were performed using independent t-test.

Results: Subjects with higher total EAT volumes (86.85±20.02 mL) had worse diastolic function than subjects with lower volumes (47.07±12.06 mL) by all parameters (E/e', 9.58±2.02 vs 7.90±2.07, p=0.006; e'lat, 9.5±2.0 cm/s vs 11.6±2.5 cm/s, p=0.002; e'med, 7.1±1.5 cm/s vs 8.9±2.0 cm/s, p< 0.001; E/A ratio, 1.20±0.23 vs 1.42±0.46, p=0.04). Subjects with an EAT L/R ratio > 1.0 (mean ratio 1.21±0.15) did not differ from subjects with a L/R ratio < 1.0 (mean ratio 0.81±0.12) in relation to diastolic parameters (E/e', 9.01±2.63 vs 8.54±1.90, p=0.51; e'lat, 9.9±2.8 cm/s vs 11.0±2.3 cm/s, p=0.18; e'med, 7.7±2.1 cm/s vs 8.9±2.0 cm/s, p=0.34; E/A ratio, 1.26±0.44 vs 1.34±0.33, p=0.52).

Conclusion: In otherwise healthy, obese individuals, total EAT volume is related to diastolic dysfunction. However, the lack of an association between preferential left ventricular EAT deposition and diastolic dysfunction indicates that there is little paracrine effect of EAT. Rather, EAT likely represents an additional depot of fat reflective of general metabolic abnormality.

Presentation #47

Title: Dancing Towards a Diagnosis: A Case of Chorea as the Presenting Feature of Systemic Lupus Erythematosus

Presenter: Shruti Chandramouli

Authors: Shruti Chandramouli, MD; Elizabeth (Blair) Solow, MD

Faculty Mentor: Blair Solow

Abstract

Case Description: A 77-year-old male with history of hypertension and aortic stenosis s/p TAVR on Plavix presented with a two-month history of uncontrollable swinging movements of his right arm and leg, leading to frequent falls. MRI showed enhancement of the right lateral cerebellum with abnormal T2/FLAIR signal. Labs showed positive ANA (1:640), pancytopenia, low C3, positive dsDNA (1:160), and proteinuria. Ceruloplasmin, APLS Abs, and lumbar puncture were negative. He improved significantly with IV solumedrol and was presumptively diagnosed with SLE complicated by autoimmune chorea. He was started on oral prednisone and azathioprine in addition to the dopamine antagonist tetrabenazine; later switched to mycophenolate mofetil. After developing a URI that did not improve with oral steroids and leading to increased fatigue and facial twitching, he was admitted for IV steroids. He developed steroid-induced psychosis, so was given PLEX and then 4 days of IVIG with significant improvement. Since monthly IVIG initiation, he reports improved energy and continues to do well.

Discussion: Chorea is relatively uncommon in neuropsychiatric systemic lupus erythematosus (NPSLE), with prevalence 2-5%, and is one of the earliest disease manifestations. While most cases are reported in young populations, a few cases present in the elderly such as in our patient.

Autoimmune chorea is often associated with anti-phospholipid syndrome antibodies (APLS) and anti-dsDNA. The pathogenesis of autoimmune chorea is thus suggested to either be immune-mediated or related to thrombosis affecting the basal ganglia. MRI brain often shows small hyperintense T2-weighted lesions in subcortical and periventricular white matter of frontal-parietal cerebral regions.

If chorea is inflammatory in etiology, such as in our patient, glucocorticoids alone or with immunosuppressants are routinely used. If symptoms are refractory to initial treatment, plasma exchange (PLEX) and IVIG are considered; our patient got PLEX and is currently managed with routine IVIG infusions. If thrombotic in etiology (due to APLS), anticoagulation is recommended. Dopamine antagonists are often also used.

Chorea is uncommon in lupus and often presents early on in the disease course. By increasing awareness of this rare manifestation, we can perhaps help diagnose SLE earlier to prevent the serious complications that can develop over time.

Presentation #48

Title: Thrombotic microangiopathy [atypical hemolytic uremic syndrome (aHUS)] developing within minutes after renal transplantation and resolving without specific treatment.

Presenter: Stephan Buteau

Authors: Stephan Buteau, MD; Christopher Lu, MD; Mythili Ghanta, MD; Allen Hendricks, MD

Faculty Mentor: Christopher Lu

Abstract

Background: The hallmark of thrombotic microangiopathy (TMA) is severe damage to glomerular endothelial cells eliciting secondary responses that lead to thrombosis and activation of the alternative complement pathway. The mechanism for these secondary responses remains poorly understood. Here we report a patient who developed TMA after renal transplantation within minutes after reperfusion of the allograft. This case report reveals many important features of the pathophysiology of TMA that have not previously been described.

Case Presentation: 33-year-old African American Female received a deceased donor kidney transplant with standard induction and maintenance immunosuppression. Post reperfusion biopsy of the allograft performed intraoperatively showed micro thrombi within glomerular capillaries. Hospital course was complicated by delayed graft function requiring post transplantation dialysis for 2 weeks. Follow up contrast enhanced allograft ultrasound showed evidence of cortical infarct involving 30% of the renal cortex. Repeat allograft biopsy 2 weeks post transplantation showed signs of cortical necrosis within 50% of the glomerular cortex with persistent signs of TMA. Work up for mutations in the complement regulatory proteins revealed a heterozygous missense variant in exon 8 of CFI which has been associated with dysregulated activation of alternate complement pathway. Patient subsequently came off dialysis and serum creatinine stabilized at 3.5 mg/dl at 8 weeks post-transplant.

Discussion: This case highlights several novel important features: 1) TMA developed within minutes after transplant suggestive that the initial injury to glomerular endothelia was ischemia occurring during the transplant surgery. This is the first report that ischemic injury may trigger thrombotic microangiopathy. 2) The disease was not intrinsic to the renal transplant because the contralateral kidney was transplanted into a different recipient who did not develop renal disease. This suggested that a recipient blood molecule(s) contributed to disease. 3) Mutation in complement regulatory gene Factor I was identified, which may have enhanced the patient's susceptibility to TMA. 4) Serial biopsies showed that TMA resolved without treatment with plasmapheresis or complement inhibitors that are sometimes used to treat the condition with known pathologic genetic or acquired abnormalities in complement.

Presentation #49

Title: Measuring Improvement in Clinical Reasoning with Script Concordance Tests

Presenter: Stephen Philip

Authors: Stephen Philip, MD, MS; Bruno Alvarez, MD; Melanie Holtrop, MD; Sarah Collins, MBA, PhD; Caroline Flowers BS; Jerzy Lysikowski, PhD; Stephanie Brinker, MD; Reeni Abraham, MD

Faculty Mentor: Reeni Abraham

Abstract

Background: Faulty clinical reasoning is one of the factors adding cost and morbidity to the US health care system. While teaching clinical reasoning is typically done "on the job" while training on the wards, this experience is not uniform may not be sufficient exposure for the student learner. We sought a new model of teaching by using senior residents as teachers of a weekly case based curriculum to teach clinical reasoning. We used the script concordance test to assess medical students improvement in clinical reasoning.

Methods: We enrolled all 2nd year medical students on their internal medicine clerkship at Parkland Hospital. We then sought experienced senior residents(2nd or 3rd year residents), to teach a 4 week curriculum with faculty oversight, covering probability theory and illness scripts / problem representations using case presentation. Two separate script concordance tests created by residents and were administered to the students before and after the curriculum was completed. The answer key was based on an aggregate score sheet created from 10 medical school faculty mentors. These data were separated by month and analyzed via paired t-test comparing pre test and post test scores.

Results: In session 1, scores improved from 55.2% pre-test to 62.8%($p= 0.022$) in a group of 22 students. In session 2, scores improved from 47.6% to 55.4%($p = 0.004$) in a group of 22 students.

Conclusions: We conclude that senior residents in internal medicine can be effective teachers of clinical reasoning to clinical students on the wards. Furthermore a case-based curriculum which targets improving clinical reasoning may be an effective supplement to on the wards teaching for medical students given the significant improvements in testing data seen in our cohorts.

Presentation #50

Title: Utility of Induction Agents in Simultaneous Liver-Kidney Transplantation

Presenter: Suman Krishna Kotla

Authors: Nashila AbdulRahim, MD; Suman K.Kotla, MD Lee E. Anderson, MD; Hao Liu, MD; Bekir Tanriover, MD, MPH; Venkatesh Kumar Ariyamuthu, MD

Faculty Mentor: Bekir Tanriover

Abstract

Background: The number of simultaneous liver-kidney transplants (SLKT) and utilization of induction therapy in SLKT is on the rise. There is little published evidence of utility of induction agents when contemporary maintenance immunosuppression regimen with tacrolimus, mycophenolic acid, and prednisone (TAC/MPA/PRED) is used.

Methods: We queried the OPTN registry for adult SLKT recipients in the US between 2002-2016. We divided the cohort into three groups based on induction agent: rabbit anti-thymocyte globulin (r-ATG, N=436), interleukin 2 receptor antagonists (IL2-RA, N=1,189) and no-induction (N=1,763) being the reference group. All patients were maintained on TAC/MPA/PRED at the time of discharge. The primary outcomes were post-transplant all-cause mortality and acute rejection rates at 6 months. Survival rates were analyzed using Kaplan-Meier (KM) method and compared between groups using the log rank test. We estimated hazard and odd ratios for our primary outcomes using a propensity score analysis (inverse probability weighting -IPW) adjusted Cox proportional hazard and logistic regression models.

Results: Compared with no-induction, the multivariable IPW adjusted Cox proportional hazard analyses showed an increased mortality with r-ATG (HR=1.31, 95% CI 1.04-1.65, p-value=0.02). At six-months post-transplant, acute rejection rates (both liver and kidney) were less than 10% and were not statistically significant between three induction categories based on multivariable IPW adjusted logistic regression analysis. Mortality secondary to infection was statistically higher in r-ATG group.

Conclusions: In SLKT recipients maintained on TAC/MPA/PRED, induction categories were associated with similar rejection rates at six-months. Compared to no induction, r-ATG appears to increase mortality risk, probably secondary to infections. Benefit of IL2-RA induction in SLKT remains controversial.

Presentation #51

Title: Toll like receptor 4 expression in kidney biopsies with adaptive FSGS

Presenter: Suman Krishna Kotla

Authors: Suman Krishna Kotla, MD; Mythili Ghanta, MD; Allen R. Hendricks. DO; George John, PhD; Hang Nguyen, Jose Torrealba, MD; Christopher Lu, MD

Faculty Mentor: Mythili Ghanta

Abstract

Background: Adaptive focal segmental glomerulosclerosis (FSGS) is characterized histologically by glomerulosclerosis with progressive interstitial fibrosis and tubular atrophy (IFTA). This is an important cause of kidney failure in native as well as transplanted kidneys. Any injury to the native or the transplanted kidney from factors such as chronic reflux, obesity, viral infections, rejection lead to progressive kidney failure which is histologically characterized by adaptive FSGS. Pathogenesis of progressive renal dysfunction in adaptive FSGS remains unclear and hence therapies remain ineffective at present. Toll like receptors (TLR) are innate immune receptors that recognize molecular patterns of tissue injury termed as damage associated molecular proteins (DAMPs). The activation of this pathway leads to recruitment of inflammatory cells to the areas of injury leading to progressive fibrosis. Since adaptive FSGS is initiated by chronic injury we propose that DAMPs released from the injured kidneys lead to TLR activation and activate sterile inflammation and fibrosis leading to progressive disease.

Methods: Retrospective chart review was performed to identify patients with adaptive FSGS and clinical characteristics were obtained. Archived kidney biopsy slides of these cases were stained for TLR4 utilizing immunohistochemistry.

Results: We analyzed expression of TLR4 in the native and transplant kidney biopsies of 8 patients with adaptive FSGS. 3 of the 8 biopsies showed tubular epithelial cell expression of TLR4. Mean Serum Creatinine at the time of biopsy and IFTA scores were higher in the group with TLR4 positive stain compared to the group with negative stain (Serum creatinine 3.7 mg/dl vs 1.16 mg/dl respectively) (IFTA 41% vs 21%) .

Conclusion: This study identifies role of TLR4 activation in adaptive FSGS. Biopsies with advanced renal dysfunction expressed TLR4 and TLR4 expression was absent in biopsies with less severe renal dysfunction. Findings of this study identify novel pathways of pathogenesis which will be verified in a large sample size.

Presentation #52

Title: ANCA-assoicated Aortitis

Presenter: Sunny Lai

Authors: Sunny Lai, MD; Salahuddin Kazi, MD

Faculty Mentor: Salahuddin Kazi

Abstract

Case Presentation: A 31-year-old woman with a history of situs inversus and subclinical hypothyroidism presented with 5 days of non-specific abdominal pain. Her past medical history was otherwise unremarkable and she had no medical complications related to her situs inversus. Her family and social history were not contributory. Her vitals were normal and her physical exam was unremarkable except for her situs inversus. Specifically, her abdomen was soft, non-tender, and non-distended with normoactive bowel sounds and no palpable or pulsatile masses or bruits, and her extremities were warm and well-perfused with 2+ pulses throughout. CT of her abdomen demonstrated circumferential aortic wall thickening from the level of the superior mesenteric artery to the iliac bifurcation with inflammatory fat stranding suggestive of aortitis. This was also demonstrated on CT angiogram of her chest, pelvis, and abdomen, which showed near complete occlusion of her left common iliac artery, high-grade stenosis of the right common iliac artery, and complete occlusion of the origin of the inferior mesenteric artery. There was distal reconstitution of her iliac vessels. A panel of rheumatologic tests was significant for an ANA titer of 1:160 and positive p-ANCA with positive myeloperoxidase antibodies. Vascular surgery was consulted, but, due to the distal reconstitution of her vasculature and the absence of claudication, felt that surgical intervention was not indicated. Her abdominal pain resolved without intervention. She was started on mycophenolate for immunosuppression and is currently following in Rheumatology clinic with no further evidence of complications from her disease.

Discussion: The most common causes of large-vessel vasculitis are Giant Cell Arteritis and Takayasu arteritis. However, the differential diagnosis is broad and includes infection, chronic periaortitis, and several rheumatologic diseases such as systemic lupus erythematosus, rheumatoid arthritis, seronegative spondyloarthropathies, and Behcet syndrome. ANCA-associated vasculitides classically cause disease in small vessels, with renal involvement being the most common manifestation. Descriptions of ANCA-associated vasculitis affecting large vessels such as the aorta are limited to case reports and thus the mechanism of pathogenesis and optimal management are unknown. This case highlights the broad differential for large-vessel vasculitis and demonstrates an unusual manifestation of ANCA-associated vasculitis.

Presentation #53

Title: Undiagnosed Non-classic Congenital Adrenal Hyperplasia - Driving Force For Persistent Hyperandrogenemia in Prostate Cancer

Presenter: Tiwalade Awosanya

Authors: Tiwalade Awosanya, MD; Kevin Courtney, MD, PhD; Kenneth Goldberg, MD; Oksana Hamidi, DO

Faculty Mentor: Oksana Hamidi

Abstract

Case Presentation: An 82 y/o man with prostate adenocarcinoma (Gleason 4+3=7) diagnosed 5 years prior to presentation. On surveillance found to have lymphadenopathy, extra-capsular extension and rising prostate specific antigen (PSA) (from 4.5 to 14.2 ng/ml, n< 4). Stereotactic radiation therapy and androgen deprivation therapy (ADT) with Gonadotropin-releasing hormone (GnRH) analog leuprolide initiated. Post-treatment labs showed inadequate testosterone suppression (total testosterone [TT) 87 ng/dl; target <5.0). Therefore bicalutamide an androgen receptor inhibitor was added with some decline in PSA to 0.29 ng/ml with persistent high TT levels at 88.4 ng/dl. Leuprolide was discontinued. PET/CT revealed skeletal metastases, incidental bilateral adrenal enlargement. PSA increased with persistent TT elevation at 218 ng/dl. ADT was resumed with the GnRH analog degarelix . PSA remained elevated (10.6 ng/dl) with TT partly suppressed (90 ng/dl). Work-up revealed 17-hydroxyprogesterone 4910 ng/dl (n<220), DHEAS 312 mcg/dl (n<166), corticotropic hormone 39 pg/mL (n,7.2-63), cortisol 5.6 mcg/dl (n,5-23), plasma normetanephrine, metanephrine, aldosterone all in range. Adrenal CT showed a 5.6-cm right adrenal and 6.7-cm left adrenal gland. Further history revealed premature puberty, short stature, no children. Based on clinical history and labs was diagnosed with NCCAH due to 21-hydroxylase deficiency resulting in adrenal hyperandrogenemia and inadequate testosterone suppression with progression of prostate cancer despite ADT. He was treated with abiraterone (CYP17A1 inhibitor), prednisone to suppress adrenal androgen production. TT became undetectable (< 5 ng/dl), PSA declined from 12.93 to 0.41 ng/ml.

Discussion: Non-classic CAH is a common autosomal recessive disorder, presents in late childhood as premature pubarche and accelerated bone age. Prevalence of NCCAH is 0.1%-1% among caucasians, even higher among ashkenazi Jews and Hispanics. Treatment in men is generally not required unless there is oligospermia in those desiring fertility. Adrenal hyperandrogenemia can be treated with systemic steroids. Non-classic 21-OHD CAH should be considered in men with prostate cancer with inadequate testosterone suppression after ADT.

Presentation #54

Title: Increasing Rate of Referrals of First-Line Therapies for Chronic Low Back Pain in PRIME Clinic: An Ongoing QI Project

Presenter: Travis Welsh

Authors: Travis Welsh, MD; Una Makris, MD

Faculty Mentor: Una Makris

Abstract

Background: C hronic low back pain (cLBP) is common, and results in significant morbidity and cost. Current evidence-based guidelines recommend non-pharmacologic therapies as first-line since they have minimal adverse effects and have shown to be effective. Current data suggests high rates of pharmacologic therapies and underutilization of first-line non-pharmacologic therapies. This project seeks to ultimately improve the rate of referrals for first-line non-pharmacologic therapies for cLBP in VA PRIME clinic.

Methods: 50 patient charts from June to August 2018 were reviewed by looking at the assessment/plan section of the resident note and the "consults" tab of the electronic medical record (CPRS), looking for documentation of therapies for cLBP, specifically guideline-recommended pharmacologic and non-pharmacologic therapies. With feedback from faculty, residents and the chief informatics officer for the VA, an intervention was designed to increase the rate of documentation for these modalities for cLBP. This intervention is a single-line radio button found in the PRIME clinic note template in the "plan" section of the note. It allows the resident to easily document that the patient has chronic low back pain and provides a list of evidence-based therapies to choose from when clicked.

Results: Over half of the patient charts (60%) documented at least one non-pharmacologic therapy for cLBP. The most common non-pharmacologic intervention documented was exercise therapy, including physical therapy. Only 6% of charts documented use of a psychological-based therapy. Almost all charts (96%) documented use of at least one oral pharmacologic therapy, with over half of the charts (60%) documenting use of at least two agents. A small proportion of charts (8%) documented use of an opioid.

Conclusions: The rate of referrals for first-line, non-pharmacologic therapies for cLBP in PRIME clinic can be improved. To increase rate of referrals for cLBP, a radio button is being implemented that provides an easy-to-use option to direct PRIME clinicians to refer their patients for first-line, non-pharmacologic therapies. Post-intervention, 50 charts will be examined to evaluate the intervention's effectiveness to increase the documentation rate of referrals for non-pharmacologic therapies for cLBP to a stretch goal of 75%.

Presentation #55

Title: Association of the Orthodema Congestion Score and Invasively Measured Hemodynamics in Acute Decompensated Heart Failure

Presenter: Wally A. Omar

Authors: Wally Omar, MD; David Pham, MD; Mark H. Drazner, MD; Jennifer T. Thibodeau, MD; W.H. Wilson Tang, MD; Anuradha Lala, MD; Justin L. Grodin, MD

Faculty Mentor: Justin Grodin

Abstract

Background: The orthodema congestion score (OCS) is a numerical representation of the degree of congestion in patients with acute decompensated heart failure. Observations from prior ADHF cohorts have shown that higher OCS is associated with more frequent adverse clinical outcomes post-hospitalization. The invasive hemodynamic characteristics of OCS, however, have yet to be determined. We sought, therefore, to determine the association of OCS with invasive hemodynamics in patients with ADHF.

Methods: A post-hoc analysis was performed of patients enrolled in the Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE) trial. OCS was a composite score of patient-reported orthopnea, based on required number of pillows, as well as lower extremity edema, graded by degree of pitting in numerical form. Participants were assigned an OCS using the following criteria: orthopnea with ≥2 pillows = 2 points, <2 pillows = 0 points; peripheral edema of 0/1+= 0 points, 2+ =1 point, 3+/4+ = 2 points. OCS were classified by the point total as absent (0), low-grade (1-2), or high-grade (3-4). We tested the association of OCS with right atrial pressure (RAP), mean pulmonary capillary wedge pressure (PCWP), and cardiac index (CI).

Results: In our cohort (n=433, age 56±14 [y], 74% male, 49% ischemic, and LVEF 19±7 [%]) the baseline OCS was absent in 10%, low-grade in 58%, and high-grade in 32%. Hemodynamics were assessed in 215 patients. Higher baseline OCS was associated with higher RAP and PCWP. (p-trend<0.05 for both), but not lower CI (p-trend=0.07). Two-thirds (n= 281) improved their OCS at discharge. In contrast to baseline OCS, higher discharge OCS was associated with fewer days well and alive at 180 days (high-grade v. absent OCS HR 1.38 HR 1.38, 95% CI [0.98-1.96], p=0.07 and HR 1.59, 95% CI [1.04-2.45], p=0.03, respectively).

Conclusion: We found that OCS correlates with invasive hemodynamics such that higher baseline OCS during a heart failure hospitalization is associated with higher RAP and PCWP. Furthermore, higher discharge OCS were associated with fewer days well and alive 6 months after discharge. These findings suggest that OCS may be a useful tool in non-invasive hemodynamic assessments.

4th Annual Donald W. Seldin, M.D. Research Symposium

Presentation #56

Title: Case report of Ornithine Transcarbamylase Deficiency

Presenter: Ahana Sen

Authors: Ahana Sen, MD; William Lee, MD; Markey McNutt, MD, PhD; Nicole Rich, MD

Faculty Mentor: William Lee

Abstract

Case Presentation: 45-year-old female with PMH of gastric sleeve, iron deficiency anemia, endometriosis s/p colonic resection, and biopsy proven hepatocellular carcinoma on Sorafenib who presents with acute episode of confusion and seizures. Patient was found to have severe hyperammonemia to level of 331. Her labs were notable for normal organic acids, with low citrulline level. She was managed with emergent dialysis as well as keppra, lactulose, rifaxamin, and citrulline. She was also started on a low amino acid diet and her Sorafenib was stopped. Her ammoia levels and mentation improved with these interventions. She underwent genetic testing for 14 genes associated with urea cycle defects and reflex testing for another 72 genes associated with secondary hyper-ammonemia all of which were negative.

Discussion: Ornithine transcarbamylase deficiency (OTC deficiency) is the most common urea cycle disorder in humans. Ornithine transcarbamylase is the final enzyme in the proximal portion of the urea cycle. OTC enzyme deficiency leads to decreased production of citrulline, interruption of the urea cycle, increased orotic acid and eventually potentially life threatening hyperammonemia. While this x-linked disease is often most impressive in infant males, in females, presentation can be varied and present at different times and under circumstances of severe stress. Diagnosis of this disease includes plasma and urine amino acid analysis, urine organic acid analysis, and plasma acylcarnithines. Classically individuals display decreased citrulline and arginine, and increased orotic acid. Molecular testing has become preferred method of diagnosis however, this is still challenging given an ever-evolving list of known associated mutation with OTC deficiency in particular and urea cycle defects in general. Treatment goal is to avoid precipitating episodes that can cause increased ammonia concentration such as low protein diet coupled with ammonia lowering agents. Liver transplantation is considered curative for the disease. Urea cycle deficiency should be considered in any patient with severe hyperammonemia and even without confirmation, as relative time with increased ammonia levels can lead to irreversible neurological ramifications. Even without confirmed diagnosis, with high degree of suspicion treatment should be started for presumed OTC deficiency

Presentation #57

Title: Risk of bleeding complications in patients with cirrhosis undergoing transesophageal echocardiography: A systematic review and meta-analysis

Presenter: Ahana Sen

Authors: Ahana Sen, MD; Mobolaji Odewole, MD; Amit G. Singal, MD; Nicole E. Rich, MD

Faculty Mentor: Nicole Rich

Abstract

Background: Transesophageal echocardiography (TEE) is generally considered a low-risk procedure with <1% risk of bleeding complications. Although intraoperative TEE is commonly used for hemodynamic assessment during liver transplantation (LT), the presence of esophageal varices is considered a relative contraindication to TEE by some professional societies. Gastroenterologists are often consulted to perform upper endoscopy prior to TEE to assess esophageal varices in patients with cirrhosis. However, few data exist on the risk of hemorrhage and safety of TEE in this population. Our aim was to perform a systematic review and meta-analysis to quantify the prevalence of bleeding complications in cirrhosis patients following TEE.

Methods: Two reviewers searched MEDLINE and EMBASE databases from January 1992 to January 2019 for studies reporting prevalence of bleeding complications following TEE in patients with cirrhosis. Data was extracted by two authors using standardized forms. The pooled prevalence rate was calculated using the DerSimonian and Laird method for a random-effects model. This study was conducted in accordance with Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) guidelines.

Results: We identified 16 studies meeting inclusion criteria comprising 3,415 unique cirrhosis patients. Nine studies (n = 3,009) assessed risk of intraoperative TEE during LT and seven studies (n = 406) included cirrhosis patients undergoing TEE for other indications. The pooled prevalence of bleeding complications post-TEE was 1.0% (95%CI 0.0% - 2.0%) across all studies. The proportion of patients with bleeding complications was similar among patients undergoing intraoperative TEE during LT compared to those undergoing TEE for other reasons (1.1% vs 2.2%, p = 0.06). Further, bleeding rates were similar among patients in the subgroup of studies with mean MELD > 18 compared to studies with mean MELD <18 (1.9% vs 1.3%, p = 0.31). Data on patient-level factors impacting bleeding complications (including degree of liver dysfunction and coagulopathy) were limited across studies.

Conclusions: In a systematic review and meta-analysis, we found a low prevalence of bleeding complications in cirrhosis patients following TEE, suggesting TEE appears to be safe in this population. Risk stratification with upper endoscopy may not be necessary in all cirrhosis patients prior TEE.

Presentation #58

Title: Repeat fecal occult blood tests for colorectal cancer screening: systematic review and meta-analysis

Presenter: Ahana Sen

Authors: Ahana Sen, MD; Caitlin C. Murphy, PhD, MPH; Bianca M. Sigel; Helen Mayo, MLS; Amit G. Singal, MD, MS

Faculty Mentor: Amit Singal

Abstract

Background: Colorectal cancer (CRC) screening with colonoscopy or stool-based tests, including fecal immunochemical testing (FIT) or fecal occult blood test (FOBT), reduces CRC mortality. For screening to be effective, patients with normal test **Results:** must complete regular stool-based tests every 1-2 years. We conducted a systematic review and meta-analysis to characterize prevalence of repeat FOBT across diverse healthcare settings and populations.

Methods: We searched Medline, PubMed, Embase, and the Cochrane Library for studies published between 1997 and 2017.

Results: Our search strategy identified 6,258 potentially eligible articles; 35 articles representing 27 unique studies met inclusion criteria. Although not uniformly defined, studies measured repeat FOBT as (1) proportion of patients who completed repeat FOBT in two rounds; or (2) proportion of Round 1 participants who completed repeat FOBT in Round 2. Proportion of patients who completed FOBT in two rounds ranged from 16 to 80% pooled prevalence was 46% (95% CI 39-53%). Among those who completed FOBT in Round 1, the proportion completing repeat FOBT in Round 2 also varied widely (25-90%), with a pooled prevalence of 75% (95% CI 64-84%). Repeat FOBT was significantly higher in mailed outreach programs than those offering opportunistic screening. Notably, we identified two pragmatic, randomized trials comparing mailed outreach to opportunistic screening in low-income settings. A higher proportion of patients randomized to mailed outreach completed repeat FOBT in Round 2 (82.2 vs. 37.3%) and across all screening rounds (30.8 vs 2.3%) compared to opportunistic screening. In our assessment of quality, we classified studies as high or medium bias because they did not report the number of patients eligible for repeat FOBT at each screening round (n=14) or describe the type of FOBT (n=8).

Conclusion: We observed a wide range of repeat FOBT across 27 studies, and prevalence generally declined in successive screening rounds. These data show few patients are meticulously up-to-date with screening year after year, which may compromise the effectiveness of CRC screening.

Presentation #59

Title: Racial Differences in Malignant Left Ventricular Hypertrophy and Incidence of Heart Failure: A Multi-Cohort Study

Presenter: Alana Lewis

Authors: Alana Lewi,s MD; Colby Ayer,s MS; Christie Ballantyne, MD; Vijay Nambi, MD; Elizabeth Selvin, PhD, MPH; Chris DeFilippi, MD; Stephen Seliger, MD; Ian Neeland, MD; Mercedes Carnethon, MD; Ambarish Pandey, MD; Tiffany Powell-Wiley, MD; Jarett Barry, MD; James de Lemos, MD

Faculty Mentor: James de Lemos

Abstract

Background: A "malignant" subphenotype of left ventricular hypertrophy (LVH) characterized by elevation in cardiac biomarkers, identifies individuals with LVH at high risk for developing heart failure (HF). We hypothesized that malignant LVH may contribute to racial disparities in HF risk, through higher risk associated with malignant LVH in blacks, higher prevalence in blacks, or a combination of both.

Methods: Participants (n=15, 710) without prevalent cardiovascular disease were pooled from the Atherosclerosis Risk in Communities Study, the Dallas Heart Study and the Multi-Ethnic Study of Atherosclerosis , and classified based on the presence or absence of ECG-LVH and levels of cardiac biomarkers Malignant LVH was defined as ECG-LVH+ and hs-cTnT ≥ 6 ng/L and/or NT-proBNP level ≥ 100 pg/mL. The primary outcome was incident HF.

Results: Over the 10 year follow up period, HF occurred in 512 (3.3%) participants. The prevalence of malignant LVH was 3-fold higher among black men and women vs white men and women. Compared with participants without LVH, the unadjusted hazard ratio for development of HF was 5.1 (95% CI 4.1 to 6.3) for malignant LVH participants and 1.0 (95% CI 0.6 to 1.6) for participants with LVH and negative biomarkers. After multivariable adjustment, the hazard ratio for HF was 2.8 in those with malignant LVH and 0.9 in those with LVH and normal biomarkers. Of black male participants that subsequently developed HF, 30.8% had the malignant LVH phenotype, with a corresponding population attributable fraction (PAF) of 0.21 (95% CI 0.11 to 0.30). The proportion of HF cases occurring among those with malignant LVH, and the corresponding PAF, were intermediate and similar among black women and white men, and lowest among white women

Conclusions: LVH with abnormal hs-cTnT and/or NT-proBNP represents a malignant LVH subphenotype, while LVH in the presence of normal biomarkers appears to be relatively benign with regard to HF risk. A higher prevalence of the malignant LVH subphenotype is seen in black individuals, which may explain some of the excess HF incidence among blacks. Additional study is needed to determine whether targeted screening to identify malignant LVH may reduce racial disparities in HF.

Presentation #60

Title: End of Life Practices in Cystic Fibrosis: Comparing Provider Practices for Pre-Transplant Patients to Patients Who Are Not Transplant Candidates

Presenter: Allison Lange

Authors: Allison Lange, MD; Stephanie Houck, MD; Leah Cohen, MD; Joan Reisch, PhD; Raksha Jain, MD; James D. Finklea, MD

Faculty Mentor: David Finklea

Abstract

Background: Due to the shortened life expectancy and large symptom burden of cystic fibrosis (CF) patients, it is recommended that palliative care (PC) be introduced early into treatment planning discussions with CF patients (Chest, 2004.125(1 Suppl): p.1s-39s). The American College of Cardiology Foundation/American Heart Association guidelines for heart transplant recommend involvement of PC in all patients being evaluated for a heart transplant (J Am Coll Cardiol, 2013. 62(16):p.e147-239), which has been shown to improve patient quality of life (Mayo Clin Proc, 2011.86(6):p.493-500). However, optimal timing of end of life (EOL) discussion in relation to lung transplant (LT) has not been established for CF patients. In this study we aim to describe EOL care practices for CF patients who died of end-stage CF without receiving a LT compared to patients who received a LT.

Methods: We conducted a retrospective chart review for people with CF who died without LT or received LT from 2012-2017. We used chi-square contingency table analysis for categorical variables and Student t-test to compare groups for numerical values. Primary outcomes were 1) EOL discussion with a pulmonologist, 2) time of EOL discussion prior to death or LT, 3) evaluation by PC, and 4) documentation of advanced directive or medical power of attorney (MPOA).

Results: 23 patients died without LT and 40 patients received a LT. Among LT recipients, 10% had EOL conversations compared with 74% of deceased patients ($p<0.0001$). Among deceased patients, 39.1% had EOL conversations greater than 6 months prior to death, while 5% of transplanted patients had EOL conversation greater than 6 months prior to LT ($p<0.001$). Patients without LT were more likely to see PC prior to their death (57% vs. 5%, $p=0.001$).

Conclusions: Patients who received a LT were less likely to have an EOL conversation or receive PC than people with CF who died without LT. Further research should explore when to discuss EOL and best timing to involve PC.

Presentation #61

Title: A novel estimate of creatinine excretion to determine adequacy of 24-hr urine collection

Presenter: Ananya Kondapalli

Authors: Ananya Kondapalli, MD; Beverley Adams-Huet, MS; Naim M. Maalouf, MD

Faculty Mentor: Naim Maalouf

Abstract

Background: 24-hour urine collections are used to assess excretion of various analytes. Concomitant measurement of creatinine excretion adjusted for body weight (BW) determines adequacy of urine collection. We previously showed that current reference ranges for daily creatinine excretion/BW classify a large proportion of contemporary individuals as having performed an "incomplete" urine collection. Furthermore, using 115 pairs of 24-hour urine collections collected in an inpatient research setting, we generated a regression equation that incorporates readily available clinical parameters (sex, race, age, height, and weigh) to predict 24-hour urine creatinine excretion rate. Our objective was to validate this new equation and compare its accuracy with currently established reference ranges in a large outpatient data set to predict urinary creatinine excretion, and hence adequacy of a 24-hour urine collection.

Methods: We analyzed data from participants enrolled in the Kidney Stone Registry at the Center for Mineral Metabolism and Clinical Research at UT Southwestern who completed two consecutive 24-hour urine collections. We excluded results from participants with 24-hour urine creatinine excretion rate differing by >10% between the two collections. We compared the proportion of urine collections falling within the prediction intervals of our new equation with the proportion falling within the currently used reference range (15-20 mg Cr/kg BW for females and 20-25 mg Cr/kg BW for males).

Results: We reviewed 1399 pairs of 24-hr urine collections collected in an outpatient setting from 504 female and 895 male participants. The new prediction interval performed significantly better than the currently used reference range. In women, actual creatinine excretion was within the predicted range in 90.5% of cases using the new interval and 46.12% using the current reference range. The corresponding values were 90.0% and 32.6% in men. In both genders, the superiority of the new prediction over the current reference range was more pronounced at higher BMI.

Conlusions: Our proposed equation that incorporates readily available parameters to predict urine creatinine excretion performs substantially significantly better than the currently established reference range.

Presentation #62

Title: Trends in Medicare Reimbursements for Antihyperglycemic Therapies in Diabetes Mellitus Management Between 2012 and 2016

Presenter: Andrew Sumarsono

Authors: Andrew Sumarsono, MD; Brendan M. Everett, MD, MPH; Darren K. McGuire, MD, MHSc; Javed Butler, MD, MPH; Ambarish Pandey, MD; Muthiah Vaduganathan, MD, MPH

Faculty Mentor: Ambarish Pandey

Abstract

Background: The global cost of diabetes mellitus (DM) care is rising rapidly. While the price of insulin has been recently scrutinized, the relative distribution of costs of DM care across therapeutic classes needs to be re-examined. The aim of this project is to evaluate the US trends in reimbursements for DM therapies among Medicare Part D beneficiaries from 2012 to 2016.

Methods: We performed a retrospective cost-analysis of 10 classes of antihyperglycemic therapies prescribed to Medicare Part D beneficiaries between 2012 and 2016 using the Medicare Part D Prescription Drug Event dataset, which contains pharmaceutical spending for patients enrolled in Medicare Part D. Combination therapies were excluded. Trends in total spending, per-beneficiary spending, and annual percent change in spending across classes of antihyperglycemic therapies between 2012 and 2016.

Results: Medicare Part D spent $19 billion on DM therapies in 2016, up from $8 billion in 2012 (a 137% increase). In 2016, analog insulins were the costliest insulin therapy accounting for $11.2 billion, while dipeptidyl peptidase-4 inhibitors were the costliest non-insulin therapy ($3.4 billion). Between 2012 and 2016, total analog insulin expenditures increased by 167%, while human insulin increased by 86%. Longitudinal increases in spending were also observed for sodium-glucose co-transporter-2 inhibitors (128%), glucagon-like peptide-1 receptor agonists (78%), and dipeptidyl peptidase-4 inhibitors (58%). Overall spending related to thiazolidines decreased significantly (-92%), driven by fewer beneficiaries and decreased per-beneficiary spending.

Conclusion: While insulin expenditures continue to increase rapidly, spending related to newer non-insulin DM therapies has also increased at a similar pace. Appropriateness of use, quality of care, and therapeutic value need to be re-examined in light of these rising therapeutic costs of DM care.

Presentation #63

Title: Economic Burden Associated with Extended-release vs. Immediate-release Formulations of Cardiometabolic Medications Among Medicare Beneficiaries

Presenter: Andrew Sumarsono

Authors: Andrew Sumarsono, MD; Nathan Sumarsono, BS; Sandeep R. Das, MD, MPH, MBA; Muthiah Vaduganathan, MD, MPH; Deepak Agarwal, MD; Ambarish Pandey, MD

Faculty Mentor: Ambarish Pandey

Abstract

Background: The United States spends more on medications than any other nation in the world. The cost-savings of switching extended-release (ER) medications to their immediate-release (IR) counterparts has not been studied. The aim of this study is to estimate potential Medicare Part D savings if patients on brand name ER neurologic drugs were switched to generic IR neurologic formulations.

Methods: The Medicare Part D Prescription Drug Event dataset is publicly available and accounts for medication expenditures of Medicare patients enrolled in Part D.The dataset contains 2,832 medications. Two team members independently identified drugs with ER formulations. We included only oral medications with ER and generic IR formulations. We excluded medications with fewer than 500 beneficiaries. We performed a literature review of the identified ER formulations and excluded all medications with strong evidence of therapeutic or side effect superiority. We estimated cost savings by multiplying the difference in average ER and IR spending per beneficiary with the number of beneficiaries receiving the ER formulations. We evaluated the relative proportions of ER beneficiaries by dividing ER beneficiaries with the sum of IR and ER beneficiaries. Similar calculations were performed to identify relative proportion of ER spending

Results: Of the 69 drugs with ER formulations, 33 drugs with 74 formulations were included. Medicare part D spent a $3.7 billion on ER drugs for 6 million beneficiaries, an average of $616 per person. In contrast, Medicare Part D spent $2 billion for 21.2 million beneficiaries, an average $95 per person. Of the medications listed in our study, ER formulations represented only 28% of all prescriptions, but accounted for 65% of total spending. We estimate switching from ER to IR formulations would have resulted in $2.9 billion in 2016 and $11.9 billion between 2012-2016.

Conclusions: All medications listed in this study offer improved ease of use without added therapeutic benefits. By switching patients on ER formulations to generic IR, an estimated $2.9 billion could have been saved in 2016. Despite these findings, a patient-centered approach should be used to determine if convenience or cost-savings is more important to each individual patient.

Presentation #64

Title: Genetic causes of low LDL-C from patients referred to specialty lipid clinics

Presenter: Brandon Robert Jakubowski

Authors: Brandon Jakubowski, MD; Zahid Ahmad, MD

Faculty Mentor: Zahid Ahmad

Abstract

Background: Hypocholesterolemia is characterized by low-density lipoprotein-cholesterol (LDL-C) levels in the bottom 5th percentile of the population and is usually identified in healthy adults as an incidental finding upon routine cholesterol screening. These individuals are often referred to specialty lipid clinics where they are evaluated for secondary causes (eg. chronic inflammatory states, thyroid disorders, malabsorption). However, primary monogenic causes - including mutations in microsomal triglyceride transfer protein (MTTP), proprotein convertase subtilisin/kexin type 9 (PCSK9), apolipoprotein B (APOB), and angiopoietin-like 3 (ANGPTL3) - are underrecognized and genetic screening was not widely available until recently.

Methods: We recruited hypocholesterolemia patients from specialty lipid clinics. DNA was sent for whole exome sequencing in 7 patients in whom no identifiable secondary cause was established.

Results: Patients ranged in age from 25 to 63 years, and LDL-C levels ranged from undetectable to 18 mg/dL. Triglycerides were low or normal in all patients (range 19-72 mg/dL), and HDL-C was normal for nearly all patients (range 29-81 mg/dL). Though most patients had no significant medical issues, the 63 year old patient was found to have hepatic steatosis and intermittent diarrhea of unknown etiology. Exome sequencing revealed 4 patients had heterozygous frameshift mutations in APOB (p.Val952fs, p.Gly3617fs, p.Leu719fs, p.Gly3617fs), one patient had a heterozygous stop-gain APOB mutation (Glu137*), one had a heterozygous stop-gain PCSK9 mutation (p.Cys679*; of note this patient also had a heterozygous p.Asn425Ser PCSK9 mutation), and one had a heterozygous APOB splice site mutation. The patient with p.Gly3617fs APOB mutation also had homozygous missense mutations in ANGTPL3 (p.Leu127Phe).

Conclusions: Among primary hypocholesterolemia patients recruited from specialty lipid clinics, we identified the underlying genetic cause in all of them. Based on our case series, mutations within the APOB gene appear to be the most common cause of hypocholesterolemia. Our study is unique in its focus on adult patients recruited from a clinical setting, as most prior studies have occurred in the pediatric setting or in population-based cohorts. Future work will help confirm our findings in larger patient cohorts and establish more phenotype-genotype relationships for patients with hypocholesterolemia.

Presentation #65

Title: Subarachnoid hemorrhage and rhabdomyolysis: understanding critical electrolyte derangements.

Presenter: Bruno Alvarez Concejo

Authors: Bruno Alvarez Concejo, MD; Kalamanathan Sambandam, MD

Faculty Mentor: Kalamanathan Sambandam

Abstract

Case Presentation: Intracranial emergencies are associated with potentially catastrophic electrolyte derangements. We present the case of a 32-year-old male admitted to the Intensive Care Unit (ICU) following a subarachnoid hemorrhage. An arteriogram showed near complete thrombosis of a ruptured left P2-3 junction posterior cerebral aneurysm and no intervention was pursued. Elevated intracranial pressure was managed with mannitol and hypertonic saline, resulting in marked polyuria. Severe hypokalemia and hypophosphatemia followed, with a nadir of 1 and 0.4 mEq/L respectively, despite 775 mEq of potassium chloride and 100 mEq of potassium phosphate over 48 h. The course was complicated by septic shock secondary to ventilator-associated pneumonia, requiring norepinephrine. Multifactorial acute kidney injury (AKI) ensued, reaching AKI Network Stage III. Rhabdomyolysis developed, with a peak creatine kinase of 329820 IU/L. Rebound hyperkalemia followed, with the serum potassium rising from 2.1 to 9 mEq/L over 48h. Continuous renal replacement therapy failed to control the hyperkalemia and intermittent hemodialysis was required. He recovered urine output around day 27th, was transferred out of the ICU on day 30th and discharged to a rehabilitation facility on day 38th. Deferred aneurysm intervention was successful. At present, the patient's only sequela is a minor visual deficit. Serum creatinine is now 1 mg/dL, and potassium homeostasis is normal.

Discussion: Multiple factors played a role in this clinical course. Initial hypokalemia was driven by intracellular shifts (due to the hyperadrenergic state associated with intracranial emergencies, catecholamine use and bronchodilation) and total potassium depletion (osmotic diuresis). Rhabdomyolysis was due to hypokalemia-induced regional muscular ischemia and hypophosphatemia-induced adenosine triphosphate depletion. Rebound hyperkalemia resulted from intracellular potassium release in conjunction with AKI. This pattern of hypokalemia followed by hyperkalemia is sometimes seen in patients with intracranial emergencies. Barbiturate use and hypothermia can contribute to the same pattern of serum potassium fluctuation. Consequences are often fatal, and it is paramount that clinicians anticipate this pattern to intervene in a skilled and timely manner.

Presentation #66

Title: Rapidly Progressive Interstitial Lung Disease in anti-MDA5 Related Clinically Amyopathic Dermatomyositis

Presenter: Carlos P Cardenas

Authors: Carlos P Cardenas, MD; Surbhi Gupta, MD; aehyun Kim, MD; Corey Kershaw, MD; Andrew Tomlinson, MD; Ben Galloway, MD

Faculty Mentor: Andrew Tomlinson

Abstract

Case Presentation: Clinically amyopathic dermatomyositis (CADM) is diagnosed when biopsy-confirmed lesions of dermatomyositis are present for at least six months in the absence of muscle weakness or elevated muscle enzymes. Antibodies to melanoma differentiation-associated protein 5 (MDA5) have been associated with CADM with rapidly progressive ILD and a poor prognosis. Here, we report a case of anti-MDA5 related CADM presenting with rapidly progressive ILD. A 61-year-old woman of Korean descent presented to the hospital with progressive shortness of breath and cough. Three months prior to this admission she developed painful lesions on the pulps of her fingertips and violaceous papules on the extensor surfaces of her elbows and the dorsum of her hands. Biopsy of the papules was consistent with Gottron's papules, and CADM was diagnosed. Two months prior to admission she developed progressive dyspnea on exertion and a non-productive cough. She was started on mycophenolate mofetil, prednisone, and trimethoprim/sulfamethoxazole without improvement. On admission, she was in respiratory distress with a respiratory rate of 36 and oxygen saturation of 90% on 90% HFNC at 40 LPM. Exam was notable for the previously described rash and diffuse inspiratory crackles with intermittent squeaks. She was intubated for severe hypoxemic respiratory failure on hospital day two. Autoimmune serologies revealed a positive ANA at 1:320 dilution (diffuse pattern), positive SSA Ro52, and positive anti-MDA5 antibody. Muscle enzymes were within normal limits and inflammatory markers were elevated. CT chest showed diffuse peribronchovascular ground glass opacities with inter- and intralobular septal thickening in a "crazy-paving" pattern. Bronchoscopy was performed, and infectious studies were negative. She was started on antibiotics, pulse dose steroids, IVIG, and tacrolimus without improvement. She died two weeks after intubation.

Our patient developed rapidly progressive respiratory failure in the setting of recently diagnosed CADM with positive anti-MDA5 antibodies. Anti-MDA5 antibodies are highly associated with the development of ILD, and most of the cases are rapidly progressive. Pathology typically shows diffuse alveolar damage, and mortality within six months is between 40-80% despite treatment. More studies are needed to determine optimal management; however, a combination of prednisone, cyclophosphamide, and a calcineurin inhibitor is often used.

Presentation #67

Title: Hemorrhagic Shock due to Ruptured Hepatocellular Carcinoma

Presenter: Carlos P Cardenas

Authors: Cardenas Carlos, MD; Femnou-Mbuntum Laurette, MD; Ruggiero Rosechelle, MD

Faculty Mentor: Rosechelle Ruggiero

Abstract

Introduction: Hepatocellular carcinoma is a frequent complication of cirrhosis. The most common HCC-related causes of death are progression of HCC, liver failure, and ruptured HCC. Ruptured HCC is a devastating complication and is often misdiagnosed due to nonspecific signs and symptoms. We present a case of ruptured HCC diagnosed by paracentesis in a patient initially misdiagnosed with septic shock.

Case Presentation: A 60 year-old man with hepatitis C and alcoholic cirrhosis presented to the emergency department with a two day history of abrupt onset, diffuse abdominal pain. He was afebrile, tachycardic, hypotensive, and tachypneic with a normal oxygen saturation. Exam of the patient revealed somnolence, asterixis, dry mucous membranes, pale conjunctiva, poor capillary refill, and a distended abdomen with diffuse tenderness and dullness to percussion. Labs revealed a hemoglobin of 7.1 (baseline 12.0), transaminitis, coagulopathy, hyperammonemia, and severe lactic acidosis. The MICU was consulted for septic shock due to presumed spontaneous bacterial peritonitis; however, due to acute anemia and shock, ruptured HCC with hemoperitoneum was added to the differential. Paracentesis performed at bedside revealed grossly bloody fluid with 800,000 red blood cells and a hematocrit of 14%. CT scan of the abdomen revealed a large HCC with evidence of active extravasation of blood and large volume hemoperitoneum. Embolization of the hepatic artery was performed by interventional radiology with stabilization of bleeding. Paracentesis was repeated multiple times due to abdominal compartment syndrome. Unfortunately, the patient died from multiorgan failure during his hospitalization.

Discussion: Since the abdominal cavity can hold over 5 liters of blood, ruptured HCC can lead to rapid development of hemorrhagic shock and death. Catheter embolization is the initial therapy of choice followed by surgical intervention if bleeding remains uncontrolled. With a reported mortality of 70%, ruptured HCC should always be on the differential for new abdominal pain, hypotension, or falling hematocrit in a patient with known HCC or with risk factors for HCC. Our patient required repeated paracentesis to control intraabdominal pressures, although it ultimately did not change the patient's outcome.

Presentation #68

Title: Profiling the Discordant Visceral Adipose Tissue - Ectopic Liver Fat Phenotype: **Results:** from the Dallas Heart Study

Presenter: Cody McCoy

Authors: Cody McCoy, MD; Colby Ayers, MS; Ian J. Neeland, MD

Faculty Mentor: Ian J. Neeland

Abstract

Background: The accumulation of visceral adipose tissue (VAT) and ectopic liver fat (ELF) generally parallel each other, but a proportion of individuals have discordant fat deposition. The cardiometabolic profile of individuals with a discordant phenotype is unknown.

Methods: Among participants in the multiethnic Dallas Heart Study cohort, we examined the cross-sectional associations of VAT-ELF phenotypes with circulating biomarkers of insulin resistance, dyslipidemia, inflammation, and subclinical atherosclerosis. VAT and ELF were assessed by magnetic resonance imaging and magnetic resonance spectroscopy, respectively. Participants were stratified into phenotype groups: low VAT-low ELF, low VAT-high ELF, high VAT-low ELF, and high VAT-high ELF defined by median sex- and race-specific values for VAT and ELF. Associations between phenotype groups and biomarkers were adjusted for age, sex, race, menopausal status (women only), and body mass index (referent low VAT-low ELF).

Results: In multivariable models, high VAT-low ELF was significantly associated with insulin resistance (HOMA-IR), lower adiponectin concentration, higher LDL cholesterol and more small, dense LDL particles, lower HDL cholesterol and less large HDL particles, higher high sensitivity C-reactive protein and myeloperoxidase levels, increased aortic wall thickness, and higher odds of hypertension, diabetes, and the metabolic syndrome (Table). Low VAT-high ELF was showed similar patterns except that there was no independent association with aortic atherosclerosis, myeloperoxidase, or LDL cholesterol and low VAT-high ELF was associated with higher adiponectin (Table).
Conclusions: High VAT-low ELF is associated with an adverse atherosclerotic, dyslipidemic, dysmetabolic and inflammatory phenotype whereas the profile of low VAT-high ELF is more variable. These findings suggest phenotypic heterogeneity of abdominal and liver fat distribution with markers of cardiometabolic risk and provide insight into the biological roles of VAT and liver fat in cardiometabolic disease.

Presentation #69

Title: NAD+ Repletion Reverses HFpEF by Attenuating Myocardial Metabolic Dysfunction

Presenter: Dan Tong

Authors: Dan Tong, MD, PhD; Gabriele G. Schiattarella, MD, PhD; Nan Jiang, MSc; Francisco Altamirano, PhD; Luke I. Szweda, PhD; Thomas G. Gillette, PhD; Joseph A. Hill, MD, PhD

Faculty Mentor: Joseph A. Hill

Abstract

Background: Heart failure with preserved ejection fraction (HFpEF) is a highly prevalent clinical condition associated with significant morbidity, mortality and health care expenses. Yet, no effective treatment has been identified. We recently demonstrated that concomitant metabolic and hypertensive stress in mice elicited by a combination of high fat diet (HFD) and constitutive nitric oxide synthase inhibition by N[w]-nitro-l-arginine methyl ester (L-NAME) recapitulates the numerous and myriad features of human HFpEF (paper in press at Nature).

Methods: Wild type C57Bl6 mice were fed with HFD and L-NAME via drinking water for 5-8 weeks. Myocardial mitochondrial morphology was assessed by electron microscopy. Mitochondrial function was assessed by measuring oxygen consumption rates using an oxygen electrode. Protein expression and modification were assessed by Western blotting and immunoprecipitation.

Results: Using this novel mouse model, we discovered significant impairment of mitochondrial fatty acid oxidation (FAO) associated with hyperacetylation of key FAO enzymes in HFpEF myocardium. Mechanistically, downregulation of Sirtuin3, the major mitochondrial deacetylase, and deficiency of its co-substrate nicotinamide adenine dinucleotide (NAD+), culminated in mitochondrial protein hyperacetylation. Strikingly, supplementation with nicotinamide riboside (NR), a NAD+ precursor, led to dramatic improvement of mitochondrial function, and importantly, amelioration of the HFpEF phenotype.

Conclusion: In summary, we have unveiled that protein hyperacetylation-mediated mitochondrial dysfunction is a crucial mechanism of HFpEF pathogenesis. This is, to our knowledge, the first study identifying a specific signature of metabolic remodeling in HFpEF heart. We also demonstrated the therapeutic effect of NAD+ repletion in a preclinical HFpEF model. In next steps, confirming this benefit in a clinical trial is warranted.

Presentation #70

Title: HFpEF-associated atrial fibrillation: Impaired AMPK signaling

Presenter: Dan Tong

Authors: Dan Tong, MD, PhD; Gabriele G. Schiattarella, MD, PhD; Nan Jiang, MSc; Thomas G. Gillette, PhD; Joseph A. Hill MD, PhD

Faculty Mentor: Joseph A. Hill

Abstract

Background: Patients with heart failure with preserved ejection fraction (HFpEF) are uniquely predisposed to atrial fibrillation (AF), which significantly worsens clinical outcomes. Little is known about the molecular characteristics and mechanisms underlying HFpEF-associated AF, and no effective treatments have been identified. We recently demonstrated that concomitant metabolic and hypertensive stress in mice elicited by a combination of high fat diet (HFD) and constitutive nitric oxide synthase inhibition by N[w]-nitro-l-arginine methyl ester (L-NAME) faithfully recapitulates the numerous and myriad features of human HFpEF (paper in press at Nature), thus providing an invaluable tool to study mechanisms underlying HFpEF-associated AF.

Methods:: Wild type C57Bl6 mice were fed with HFD and L-NAME via drinking water for 5-8 weeks. AF was induced by transesophageal pacing. Protein expression was assessed by Western blotting and immunohistochemistry.

Results:: We observed that HFpEF mice are highly susceptible to pacing-induced AF, as compared with control groups. We discovered that left atrial (LA) hypertrophy associated with activation of mTORC1 (mechanistic target of rapamycin complex), and aberrant electrical signal conduction secondary to reduced and heterogeneous atrial gap junction protein connexin40 (Cx40) expression are key pathological features. In contrast with other AF models, no significant atrial fibrosis was observed, suggesting unique features and mechanisms. Of note, similar changes were observed in atrial samples obtained from HFpEF patients. We unveiled that AMPK (adenosine monophosphate-activated protein kinase) signaling, a key regulator of cellular metabolism and an element critical to normal atrial function, is impaired in the atria of these mice as well as in HFpEF patients. In cultured atrial myocytes, silencing AMPK led to myocyte hypertrophy and impaired Cx40 expression, whereas AMPK activators attenuated those changes. More importantly, our preliminary data suggested that metformin, an AMPK activator used extensively in clinical practice, significantly reduced AF susceptibility in HFpEF mice.

Conclusion: Our results reveal a novel molecular mechanism of HFpEF-associated atrial remodeling, and a crucial role of AMPK signaling in the AF preponderance in HFpEF. We also demonstrated the potential therapeutic effect of metformin in HFpEF-associated AF, pointing to prospects of early clinical translation.

Presentation #71

Title: Colon Cancer Screening Improvement in the UTSW GIM clinic

Presenter: David Bennett Grinsfelder

Authors: David Bennett Grinsfelder, MD, MPH; John Clark III, MD, PhD; Mary McGarry, MD; Margaret McLean, MSN, APRN, ACNS-BC; Bethany Agusala, MD; Ethan Halm, MD, MPH

Faculty Mentor: John Clark, III

Abstract

Background: Colorectal cancer is the third leading cause of cancer-related deaths in among men and women in the United States and is expected to cause over 50 thousand deaths in 2018 (ACS). Overall, not counting skin cancer, colorectal cancer is the third leading cancer diagnosis in the U.S. with a 4-5% chance of lifetime diagnosis for both men and women. According to CDC, 25% of Americans between the ages of 50 and 75 have never been screened and 85% of the unscreened have insurance. Lean Six Sigma is a synergism of manufacturing ideologies that combines Lean waste reduction strategies and Six Sigma strategies for reducing variability and manufacturing errors.

Methods: This project utilized Lean Six Sigma methodology to assess and improve the current screening levels at the UTSW GIM clinic. In order to determine the number of active patients at UTSW GIM clinic that are not up to date on their colorectal cancer screening, EPIC data pulls werer filtered for active patients (patients that have seen their GIM PCP in clinic in the last 3 years). The patient list was then further stratified by age, and history of colon cancer. These stratifications were performed by mining EPIC via the Health Maintenance tool to identify patients with a care gap. These two groups were then examined by demographics, PCP, and timing of appointments.

Results: The data was analyzed for statistically significant differences between the patients with a care gap and those without. The only significant differences were in the patient's appointment trends. Those patients with a care gap have lower percentage of appointments scheduled in the next 6 months (37.4 vs. 26.5) and a higher percentage with care gaps had no follow-up appointments (36.4 vs. 44.5). Finally, there was significant discrepancy from between providers in their rates of patients with care gaps.

Conclusion: In order to address the differences between patients with care gaps and those without and other trends in the data, interventions were designed to schedule appointments for patients with care gaps, educate providers on colon cancer screening an the use of the Health Maintenance function in EPIC.

Presentation #72

Title: Authorship gender in the production of anecdotal clinical evidence

Presenter: David Hsieh

Authors: David Hsieh, MD; Magdalena Espinoza, MD

Faculty Mentor: Magdalena Espinoza

Abstract

Background: Publications are critical for professional development and the advancement of clinical knowledge. Whether female authorship disparities exist in non-research publications of clinical information is unknown. Case reports are a poorly understood component of the biomedical corpus despite their historical importance and wide accessibility, and the production of such anecdotal observations is not confounded by factors that may lead to disparities in female representation in research publications. Our objective was to examine the authorship of case reports and elucidate determinants of gender disparity.

Methods: Cross-sectional study of all case reports published by US authors in 2014 and 2015 indexed in PubMed.

Results: Author demographics and bibliometric data were abstracted for 20,427 case reports published across 2,538 journals. State level case report production was closely associated with trainee numbers (R2=0.92). 36% and 25% of case reports had a female first and last author, respectively. In comparison, 46% and 34% of US trainees and physicians, respectively, were female in 2016. Female first and last authors in adult case reports were more prevalent in academic environments compared to community settings. Across states, the proportion of female first authors was universally less than the proportion of female trainees across states and the proportion of female last authors was nearly always less than the proportion of active female physicians. Female first authorship was associated with larger author teams (OR 1.02), an academic affiliation (OR 1.16), and a female last author (OR 1.58). Relative to general internal medicine, specialties dominated by male providers were less frequently associated with female first authors. Several specialties were exceptions in displaying gender neutral authorship including oncology, ophthalmology, optometry, and radiation oncology.

Conclusions: The underrepresentation of females among first and last authors in non-research publications of clinical information underscores the pervasiveness of female disparities in medicine, especially in interactions that lead to authorship. Collaboration and female mentors may be critical instruments in upsetting longstanding practices that are associated with gender bias. Not all clinical specialties were associated with lower than expected female authorship, and further exploration of specialty specific norms in publication, and mentorship may elucidate specific barriers to female authorship.

Presentation #73

Title: A Purrfect Diagnosis: Solving a Case of FUO by Physical Examination

Presenter: Elisa Pichlinski

Authors: Elisa Pichlinski ,MD; Ali Rueschhoff, MD; Jesse Jaso, MD; Amneris Luque, MD; Maeghan Gibson, MD

Faculty Mentor: Maeghan Gibson

Abstract

Case Presentation: 53-year-old man presents with fever for four weeks. Has a history of well-controlled Human Immunodeficiency Infection (HIV) with two previous evaluations for fever Both times he was discharged after extensive, unrevealing infectious work-up. With current presentation, he also reports diarrhea, nausea, diffuse, symmetrical arthralgias/myalgias, and productive cough for 2 days. He aslo lost 10 pounds since onset of fever. Social history notable for employment as a nurse at the county jail, frequent travel to Mexico and South America, recent dental procedure and history of intravenous drug use. Lives with 3 dogs, 2 cats, and is monogamous with his husband. Vitals notable for fever to 38.4 Celsius and tachycardia. Physical exam reveals faint, dry crackles in lung bases, 1 centimeter tender, right inguinal lymph node and small scratches over extremities without surrounding erythema. Laboratory evaluation significant for mildly elevated liver enzymes, positive Hepatitis C antibodies with negative viral load, positive RPR with negative TPPA and normal white blood cell count. CT chest with bibasilar atelectatic changes, subcentimeter mediastinal lymph nodes. CT abdomen/pelvis showed circumferential wall thickening and enhancement in rectum, several enlarged mesorectal lymph nodes.

A right inguinal lymph node biopsy is performed revealing "stellate-shaped" granuloma with necrosis, serology for Bartonella revealed IgM positivity, and a diagnosis of Cat Scratch Disease is made.

Discussion: Fever of unknown origin is a common encounter for internists and three general categories of illness account for the majority of FUO cases: infections, malignancies, and systemic rheumatic diseases. In this patient, the initial differential was broad and included infectious and non-infectious causes. After a complete and thorough history and physical examination, we were able to narrow our differential to lymphoma, tuberculosis and CSD. The diagnosis of cat-scratch disease does not usually necessitate biopsy, but given this patient's numerous exposures and risk factors, an excisional lymph node biopsy was the most effective and safe way to make a final diagnosis, while ruling out non-infectious causes. This case highlights the importance of history taking and physical examination in FUO and provides further evidence that CSD should be considered in the differential and initial evaluation of FUO.

Presentation #74

Title: An Electronic Pre-Participation Questionnaire for Athletes

Presenter: Gary Parizher

Authors: Gary Parizher, MD; John D. Putzke, PhD, MSPH; Benjamin D. Levine, MD, FACC, FAHA, FACSM

Faculty Mentor: Benjamin D. Levine

Abstract

Background: Multiple guidelines recommend pre-participation evaluation (PPE) for athletes to evaluate for the risk of sudden cardiac death. Despite the ubiquitous use of mobile electronic technology, most symptom questionnaires used for PPE are paper-based, with blunt and easily misinterpreted questions. These drawbacks impair the screening process. We aimed to standardize the PPE, enhance athletes' understanding of survey items, and create a multimedia-enhanced web-based PPE platform.

Methods: We consolidated all items of current guideline-recommended screening questionnaires. We specifically selected four easily misinterpreted survey items that are critical for the clinical assessment of patients with cardiovascular disease: chest pain, palpitations, syncope, and dyspnea. We drafted scripts in which actors/actresses demonstrate each selected symptom. We presented the consolidated questionnaire and video scripts to experts for revisions. Once all experts agreed on survey and video content, a video production company filmed and produced the video clips. A web-based research software developer created the online survey incorporating the videos.

Results: Our online questionnaire contains two sections: one for personal symptom history and one for family history of heart disease. The personal history items investigating chest pain, palpitations, syncope, and dyspnea each have a 20- to 25-second video clip with an actor/actress demonstrating the symptom.

Conclusions: With expert consensus we created an electronic PPE with video comprehension aids. We hope to incorporate it into standard screening practice. The use of the electronic PPE could constitute a powerful research platform investigating heart disease in young athletes. Validation efforts are underway.

Presentation #75

Title: Coronary Artery Calcification, but not Aortic Pulse Wave Velocity, Predicts Cardiovascular Events, Mortality, and Kidney Dysfunction

Presenter: Geoffrey Huntley

Authors: Geoffrey Huntley, MD; L. Parker Gregg, MD, MSCS; Julia Kozlitina, PhD; James de Lemos, MD; S. Susan Hedayati MD, MHSc

Faculty Mentor: Susan Hedayati

Abstract

Background: Aortic arch pulse wave velocity (PWV), a marker of medial arterial stiffness, and coronary artery calcification (CAC), a marker of coronary atherosclerosis, are elevated in chronic kidney disease (CKD). In CKD patients, PWV predicts CKD progression to dialysis dependence. We investigated whether CAC and PWV can be used to predict development of earlier CKD as measured by incident albuminuria and decline in eGFR, when interventions targeting these measures may improve long-term outcomes.

Methods: We conducted a prospective, community-based cohort study of Dallas Heart Study participants who underwent aortic arch PWV and CAC measurement. Estimated glomerular filtration rate (eGFR) was calculated from serum creatinine measured at baseline and after 7 years of follow-up. Kidney outcomes were defined as the composite of incident CKD (defined by albuminuria or eGFR <60 mL/min/1.73 m2) or a decrease in eGFR >2.5 mL/min/1.73 m2 per year. A priori outcomes were cardiovascular (CV) events (myocardial infarction, stroke, coronary revascularization, and CV death) and death at a median follow-up of 13 years. Associations of baseline CAC and PWV with kidney outcomes were assessed using logistic regression, and associations with CV outcomes and death were measured using Cox Proportional Hazards regression.

Results: A total of 2,062 participants had a mean age 45±9.3 years, 56% were female, 47% were African American, 10% had diabetes mellitus, and 7% had CKD at baseline. There were 187 kidney events, 177 CV events, and 165 deaths. Log transformed CAC taken continuously was associated with composite kidney events, aOR (95% CI), 1.16 (1.06, 1.27), CV events, aHR (95% CI) 1.38 (1.27, 1.51), and death, aHR (95% CI) 1.19 (1.10, 1.29). CAC ≥100 Agatston units was associated with CV events, aHR (95% CI), 2.21 (1.49, 3.28) and death, aHR (95% CI) 2.30 (1.57, 3.37), but not kidney events. PWV taken continuously or in tertiles was not associated with kidney outcomes, CV events, or death.

Conclusion: CAC, but not PWV, was independently associated with CKD incidence and progression, CV events, and death. These results suggest that CAC may be a useful tool to predict clinically meaningful kidney outcomes in addition to CV events and death.

Presentation #76

Title: Cardiac Denial and Clinical Expectations Associated with Depression in Adults with Congenital Heart Disease

Presenter: Geoffrey Huntley

Authors: Geoffrey D. Huntley, MD; Kristen M. Tecson, PhD; Sandeep Sodhi, MD; Joshua Saef, MD; Kamila S. White, PhD; Philip A. Ludbrook, MD; Ari M. Cedars, MD; Jong Mi Ko, MA

Faculty Mentor: Ari M. Cedars

Abstract

Background: Depression in adults with congenital heart disease (ACHD) is highly prevalent and strongly associated with adverse prognosis. Better management of risk factors for depression may improve clinical outcomes in this population.

Methods: We conducted a single-site, cross-sectional study of 78 ACHD followed at Washington University School of Medicine. Data considered in the analyses included retrospectively obtained clinical information and patients' self-assessed psychosocial functioning and health status. To identify the clinical and psychosocial variables associated with depression, we built a stepwise multivariate model to measure the relative contribution of these variables to depression status

Results: The prevalence of depression in our sample was 26%. Our model accounted for approximately 67% of the variability in depression scores. The final model consisted of the Cardiac Denial of Impact Scale, expectations domain of Barriers to Care, and the energy and social domains of the Rand 36-Item Short Form Health Survey. Clinical variables did not predict variability in depression scores.

Conclusions: In conclusion, greater cardiac denial and negative expectations of the healthcare team were associated with increased depression symptoms in ACHD. Interventions focused on decreasing cardiac denial and improving patient satisfaction with healthcare may improve depression status in ACHD.

Presentation #77

Title: Outcomes of End Stage Liver Disease Ward Patients Requiring ICU Transfer In A Safety Net Hospital

Presenter: Giuliana Cerro

Authors: Giuliana Cerro, MD, Andrew Sumarsono, MD, Thomas Tielleman, MD, Larry Brown, Catherine Chen, MD, Matthew Leveno, MD

Faculty Mentor: Matthew Leveno

Abstract

Backgrond: End Stage Liver Disease (ESLD) is the 12th most common cause of death in the United States and the second most common among digestive diseases. Literature reports on ESLD patients requiring ICU admission describe hospital/ICU mortality between 28 and 87%. In addition to the overtly severe presentation of massive GI bleeding and septic shock, more subtle insults may also trigger a clinical trajectory ultimately requiring ICU care. While early recognition and intervention is the cornerstone of critical care for all patients, the poor outcomes of ESLD patients that experience MOF suggests the need for heightened vigilance. In an effort to describe the clinical trajectories of ESLD patients admitted to our MICU, we performed a retrospective cohort analysis of 384 ESLD patients admitted over the course of two years.

Methods: We conducted a retrospective analysis of all patients with ESLD admitted to the MICU at a large academic public hospital from March 2015 to March 2017. The Diagnosis of cirrhosis was confirmed by laboratory variables, imaging, and pathology when available. We obtained demographic information, etiology of cirrhosis, and reason for admission. Severity of illness was determined using APACHE IV scores. Outcomes measured include ICU and hospital LOS as well as ICU and hospital mortality.

Results and Discussion: During this period, 384 patients with ESLD were admitted to the ICU, of these 27% were transferred from the ward. Mortality was significantly higher in patients with cirrhosis compared to those without cirrhosis. ESLD patients that require ICU care following initial admission to the ward have significantly higher mortality rates than those admitted directly to the ICU from the ED. However, the mortality difference is attributable to the outcomes experienced by patients that are transferred later in the hospital admission. Patients requiring ICU transfer within the first 3 days of admission to the ward do not have a statistically significant increase in mortality compared to those admitted to the ICU directly form the ED. This finding suggests that the higher mortality rate in ICU transfer patients may not be preventable by lowering the threshold to ICU admission at presentation to hospital.

Presentation #78

Title: Standing Blood Pressure Measurements Can Identify Pseudo-Intradialytic Hypertension

Presenter: Han-Cheng Chen

Authors: Han-Cheng Chen, MD; L. Parker Gregg, MD, MSCS; Swati Lederer, MD; Jeff Penfield, MD; Michael Concepcion, MD; Peter Van Buren, MD, MSCS

Faculty Mentor: Peter Van Buren

Abstract

Background: In hemodialysis patients, intradialytic hypertension (IH) is an increase in blood pressure from pre- to post-dialysis that is associated with increased extracellular volume (ECV) and mortality. Because all the literature on IH is based on seated blood pressure measurements, we investigated whether standing blood pressure measurements could distinguish isolated blood pressure increases from clinically significant IH in an individual treatment.

Methods: In a retrospective cohort of hypertensive hemodialysis patients, we identified individuals with IH, defined as an increase in seated blood pressure from pre- to post-dialysis in a single treatment. We separated these participants into two groups: those with true IH, defined as increases in standing systolic blood pressure from pre- to post-dialysis, and pseudo-IH, a decrease in standing systolic blood pressure from pre- to post-dialysis. We measured the change in total peripheral resistance index (TPRI) from pre- to post-dialysis and post-dialysis ECV normalized to body weight using bioimpedance spectroscopy.

Results: Among 25 participants with IH, 7 (28%) had pseudo-IH and 18 (72%) had true IH. Over the prior 6 months, the pseudo-IH group and true IH group experienced IH in 20% and 40% of their treatments, respectively. In the single treatment that we collected physiologic data, the seated pre- and post-HD systolic blood pressures were 146±14 and 167±12 mmHg in the pseudo-IH group and 137±14 and 155±18 mmHg in the true IH group, with a change in SBP of 22±15 vs. 17±14 mmHg, p=0.5. The ratio of ECV/body weight was 0.23±0.04 in the pseudo-IH group and 0.27±0.04 in the true IH group, p=0.04. The intradialytic change in TPRI was -491±470 dynes·sec/cm5 in the pseudo-IH group and 577±840 dynes·sec/cm5 in the true IH group, p=0.0006.

Conclusions: Participants with true IH had higher ECV than those with pseudo-IH. True IH was also associated with intradialytic TPRI increases, compared to decreases in those with pseudo-IH. Clinically significant IH can be difficult to identify using blood pressure measurements from individual treatments due to intradialytic and interdialytic blood pressure variability. However, pre- and post-dialysis standing blood pressure measurements can help distinguish sporadic increases in seated blood pressure from clinically significant IH.

Presentation #79

Title: No increased rates of adverse IBD-related outcomes for patients with IBD and concomitant prostate cancer treated with radiation therapy

Presenter: Jaehyun Kim

Authors: Jaehyun Kim, MD; Linda Feagins, MD; Anchalia Chandrakumaran, MD; Cassandra Gandle, MD; Katrina Naik, MD; Jasoun Hou, MD; Michael Yao, MD; Jill Gaidos, MD

Faculty Mentor: Linda A. Feagins

Abstract

Background: Patients with inflammatory bowel disease (IBD) may be at higher risk for complications from radiation treatment for prostate cancer. However, available data are limited, and controversy remains regarding the best treatment approach for patients with IBD who develop prostate cancer. We aimed to compare IBD-related outcomes for patients with concomitant IBD and prostate cancer depending on the treatment modality received for their prostate cancer

Methods: Retrospective cohort study across 4 VA hospital systems (VA North Texas Healthcare System, Dallas, TX; Michael E. DeBakey VA Medical Center, Houston, TX; Washington DC VA Medical Center; McGuire VA Medical Center, Richmond, VA) Patients with established IBD who were diagnosed and treated for prostate cancer between 1996 - 2015 were included. We assessed for: a) flares of IBD within 6, 12 and 24 months of cancer diagnosis b) BD-related hospitalizations within 6, 12 and 24 months of cancer diagnosis c) IBD-related surgeries within 6, 12 and 24 months of cancer diagnosis d) survival at 1, 2 and 5 years post-cancer diagnosis

Results: No baseline differences in prostate cancer staging between cohorts treated with and without radiation treatment. No difference in IBD-related outcomes was found between patients with IBD treated with or without radiation for their prostate cancer including: a) no difference in rates of flares at 6,12, and 24 months, b) no difference in rates of hospitalizations at 6,12, and 24 months, c) no differences in rates of surgery at 6, 12, 24 months. No difference in overall survival at 1, 2 or 5 years was found between patients with IBD treated with or without radiation for their prostate cancer

Conclusions: These data support that avoidance of radiation therapy in IBD patients with prostate cancer is not necessary. Confirmation with larger, randomized studies is recommended.

Presentation #80

Title: Impact of dual anti-HER2 therapy on pathologic complete response rate in breast cancer in a minority-enriched population.

Presenter: Jenny Jing Li

Authors: Jenny J. Li, MD; Hsiao C. Li, MD; Ang Gao, Samira K. Syed, MD: Nisha Unni, MD; Navid Sadeghi, MD

Faculty Mentor: Navid Sadeghi

Abstract

Background: The addition of pertuzumab (P) to a neoadjuvant trastuzumab (H) plus chemotherapy combination has been shown to significantly improve the pathologic complete response rate (pCR) in localized HER2+ breast cancer; however, minorities have been under-represented in these trials. Racial/ethnic disparities have also been shown to affect outcomes of cancer treatment. This study is aimed to assess the impact of neoadjuvant dual HER2-blockade in an unselected minority-enriched population.

Methods: A retrospective chart review was conducted of women with stage I to III HER2+ breast cancer who received neoadjuvant treatment between 2007 and 2017 at an academic institution and its affiliated safety net health system. Data on stage, chemotherapy, race/ethnicity, site of therapy (academic vs safety net hospital), and hormone receptor status were collected. All patients underwent surgery after completion of neoadjuvant chemotherapy. pCR was defined as ypT0/is, ypN0. Chi-squared test and univariate/multivariate logistic regression were used for statistical analysis.

Results: The study population included 261 women with the following race/ethnic distribution: 37.7% Non-Hispanic Whites, 34.6% Hispanics, 20.6% Blacks, and 7% other racial/ethnic origin. Ninety-five patients (36%) received chemotherapy-H vs 166 patients (64%) received chemotherapy-HP. Patients at the safety net health system had higher stage at diagnosis compared to the academic site. Site of care and race/ethnicity did not impact the choice of neoadjuvant treatment. The pCR rate was significantly higher for the chemotherapy-HP group (55.4%) compared to the chemotherapy-H group (34.7%) ($p = 0.001$). There was no association between race/ethnicity, or site of treatment (academic vs safety net), and the probability of achieving pCR. Multivariate analysis showed only dual anti-HER2 therapy (OR: 2.67, CI: 1.55-4.59, $p = 0.0004$) and hormone-receptor negative status (OR: 2.18, CI: 1.30-3.67, $p = 0.0031$) to correlate with pCR.

Conclusions: Neoadjuvant dual anti-HER2 therapy was more likely to result in a pCR in our minority enriched population. Our data also suggests the combination of chemotherapy-HP confers similar benefit irrespective of race/ethnicity or site of care.

Presentation #81

Title: A Case of Diffuse Pain

Presenter: Jiexin Wang

Authors: Jiexin Wang,MD; Shan Luong, MD

Faculty Mentor: Shan Luong

Abstract

Case Presentation: A 45-year-old woman with chronic cocaine abuse presented with 3 days of pain in her lower back, bilateral hands, arms and legs. Routine urinalysis showed moderate blood and 1 RBC per HPF. Creatine kinase (CK) was checked and elevated at 7,691 units/L. Patient's rhabdomyolysis was initially thought to be secondary to cocaine abuse. She was given intravenous fluids but pain persisted and CK trend did not improve. On physical examination, patient was noted to have bilateral proximal muscle weakness with skin thickening and edema of both hands. Upon further questioning, patient endorsed a 30-pound weight loss over the past month due to reduced oral intake. On speech evaluation, patient was found to have oropharyngeal dysphagia. Later on, patient complained of mild dyspnea and an initial chest X-ray was normal. High-resolution CT chest was done that showed diffuse pulmonary reticular infiltrates consistent with interstitial lung disease. Autoimmune workup was pursued, with positive ANA (titer of 1:1280) and positive anti-Ro/anti-La. MRI of extremities was performed that showed nonspecific muscular edema suggestive of inflammatory myositis. Patient underwent right tibialis anterior muscle biopsy that showed "pauci-inflammation necrotizing myopathy, but no specific features of dermatomyositis, polymyositis or inclusion body myositis". Patient's overall presentation did not fit with one discrete rheumatic disease, but suggested a diagnosis of overlap syndrome (scleroderma-polymyositis/dermatomyositis). She was initiated on oral prednisone 60mg daily. Four weeks later, patient reported symptomatic improvement on her follow-up appointment at the rheumatology clinic.

Discussion: Patients with multisystem complaints often pose a diagnostic challenge. This case illustrates the value of diagnostic parsimony which emphasizes the aim to find a single unifying diagnosis that explains a given patient's symptoms, especially when multiple systems are involved. It is also key to recognize that as much as 25 percent of patients with systemic symptoms of rheumatic diseases cannot be definitively diagnosed. They either do not satisfy the diagnostic criteria of a single entity or display overlapping manifestations of multiple entities. Finally, preconceptions related to patients' gender, ethnicity or social history (drug abuse as the cause of rhabdomyolysis in this case) may potentially hinder the disclosure of true diagnosis.

Presentation #82

Title: Not Just Diabetes and Hypertension: A Crystal Clear Case of Acute Kidney Injury

Presenter: Justin Holmes

Authors: Justin Holmes, MD; Suman Kotla, MD; Nilum Rajora, MD

Faculty Mentor: Nilum Rajora

Abstract

Case Description: A 44-year-old woman with past medical history notable for heart failure with preserved ejection fraction, type 2 diabetes, hypertension, and obesity presented with a diabetic foot ulcer. Surgical history included Roux-en-Y gastric bypass three years earlier with chronic post-operative diarrhea. The patient's baseline creatinine was 3.9 mg/dl which had progressed to 7.19 mg/dl on admission. She had no recent NSAID use. Ultrasound of kidneys showed no acute pathology. Urinalysis revealed 100 protein and 6 WBCs on microscopy with no casts, and protein-to-creatinine ratio was 1.5 mg/mg. Autoimmune work-up and viral hepatitis serologies were negative. Given the rapidity of decline in renal function, the patient underwent ultrasound-guided kidney biopsy which demonstrated oxalate nephropathy superimposed on a background of nodular diabetic glomerulosclerosis and severe hyaline arteriolosclerosis. Eventually, the patient ended up on hemodialysis with this acute kidney injury.

Discussion: Oxalate nephropathy is increasingly recognized as a complication of malabsorptive diarrhea in the setting of Roux-en-Y gastric bypass. In such a case, the malabsorbed fat is saponified, consuming intestinal calcium and increasing the amount of free oxalate available for absorption. Free fatty acids and bile salts may also increase colonic permeability to oxalate and further contribute to systemic absorption. Additional risk factors for oxalate nephropathy include excess vitamin C supplementation (which is metabolized to oxalate) and thiamine or pyridoxine deficiencies. Oxalate nephropathy is a devastating condition that presents as worsening renal function, with the majority of patients eventually requiring dialysis. Proteinuria is common, but hematuria or urinary crystals are seen in a minority of cases. Recognizing oxalate nephropathy allows implementation of interventions to treat enteric hyperoxaluria and slow the progression of kidney disease. For instance, adherence to an oxalate-restricted diet reduces enteric absorption of oxalate. Our case draws attention to the risk of oxalate nephropathy related to Roux-en-Y gastric bypass and highlights that this risk persists even years after surgery. Our case further cautions against premature diagnostic closure in ascribing renal disease exclusively to hypertension and diabetes.

Presentation #83

Title: Inflammatory Marker, GlycA, Outperforms hsCRP in Predicting Cardiovascular Events

Presenter: Kayla Riggs

Authors: Kayla Riggs, MD; Colby Ayers, MS; Anand Rohatgi, MD

Faculty Mentor: Anand Rohatgi

Abstract

Background: High-sensitivity C-reactive protein, a marker of inflammation and predictor of cardiovascular events, sparked interest in the relationship between inflammation and cardiovascular disease (CVD). A novel marker of inflammation, GlycA, an integrated glycosylation protein of five acute phase reactants, has been shown to be associated with incident cardiovascular events. We assessed the hypothesis that GlycA is a superior risk prediction marker than hsCRP for cardiovascular events.

Methods: Baseline measurements of GlycA and hsCRP were obtained from the Dallas Heart Study, a multi-ethnic cohort of 2520 adults. GlycA was derived from NMR spectral features. The primary endpoint was ASCVD (N=262) or composite CVD (N=309). CV risk factors included age, sex, race, diabetes, systolic blood pressure, hypertension medication, smoking, BMI, total and HDL cholesterol, and hx of CVD. Risk prediction indices included calibration, category-less net reclassification index (NRI) and integrated discrimination improvement (IDI).

Results: In cox proportional hazards models adjusted for cardiovascular risk factors, GlycA was directly associated with ASCVD (HR for Q4 vs. Q1: 1.86, 95% CI 1.22 to 2.81) whereas hsCRP was not (HR for Q4 vs. Q1: 1.19, 95% CI 0.82 to 1.74). Similar results were seen in composite CVD (HR for GlycA Q4 vs. Q1: 1.99, 95% CI 1.36 to 2.91). hsCRP did not attenuate these associations in models including both hsCRP and GlycA. Models that included GlycA quartiles were well calibrated (p=NS for ASCVD and composite CVD). Adding GlycA to traditional CV risk factors improved the NRI for composite CVD (0.30, 95% CI 0.04 to 0.56; p=0.02) but not for ASCVD (NRI 0.15, 95% CI -0.07 to 0.36 p=0.18). The IDI for models including GlycA was significant for both ASCVD and composite CVD (p<=0.005 for both ASCVD and composite CVD). Models including hsCRP did not significantly improve the NRI or IDI.

Conclusions: GlycA as a novel marker of inflammation is superior to hsCRP with respect to association and prediction of incident CV events. Further studies are warranted to validate these findings among those with and without CVD and to test integrating GlycA into CVD prediction models.

Presentation #84

Title: Determining Patient and Provider Acceptance of Therapeutic Drug Monitoring to Improve Medication Adherence

Presenter: Kevin Schesing

Authors: Kevin Schesing, MD; Shishir Sharma, MD; Hamza Lodhi, MD; Bryan Wu, MD; Sandeep R. Das, MD; Bryan Elwood, Scott A. Smith, PhD; Ethan A. Halm, MD; Wanpen Vongpatanasin, MD

Faculty Mentor: Wanpen Vongpatanasin

Abstract

Background: Therapeutic drug monitoring (TDM) is a method used in the assessment of medication adherence by determination of a drug or its metabolites in blood or urine samples. TDM-guided feedback has been shown to improve medication adherence and subsequent blood pressure (BP) control in patients with resistant hypertension. Herein, we sought to evaluate the attitudes of patients with uncontrolled hypertension as well as their providers towards incorporating TDM to assist clinicians with adherence assessment and hypertension management.

Methods: We conducted a qualitative study consisting of in-depth, cognitive interviews in 10 patients seen in Parkland General Cardiology and Internal Medicine Clinics with uncontrolled hypertension, (average clinic BP of ≥130/80 mmHg while on at least 2 antihypertensive medications). The patients were asked a series of 9 standardized questions to elicit their attitudes towards TDM use in the management of hypertension after informed consent. In addition, 10 providers, including faculty, trainees, and pharmacists, were also interviewed, using the same questionnaire to evaluate their attitudes of incorporating TDM in hypertension management.

Results: 90% (9/10) of patients interviewed were supportive of TDM use in clinical practice. Similarly, 100% (10/10) of providers thought TDM was a good idea and should be used regularly. On subsequent questioning, 78% (7/9) of patients who felt TDM was a good idea expressed reservation that TDM could negatively impact the physician-patient relationship. Nonetheless, 86% (6/7) of these patients felt TDM could be a useful tool to identifying and solving non-adherence of antihypertensive drugs, if used in a non-confrontational and emphatic manners. Amongst providers, 90% (9/10) felt TDM may negatively impact the physician-patient relationship, yet felt TDM could still be useful in addressing non-adherence.

Conclusion: TDM was found to be well accepted amongst patients and providers though between 80-90% of patients and providers still had concerns that TDM could negatively impact the physician-patient relationship. However, majority of patients and providers believed that TDM could be an effective tool in identifying and solving barriers to adherence, if the providers are sensitive to the patients' specific needs. Our survey suggested feasibility of adopting TDM in improving medication adherence if used in the appropriate context.

Presentation #85

Title: An Unexpected Cause of Acute Kidney Injury Post Liver Transplant: Secondary Hyperoxaluria

Presenter: Kiran N Khan

Authors: Kiran N. Khan. MD; Mythili Ghanta, MD

Faculty Mentor: Mythili Ghanta

Abstract

Background: Most common etiology of acute kidney injury (AKI) post liver transplant (LT) remains acute tubular necrosis (ATN). We present a case of secondary hyperoxaluria post LT as an unexpected cause of AKI. Case: The patient is a 59-year-old Caucasian male who underwent orthotopic LT for alcoholic cirrhosis. He had no known history of kidney disease prior to LT, however developed anuric AKI during the immediate post-transplant period suspected to be from ATN in the setting of shock requiring renal replacement therapy until the third post-operative day. Subsequently the kidney function partially improved but did not recover to prior baseline. He then had a second hospital admission for Clostridium difficile colitis six weeks post LT presenting with rising serum creatinine and diarrhea. Failure of AKI improvement despite treatment of infection and volume repletion led to a kidney biopsy which showed moderate acute tubular injury and abundant intratubular oxalate crystals. A 24-hour urine oxalate was reported to be elevated at 0.50 mmol/day. Unfortunately renal function never recovered and patient remained dialysis dependent despite aggressive hemodialysis to clear oxalate, dietary oxalate restriction and oral calcium therapy to prevent enteric absorption of oxalate. He was listed for kidney transplant but inactivated due to financial reasons.

Discussion: Oxalate nephropathy is a devastating form of AKI often times associated with progression to ESRD. The differential diagnosis for oxalate nephropathy in this case includes enteric hyperoxaluria versus donor derived primary hyperoxaluria post LT associated with defective enzyme activity. This distinction is important to make as diagnosis of donor derived primary hyperoxaluria warrants repeat liver transplant. Unfortunately genetic studies could not be performed due to lack of donor DNA and increased risk of bleeding complication with allograft liver biopsy. The patient was diagnosed with acute secondary oxalate nephropathy due to alteration in intestinal microflora from chronic severe clostridium difficile colitis causing increased gastrointestinal absorption of oxalate. This case highlights the fact that oxalate nephropathy remains an uncommon cause of AKI and challenging to diagnose. High index of suspicion is needed for accurate diagnosis. When AKI remains unexplained renal biopsy plays a key role in establishing the diagnosis.

Presentation #86

Title: Scurvy in a well-developed adult male

Presenter: Lauren Franzblau

Authors: Lauren Franzblau, MD; Catherine Chen, MD

Faculty Mentor: Catherine Chen

Abstract

Case Presentation: A 51-year-old man presented to the ED after a mechanical fall at home with head trauma and loss of consciousness. Apart from his head injury he had no complaints. He had not seen a physician in over 30 years and had no known medical problems. Social history revealed binge drinking of 6-12 beers on weekends and financial instability with inconsistent access to food. Review of systems was negative for seizures, palpitations, chest pain, and weight loss. He was afebrile and hemodynamically stable. Examination revealed a well-developed man with BMI of 29. In addition to a scalp laceration and forehead hematoma, he was noted to have a petechial rash on his lower extremities, scattered ecchymoses, and severe periodontal disease with bleeding gums. Work up for syncope and closed head injury was unremarkable. However, he had a normocytic anemia with elevated RDW. Albumin was 3.6. Plasma ascorbic acid was undetectable. He was treated with oral vitamin C as well as empiric thiamine and folate.

Discussion: Vitamin C deficiency, or Scurvy, was first described over 3500 years ago. Although the most famous cases come from seafarers, land-based scurvy has accompanied wars and famine. Today, scurvy is rarely seen in developed countries. It is isolated to the elderly and very young who have limited food access and to patients with malabsorptive disorders, food avoidance, or unusual diets. The body's vitamin C stores can be depleted in as little as 4-6 weeks, though symptoms take longer to develop. This patient likely developed scurvy through longstanding food insecurity and alcohol abuse. He reported no dietary restrictions, and his normal albumin, stable weight, and normal muscle mass argue against a malabsorptive disorder. He displayed characteristic bruising, petechiae, bleeding gums, and iron deficiency anemia. Other symptoms include fatigue, body aches, and brittle "corkscrew" hairs. When scurvy is suspected, it can be confirmed with a plasma ascorbic acid level. Oral supplementation with vitamin C is typically adequate and long-term sequelae are rare. This interesting case demonstrates how scurvy can arise from alcohol abuse and poor oral intake in a well-developed adult male without other signs of malnutrition.

Presentation #87

Title: Use of Home BiPAP for Refractory Vocal Cord Dysfunction (VCD)

Presenter: Mariam Guenther

Authors: Mariam Guenther, MD; Won Lee, MD; Dave Khan, MD

Faculty Mentor: Dave Khan

Abstract

Background: VCD may be mistaken for anaphylaxis. Treatment of VCD is typically with speech therapy. Reassurance/supportive care may be used acutely for mild cases but more severe cases have been treated with heliox or CPAP.

Methods: We present a patient with refractory VCD who responded to home BiPAP therapy.

Results: A 33 yo woman presented with a history of recurrent "anaphylaxis". Within 6 months she had 7 severe episodes, 5 resulting in intubation. Episodes began with chest flushing, and pruritus and within minutes she developed severe dyspnea with chest/throat tightness, and stridor. She also reported more frequent minor episodes that did not result in urgent care visits. No triggers were identified including foods, drugs, exercise, or insect stings. Review of prior medical records revealed no documented rash or hypoxia, but occasional mild hypercarbia on ABGs. Duration of intubation ranged between 12-24 hours and laryngoscopy after intubation showed no evidence of laryngeal edema. Serum tryptase was normal. Due to concerns for VCD, speech therapy was initiated with improvement in mild episodes but she continued to go the ED and was hospitalized for more severe episodes. Due to recurrent admissions despite speech therapy and lack of availability of heliox at local EDs, AUTO BiPAP was recommended (min 5, max 14, PS 5). Since using home BiPAP, she has not had any further hospitalizations or intubations for her VCD.

Conclusion: For severe refractory cases of VCD, use of home BiPAP may be considered to potentially eliminate hospitalizations and intubations.

Presentation #88

Title: Hypercapnic respiratory failure in a patient with heart failure: a delayed diagnosis

Presenter: Mary Hon

Authors: Mary C. Hon, MD; Nathan Tobey, MD; Craig Glazer, MD

Faculty Mentor: Craig Glazer

Abstract

Case Presentation: A 53 year old man with history of recurrent venous thromboembolism and combined systolic and diastolic heart failure (EF 22%) was admitted to the ICU for decompensated heart failure with respiratory acidosis. He had several prior hospitalizations for decompensated heart failure, during which respiratory acidosis was noted. His hemodynamic status rapidly improved with appropriate management; however, respiratory acidosis (ABG 7.27/79/84) persisted despite BiPAP support, consistent with prior admissions. Workup for etiologies of chronic hypercapnia revealed mild reduction in FVC and FEV1 (4.41L, 80% and 3.35L, 78%, respectively) with normal TLC (6.64L, 88% of predicted). His habitus (BMI 22) was not consistent with obesity hypoventilation, and a small resolving pleural effusion conferred low likelihood as causes of ventilation restriction. Chest imaging revealed no interstitial lung disease or elevated diaphragm. Neuromuscular exam was unremarkable. Thus, it was felt by exclusion the likely etiology was decreased central respiratory drive. MR brain revealed infarct of the right dorsolateral medulla and absent flow of the intracranial right vertebral artery.

Discussion: Central respiratory drive includes three distinct pathways: automatic/metabolic, behavioral, and emotional. Each pathway corresponds to separate anatomic regions of the brain. The automatic/metabolic limb of respiratory drive maintains normal acid-base status and oxygenation via signals originating from the dorsolateral tegmentum of the pons and medulla. We conclude our patient had central apnea due to disruption of the automatic respiratory drive, which resulted in poor ventilation during sleep and abnormal respiratory rate and rhythm while awake. Our patient had poorly controlled heart failure, which we conclude led to delayed diagnosis and treatment for central apnea due to ischemic insult.

Presentation #89

Title: Prostate Cancer Patients on ADT: Specialty clinic collaboration and the Electronic Health Record Can Improve Bone Health Monitoring

Presenter: Megan Milne

Authors: Megan Milne, MD; Jeong-hee Ku, MD; Ugis Gruntmanis, MD

Faculty Mentor: Ugis Gruntmanis

Abstract

Background: Androgen Deprivation Therapy (ADT) is an important cause of iatrogenic osteoporosis and a common treatment in prostate cancer. Prostate cancer patients on ADT are at increased risk of minimal trauma fractures and decreased bone density through chemical castration We developed the High-Risk Osteoporosis Clinic (HIROC) to manage patients at high risk of these complications. However, referrals to HIROC initially was low. A quality improvement initiative implemented a Best-Practice Advisory (BPA) and prostate cancer provider education in 2014 to improve referral rates.

Methods: Fishbone diagrams were constructed to reveal causes of suboptimal bone health management in urology patients. Next, Best Practice Alerts were created for Gonadotropin-releasing Hormone agonist orders in EPIC. Then urology clinic nursing, residents and faculty were educated regarding HIROC BPA. Periodic chart reviews were conducted to assess referral rates.

Results: Prior to the quality improvement initiative, the prostate cancer patient referral rate to the HIROC clinic was 4%3. BPA implementation in 2014 increased referral rates to 21%3. Staff education in 2015 increased referral rates to 44%3. Long-term efficacy of BPA and patient education was assessed with chart review of UTSW prostate cancer patients seen in urology clinic from March 2017 - April 2018. Referral rate further increased to 59%. Of the 113 patients, only 32 had received anti-resorptive therapy, either denosumab or bisphosphonate therapy, at the time of chart review. Of the patients receiving anti-resorptive therapy, 75% had been referred to HIROC. 48 of 67 patients referred to HIROC had duel-energy X-ray absorptiometry (DEXA) completed or pending, and 50 of these 67 had vitamin D levels obtained or pending. Only 7 of the 46 patients not referred to HIROC had DEXA completed, and 3 of these 46 patients had vitamin D levels obtained or pending.

Conclusions: Best-Practice Advisories and prostate cancer provider education produced a sustained increase in HIROC referrals. A higher proportion of patients referred to HIROC had bone health assessed with DEXA scan and vitamin D levels compared to patients who were not referred.

Presentation #90

Title: Assessing Documentation of Non-Pharmacologic Therapies in Osteoarthritis

Presenter: Megan Milne

Authors: Megan Milne, MD; Una E. Makris, MD

Faculty Mentor: Una E. Makris

Abstract

Background: Osteoarthritis is the global leading cause of chronic disability in older adults. Non-pharmacologic interventions are important guideline- concordant components in managing osteoarthritis. A quality improvement initiative was proposed at the Dallas VAMC Rheumatology clinic to assess and improve documentation of non-pharmacologic therapies offered to veterans with knee osteoarthritis.

Methods: Fifty charts were reviewed from the VA Rheumatology injection clinic from May through June 2018. The Assessment and Plan was reviewed for documentation of non-pharmacologic interventions: joint injection, land-based exercise, aquatic exercise, weight loss, diet counseling, PT participation, thermal therapies, topical analgesics, PMR referral, walking aids, knee braces, self-management programs, psychiatric intervention, Tai Chi, yoga, acupuncture, or podiatry referral. A new CPRS note template for osteoarthritis patients was developed for rheumatology clinic to improve both counseling and documentation. Once the template is live for three months, another 50 charts will be reviewed to evaluate changes in documentation rates.

Results: Only 10 (20%) plans documented counseling on regular land-based exercise; one (2%) on aquatic therapy; and 18 (36%) on weight loss. Only five (10%) plans document nutrition or diet counseling. Three (6%) plans documented referral to PMR, but 24 (48%) document PT participation. Two plans (4%) document use of walking aids. Seven plans (14%) documented use of braces. Nearly all (98%) plans documented management of osteoarthritis with joint injections (the purpose of their visit), although 42/50 received an injection at that visit. Topical analgesics were commonly documented. 25 (50%) plans recommended Voltaren, 6 (12%) recommended Biofreeze, and 1 (2%) recommended OTC topicals. One plan documented a psychiatric intervention. One plan documented use of thermal therapies. Zero patients were recommended self-management programs, recommended Tai Chi or yoga, referred for acupuncture or dry needle therapy, or referred to podiatry. The intervention template is currently in revision.

Conclusions: There is room for improvement in counseling and referral for non-pharmacologic modalities. The next phase of this project will assess whether the template note improves documentation of non-pharmacologic therapies in patients with osteoarthritis.

Presentation #91

Title: Acute kidney injury recovery in hemodialysis-dependent hospital survivors discharged to an acute rehabilitation facility

Presenter: Meredith McAdams

Authors: Meredith McAdams, MD; Melissa Jordan, MD; Victor Ortiz-Soriano, MD; Brian Armentrout, PA; Florence Lima, PhD, MS; Javier Neyra, MD, MSCS; L. Parker Gregg, MD

Faculty Mentor: L. Parker Gregg

Abstract

Background: Acute kidney injury-requiring dialysis (AKI-D) occurs in about 5% of hospitalized patients and is associated with adverse outcome. Little is known about the incidence of AKI-D recovery post-discharge. We examined AKI-D recovery in hospital survivors that were discharged to a long term acute care facility with the need of acute hemodialysis (HD) therapy.

Methods: Retrospective cohort study of 42 patients who were admitted to University of Kentucky Hospital, suffered from AKI-D at UK and were discharged to an affiliated LTACH, Select, for further management of AKI-D from 8/2015-5/2018. AKI-D recovery was defined as the patient no longer requiring additional HD therapy for AKI. Renal status was assessed at discharge from LTACH as well as after, follow up period ended 5/2018.

Results: 69% of patients (n=29) recovered their renal function by time of discharge from Select. 5 patients, 12% died before being discharged from Select. At the time of final follow up 24/29 patients (83%) of the patients who recovered were alive and not on HD. Of the 8 patients who required continued HD on discharge 1 recovered their renal function at time of final follow up. For SELECT recovery, anemia and the total number of inpatient RRT days were significantly associated with non-recover and death.. For Long-term outcome, anemia and the number of intradialytic hypotension events were significantly associated with continued HD and death.

Conclusions: At least 1 out of 2 patients discharged to an acute rehabilitation facility with AKI-D diagnosis recovered kidney function no longer requiring HD therapy for AKI. HD-specific characteristics may play a central role in the development of risk-stratification tools for the prediction of AKI-D recovery post-discharge.

Presentation #92

Title: Kniest Syndrome: A Case Study of Achondroplastic Dwarfism

Presenter: Nate Milburn

Authors: Nate Milburn, MD; Paul Gudmundsson; David Tietze, MD

Faculty Mentor: David Tietze

Abstract

Case Presentation: Kniest syndrome is a rare form of dwarfism that occurs secondary to a mutation in the COL2A1 type II collagen gene. This collagen not only helps form osseous structures, but also the vitreous of the eyes and part of the auditory conduction system. Patients with Kniest Syndrome often suffer from blindness, deafness, short stature, and a characteristic radiographic finding of dumbbell-shaped long bones and punched-out holes in the bones. These patients frequently have debilitating and immensely painful hip dysplasia.

Our patient is a 41-year-old man with past medical history of Kniest syndrome, leading to partial blindness, hearing deficits, and hip dysplasia, and multiple hip and spine surgical interventions performed in his youth. The patient was initially seen by Orthopaedic Surgery, who determined him to be a poor surgical candidate, then was evaluated by our team in sports medicine. He came to the office complaining of severe bilateral hip pain over the last six months. Pain "in the buttocks" was described as worse with movement and sitting, but improved with standing. The degree of pain has caused mobility limitations and an elevated fall risk. Physical exam is notable for his height of 3'11", weight of 85 pounds, and BMI of 27. His gait is compromised by a severe limp, but has equal leg lengths and normal feet.

We performed ultrasound-guided steroid injections to bilateral hips, resulting in an excellent response on follow up. Our patient had noted a significant improvement in pain, became more functional at home, and did not require another steroid injection for fifteen months.

Our case describes a very rare form of dwarfism that lead to severe hip dysplasia with significant comorbid pain and physical limitations. In this particular patient it was noted that surgery was unlikely to provide lasting benefit and cause a substantial amount of morbidity given his other limitations. As a result, steroid injections were performed and proved to be an excellent therapy that produced a satisfactory response. This case highlights the necessity for patients typically not thought of as appropriate referrals for injections to be fully evaluated for possible therapeutic interventions.

Presentation #93

Title: A Case of Bilateral Patellar Subluxation

Presenter: Nate Milburn

Authors: Nate Milburn, MD; Ami Kapadia; David Tietze, MD

Faculty Mentor: David Tietze

Abstract

Case Presentation: A twenty-year-old female competitive gymnast with past history of atrial fibrillation, postural orthostatic tachycardia syndrome, and cubital tunnel syndrome presents with progressive bilateral knee pain over the last 5 years. Pain is described as 7/10, aching, non-radiating, and began after an episode of kneecap dislocation with subsequent episodes of subluxation. She denies swelling, catching, locking, and instability. She also endorses a history of easy bruising, weakness, and bilateral wrist fractures. On physical exam, she can hyperextend her thumb to touch her forearm. She is stiff-kneed and experiences knee pain with ambulation. MRI of bilateral knees demonstrated diffuse grade I-II chondromalacia of the patella. Imaging also shows mild bilateral patella alta, mild effusions, and no sign of prior internal derangement. The patient was diagnosed with bilateral patellar instability secondary to Ehlers Danlos and was referred to physical therapy with medical management. However, she did not receive adequate results with this regimen, and given the severity of her disease she was referred to orthopedic surgery for consideration of MPFL reconstruction.

Discussion: This case is a classic presentation of Hypermobile (previously type III) Ehlers Danlos Syndrome (hEDS), part of the larger group of Ehlers-Danlos disorders that cause connective tissue defects. Hypermobile EDS is considered the least severe type of EDS and genetically autosomal dominant (mutated genes unknown). Classic findings of hEDS include joint laxity, soft and mildly hyperextensible skin, easy bruising, and chronic musculoskeletal pain. Other important clinical features associated with hEDS include sleep disturbance, fatigue, postural orthostatic tachycardia, functional GI disorders, dysautonomia, anxiety, and depression. Subluxations and dislocations that occur spontaneously or with minimal trauma are also common and cause acute pain. Clinical diagnosis of hEDS requires the presence of three criteria: generalized joint hypermobility; evidence of syndromic features/musculoskeletal complications/family history; and exclusion of alternative diagnoses. Management of the condition involves physical therapy to increase core and extremity muscle tone. Assistive devices can be used to improve joint stability (braces) or offload stress on joints (wheelchair). In addition, patients should optimize maintain bone density, but may require surgery in some select cases if conservative therapies fail.

Presentation #94

Title: Gamekeeper's Thumb: A Case Study of Ulnar Collateral Ligament Injuries

Presenter: Nate Milburn

Authors: Nate Milburn, MD; Paul Gudmundsson, David Tietze, MD

Faculty Mentor: David Tietze

Abstract

Case Presentation: Our patient is a 20-year-old male with past medical history significant for Osgood Schlatter-associated knee pain and adolescent surgery to repair a metacarpal thumb fracture presenting for new onset four-day history of right wrist and hand pain. The patient was injured during a baseball play in which a ball forced his thumb into radial deviation. In addition to the pain, the patient reports feelings of instability and weakness, but denies swelling or numbness. Patient rated his pain to be a 2 out of 10 and notes mild improvement with the use of ice, Advil, and a splint. Physical exam: The patient is a well-developed, well-nourished, age-appropriate young male who was alert and oriented. Radial pulses were intact and symmetrical. Median, radial, and ulnar nerves are all intact to motor and sensory function. The right upper extremity has excellent motion and stability outside of the affected thumb. Pain is located along the ulnar border of the thumb at the level of the ulnar collateral ligament of the metacarpal phalangeal joint. After initial examination it was decided that he should proceed with additional imaging and continue to wear a thumb splint in the meantime. MRI demonstrated a complete tear of the right UCL at the level of the MCP joint. The orthopaedic surgeon discussed the likelihood of continued thumb instability with the patient and recommended treatment with surgical repair.

Our case describes an orthopedic injury that can negatively impact functional thumb movements required to complete various activities of daily living. In this particular patient it was noted that surgery and postoperative physical therapy was the best course of action.

Presentation #95

Title: Interventions to Improve Time to Appointment and Outcome Variables in the Pediatric to Adult Transition of Care in Rheumatology

Presenter: Nicole Bitencourt

Authors: Nicole Bitencourt, MD; Una Makris, MD; Tracey Wright, MD; Bonnie L. Bermas, MD; E. Blair Solow, MD, MSCS

Faculty Mentor: E. Blair Solow

Abstract

Background: The transition from pediatric to adult care is a vulnerable period that can lead to poor health outcomes. In order to address prolonged time to appointment and increased healthcare utilization during the transfer period, we established dedicated appointment slots for patients transferring from pediatric to adult care in rheumatology and improved the efficiency of the referral process.

Methods: We reviewed rheumatology encounters from pediatric patients transitioning to an adult clinic between March 2014 and February 2018 (pre-intervention) and from March 2018 to January 2019 (post-intervention). Demographics, diagnoses, medical coverage, insurance lapse, type of referring provider, time from referral and from final pediatric visit to first adult visit were extracted. Hospitalizations, emergency department visits, missed appointments, and self-reported medication non-adherence were the outcomes of interest. Means pre and post intervention were compared using the t-test.
Results: Eighty-five patients between ages 17 and 21 transferred from pediatric to adult rheumatologic care prior to the intervention and 27 patients transferred following the intervention. Median time from referral to scheduled appointment with adult rheumatology decreased significantly from 152 to 84 days, and percentage of patients with an appointment longer than 180 days following referral fell significantly from 46% to 7% of patients. Time from final pediatric to first adult visit decreased significantly from a median of 138 days to 30 days. The percentage of patients with a gap of greater than 180 days between pediatric and adult visits declined from 40% to 8% of patients. Hospitalizations and emergency department visits during the interim period between pediatric and adult visits declined significantly from 29% to 7% and from 38% to 11%, respectively. Percentage of patients who had self-reported medication non-adherence at first adult appointment also declined significantly. Insurance lapse between transfer also declined significantly.

Conclusions: Dedicated appointment slots and improving the referral process were effective in reducing time to first adult appointment, decreasing health care utilization during the transfer period, and decreasing self-reported medication non-adherence at first appointment among patients transferring from pediatric to adult rheumatologic care in a large public safety net hospital system.

Presentation #96

Title: Overutilization and Financial Impact of Intravenous Magnesium Repletion - a High Value Care Initiative

Presenter: Nimish N. Shah

Authors: Nimish N. Shah, MD; Christopher Mathew, PharmD; Timothy J. Brown, MD; Deepak Agrawal, MD, MBA; Sandeep R. Das, MD, MPH

Faculty Mentor: Sandeep R. Das

Abstract

Background: Serum magnesium levels ([Mg]) are often maintained at >2 mg/dl in hospital patients despite poor correlation between serum and total body Mg stores and lack of data supporting routine Mg repletion. Oral Mg oxide (MgO) is as effective as intravenous (IV) Mg sulfate (MgSO4) at repleting Mg stores but IV MgSO4 is significantly more expensive and burdensome to administer. Objective: To determine the frequency and relative cost impact of IV versus oral Mg repletion.

Methods: We queried our EHR for all instances in which Mg was administered within 24 hours after [Mg] measurement among adults at Parkland Hospital from 10/2016 to 10/2018, excluding obstetric and perioperative uses. The data included [Mg], route of administration, and patient location. Using the hospital medication cost for IV and oral Mg, we determined the potential savings of a change in route (not including administration costs). This quality improvement study was deemed exempt from IRB review.

Results: Overall, there were 46,852 instances of Mg repletion. The IV route was used in 80% cases, of which 53% were for [Mg] ≥ 1.8 mg/dL. The mean [Mg] preceding repletion was 1.80 and 1.84 mg/dL for the IV and oral routes, respectively ($p<0.0001$). The estimated direct cost savings of repleting Mg after [Mg] of ≥ 1.8 mg/dL with 400mg oral MgO instead of 2 g IV MgSO4 was $193,210 over 2 years.

Conclusion: IV repletion for mild hypomagnesemia was common. The mean [Mg] for patients treated by the IV versus oral routes were not meaningfully different, suggesting route differences are not driven by perceived severity of hypomagnesemia. The pattern of IV MgSO4 use suggests widespread overuse with a large financial impact. Although unmeasured, reducing the use of IV repletion may also reduce other safety risks and costs associated with IV administration, including IV access complications, delayed care transitions, infections, and staffing burden. We have thus implemented an indication-based order panel in the EHR to replace direct ordering of IV MgSO4. Further study of the effect of this order panel on reducing IV Mg repletion is underway.

Presentation #97

Title: Not-so-Smartlinks: Eliminating Superfluous Shortcuts to Reduce Discharge Medication Documentation Discrepancies

Presenter: Nimish Shah

Authors: Nimish Shah, MD; Taylor Roberts, MD; Brian Duffy, MD; Emmanuel Johnson, MD; Timothy J. Brown, MD; Nainesh Shah, MD

Faculty Mentor: Nainesh Shah

Abstract

Background: Medication errors are prevalent at discharge and contribute to harmful adverse drug events with potentially avoidable healthcare utilization and cost. Medication documentation errors may occur in discharge summaries (DS), discharge instructions (DI), or electronically generated discharge medication lists (eDML). Within Epic, the electronic health record (EHR) at our institution, each of these document types may contain unique discharge medication lists, creating opportunities for discrepancies. Providers traditionally use Smartlinks to import static medication lists into DS and DI, but we believe the dynamic eDML is the most accurate. We aimed to identify the frequency of discharge medication documentation errors among these sources and to reduce these errors to zero within one year.

Methods: This initiative was conducted at Parkland Hospital and Clements University Hospital (CUH). In 2016, the Hospital Medicine group and Internal Medicine residents at Parkland were instructed via group didactics to not import medication lists into DS and DI. After approval by the EHR governance committee, Smartlinks were disabled in April 2017. We performed a randomized chart review of 60 discharge encounters each from several departments between January 1 and March 30, 2017. We compared medication names, number of medications, dosages, and signatures among the DS, DI, and eDML for each encounter. Post-intervention, a randomized chart review of 60 discharge encounters each from the same departments between July 1 and September 30, 2017 was performed. We also randomly reviewed CUH discharge encounters from the same dates; however, no intervention was performed.

Results: Pre-intervention, 76% of Parkland DS contained a medication list, and 21% had errors. Post-intervention, these rates fell to 45% and 10%, respectively. Pre-intervention, 40% of Parkland DI contained a medication list, and 12% had errors. These rates fell to 18% and 6%, respectively, post-intervention. DS or DI that contained a medication list post-intervention utilized alternative active Smartlinks. CUH findings were similar to the pre-intervention pattern at Parkland.

Conclusions: We demonstrate that discrepancies in discharge medication lists generated in our institutions' EHRs are prevalent, and that modifying EHR functions may reduce discharge medication documentation errors.

Presentation #98

Title: Lenalidomide Induced Hypersensitivity Pneumonitis

Presenter: Omer Mirza

Authors: Omer Mirza, MD; Megan Kypreos, MD; John Fitzgerald, MD

Faculty Mentor: John Fitzgerald

Abstract

Background: Lenalidomide is a thalidomide analog used to treat multiple myeloma and myelodysplastic syndrome. While pulmonary side effects are rare, case reports have suggested the drug may be associated with hypersensitivity pneumonitis; however, this has yet to be confirmed histologically.

Case Presentation: In this case we present a 68-year female with a history of IgG kappa multiple myeloma with disease progression on lenalidomide and ixazomib who was admitted for acute hypoxic respiratory failure. CT chest showed bibasilar peribronchovascular ground glass opacities with centrilobular nodules. Bronchoscopy was performed with BAL showing 51% lymphocytes. Transbronchial biopsy showed loosely formed focal granulomatous inflammation, with stains negative for AFB and fungi. The patient was diagnosed with hypersensitivity pneumonitis. Lenalidomide was discontinued, and steroid taper was initiated. Two weeks later the patient was seen in clinic with improvement in oxygenation and radiographic resolution of infiltrates. Unfortunately, the patient left the country and was lost to follow up.

Discussion: Lenalidomide functions by inducing apoptosis of tumor cells, inhibiting angiogenesis, and upregulating the host immune system. The most commonly reported side effects include infection, venous thrombosis, malignancy, hepatotoxicity, and hypersensitivity reactions. Pulmonary side effects are exceedingly rare, but several case reports have suggested lenalidomide may cause various forms of interstitial lung disease. Hypersensitivity pneumonitis, a subtype of interstitial lung disease, requires high clinical suspicion and a prompt diagnosis, as identification and removal of the offending agent leads to clinical improvement. While case reports have suggested that lenalidomide may induce hypersensitivity pneumonitis, this has never been demonstrated on transbronchial biopsy. This case demonstrates the key clinical and histopathologic findings consistent with hypersensitivity pneumonitis. Cessation of lenalidomide and a short course of steroids led to rapid improvement in the patient's oxygenation. When a patient taking lenalidomide presents with dyspnea and a new oxygen requirement, providers should be aware of the potential for lenalidomide to cause hypersensitivity pneumonitis.

Presentation #99

Title: Post Dialysis Orthostatic Blood Pressure Is Not Associated With Extracellular Volume in Hemodialysis Patients

Presenter: Prince Aryeetey

Authors: Prince Aryeetey, MD; L. Parker Gregg, MD, MSCS; Peter VanBuren, MD, MSCS

Faculty Mentor: Peter Van Buren

Abstract

Background: Frequent blood pressure (BP) measurements are obtained before, during, and after hemodialysis in the outpatient dialysis center primarily for the purpose of monitoring the safety of the treatment. However, the pattern of intradialytic BP change is becoming increasingly recognized as a tool to assess extracellular volume (ECV). Prior data on intradialytic BP patterns focused on seated blood pressure measurements. Although follow-up standing measurements are obtained routinely, it is unknown if orthostatic blood pressure changes after dialysis provide additional information on ECV.

Methods: In this cross-sectional study of 55 prevalent hemodialysis patients, we obtained BP measurements before and after dialysis in the seated and standing position as well as every 30 minutes in the seated position during dialysis per protocol. We measured ECV before and after dialysis using whole-body multifrequency bioimpedance spectroscopy. We compared post-dialysis ECV among participants with and without orthostatic systolic BP decrease (defined as a ≥10 mmHg decrease from post-dialysis seated to post-dialysis standing BP) and also compared orthostatic BP changes among tertiles of post-dialysis ECV.

Results: There were 26 (47%) participants with orthostatic systolic BP decrease, with a mean of -24.4±14 mmHg, and 29 (53%) participants with blood pressure increases or decreases <10 mmHg, with a mean of 6.74±12, $p<0.0001$. The mean proportion of body weight that was extracellular water was 26.6±4.8% in the orthostatic group and 25.2±4.97% in the non-orthostatic group ($p=0.3$) for pre dialysis measurements and 24.8±4.7% in orthostatic participants and 23.3±4.6 in non-orthostatic subjects ($p=0.2$) for post dialysis measurements. When percentage of body weight that was extracellular water was divided into tertiles, there was no difference in the post-dialysis orthostatic blood pressure change between the 1st and 3rd tertiles (1st tertile: -3.71±26, 3rd tertile -8±14 mmHg, $p=0.5$).

Conclusions: We did not find any association between the orthostatic change in systolic BP and objective measurements of ECV using bioimpedance spectroscopy. While we were unable to confirm similarities in intravascular blood volume between the two groups, we conclude that post dialysis orthostatic blood pressure change is not a reliable assessment of overall ECV status in hemodialysis patients.

Presentation #100

Title: Two-thirds of Long-Term Acute Care Hospital Transfers are Possibly Inappropriate: Findings from a Multicenter Study of Medicare ACO Beneficiaries

Presenter: Ross Schumacher

Authors: Ross C. Schumacher, MD; Kate Krause, BS; Michael Chiu, MD; Anil N. Makam, MD, MAS

Faculty Mentor: Anil Makam

Abstract

Long-term acute care hospitals (LTAC) care for patients with extended inpatient care needs. As such, LTACs are the most expensive post-acute care setting. There is wide variation in LTAC use among Medicare beneficiaries, with certain hospitals and regions preferentially transferring patients to an LTAC instead of less-intensive and less-costly alternative settings, such as skilled nursing facilities (SNFs). While the large variation suggests overuse of LTACs, the reasons and clinical appropriateness for LTAC transfer in high LTAC use areas are unknown, and of great interest to Medicare and Accountable Care Organizations (ACOs) interested in more efficiently managing post-acute care. We conducted a structured chart review of consecutive hospitalizations by Medicare beneficiaries transferred to an LTAC from January 2017 to April 2018 from two university hospitals participating in a 30-hospital Next Generation ACO in North Texas, an extremely high LTAC use region. For each transfer, two investigators independently abstracted demographic information, clinical characteristics, reasons for transfer, and clinical appropriateness of LTAC transfer. We assessed appropriateness using a 3-level Likert scale, where appropriate was defined as possibly appropriate or appropriate. Differences were resolved through negotiated consensus. Among 31 LTAC transfers, the mean age was 67.7, 38.7% female, 35.4% had an ICU stay ≥3 days, 16.1% had a new tracheostomy, and only 3.2% were mechanically ventilated at the time of discharge. Only one-third (32.3%) of LTAC transfers were considered appropriate. Among the 21 inappropriate transfers, the most common primary reasons for transfer were physician/patient preference (33.3%) and intravenous antibiotic treatment (28.5%). Wound care was documented as a primary or secondary reason for 61.9% of inappropriate transfers (4 primary, 9 secondary). Two-thirds of patients transferred to an LTAC in a high LTAC use area were deemed inappropriate, and likely could have been safely discharged home with home health or transferred to a SNF. Establishing more explicit criteria for LTAC transfer and ensuring home health agencies and SNFs are able to meet patient care needs (particularly antibiotic therapy and wound care) may mitigate LTAC use by patients who do not require this level of care.

Presentation #101

Title: Intracranial response to immunotherapy in metastatic renal cell carcinoma with brain metastases: An institutional experience.

Presenter: Roy Elias

Authors: Roy Elias, MD; Jonathan Schoenhals, BS; Nirmish Singla, MD; Raquibal Hannan, MD; James Brugarolas, MD, PhD

Faculty Mentor: James Brugarolas

Abstract

Background: Immune checkpoint inhibitors (ICI) have become a mainstay of therapy in metastatic renal cell carcinoma (RCC); however, pivotal trials have thus far excluded patients with brain metastases (BM). Thus, clinical data regarding the efficacy of ICI in RCC patients with BMs are limited. Here, we report the outcomes of RCC patients with BM treated with ICI at our institution.

Methods: All patients with RCC who received ICI between January 1, 2013 and January 1, 2018 at our institution were identified. Intracranial response of BMs was assessed by modified RECIST v 1.1 criteria. Oncologic outcomes included time to next treatment (TNT), defined as the duration from starting ICI until the next line of systemic therapy, and intracranial progression free survival (iPFS). Brain metastases velocity (BMV), defined as the number of new BM over months of treatment, was measured during ICI and prior lines of systemic therapy.

Results: Of 90 RCC patients treated with ICI, 22 (24%) had BM at the time of starting ICI. There was no significant difference in median TNT based on the presence or absence of BM (5.3 (95% CI 2.4-8.3) months vs 10.2 (95% CI 5.8 - 14.6) months, respectively, p = 0.237). 21 (95%) had one or more lines of previous systemic therapy with tyrosine kinase inhibitors (TKI). The mean BMV during ICI therapy was 0.16 BM/mo vs 0.46 BM/mo on prior lines of therapy (mean difference 0.29 (95% CI -0.03 - 0.62, p = 0.07). Following ICI, 6 (27%) patients demonstrated an intracranial response, 3 (14%) PR and 3 (14%) SD. The median iPFS was 2.4 months (95% CI 0.39 - 4.41). Of patients with an intracranial response, 5 (83%) had a response lasting over one year.

Conclusions: ICI demonstrated a 27% intracranial response rate, however the median PFS was only 2.4 months which was mostly attributable to known progression of known metastases. There was a strong trend towards lower BMV on ICI when compared to TKI, and most patients who demonstrated local control had a response lasting over a year, suggesting that ICI may have a role in suppressing new BMs.

Presentation #102

Title: Osler's Nodes as the Presenting Symptom of Infective Endocarditis in a Congenital Heart Disease Patient

Presenter: Ryan Kabir

Authors: Ryan Kabir, MD; Andrew Sumarsono, MD; Beth Brickner, MD

Faculty Mentor: Beth Brickner

Abstract

Case Presentation: A 34 year old male with a history of double inlet left ventricle with D-transposition of the great arteries s/p classic Glenn and subsequent lateral tunnel Fontan procedures presented with left hand pain. Two days prior to presentation, he developed fevers to 102.5F and progressively worsening malaise and fatigue. On the day of presentation he developed new painful lesions on the tips of his fingers on the left hand. Of note, the patient was recently hospitalized for bleeding from chronic venous stasis ulcers of the lower extremities. On examination, the patient was afebrile, HR 126, BP 135/69, RR 20 with 94% SpO2. Cardiac exam revealed a known systolic murmur and a new early diastolic murmur. The patient had several small, violaceous, purpuric lesions on the dorsal and volar surfaces of his left fingertips that were exquisitely tender to palpation. Blood cultures were positive for MSSA, and transesophageal echo revealed a 5x9mm vegetation on the anterior mitral valve. The patient's skin lesions and blood cultures cleared with initiation of antibiotics. He was discharged home and completed a 6-week course of IV cefazolin and PO rifampin. Transthoracic echo several months later showed normal systolic function and resolution of the mitral valve vegetation.

Discussion: Endocarditis occurs much more commonly in adults with congenital heart disease. The estimated incidence of endocarditis for the general population is 3 to 7 cases per 100,000 person-years, but the incidence is 1.1 per 1000 patient-years in patients with congenital heart disease. Despite the higher risk, diagnosis of endocarditis in a congenital heart disease patient is still made via the Modified Duke Criteria. Osler's nodes are cutaneous findings classically associated with endocarditis. Osler's nodes are typically painful, poorly demarcated, violaceous papules that favor the finger pads. These are thought to be caused by immune complex deposition and small vessel vasculitis. These lesions occur more frequently in the setting of protracted bacteremia and were more commonly observed prior to the advent of antibiotics. Our patient demonstrates an interesting case in which Osler's nodes developed early in the course of endocarditis and represented the main presenting symptom.

Presentation #103

Title: Clinical Outcomes of Patients with and without Chronic Kidney Disease Undergoing Endovascular Revascularization of Infrainguinal Peripheral Artery Disease: Insights from XLPAD

Presenter: Ryan Kabir

Authors: Ryan Kabir, MD; Bassel Bou Dargham, MD;
Ishita Tejani, BDS, MS, MSPH; Subhash Banerjee, MD

Faculty Mentor: Subhash Banerjee

Abstract

Background: The overuse of iodinated contrast material is a major concern in patients with chronic kidney disease (CKD) undergoing peripheral vascular intervention. However, there remains a paucity of data analyzing the use of contrast material in CKD patients and associated outcomes. This observational study aimed to compare the use of contrast during peripheral vascular interventions in patients with and without CKD and their outcomes at 12 months.

Methods: Using the ongoing multicenter Excellence in Peripheral Artery Disease (XLPAD) registry (NCT01904851), we analyzed the data for a total of 3699 patients undergoing peripheral arterial intervention between the years 2005 and 2018 to compare the procedural information and clinical outcomes between patients with CKD to those without CKD on presentation. Clinical and procedural records entered into the Research Electronic Data Capture (REDCap) online software were reviewed to assess baseline patient characteristics, arterial lesion characteristics, procedural data, and outcomes. The main follow-up occurred at 12 months after the index procedure.

Results: 559 patients with CKD at baseline were compared to 3140 patients without CKD. Those with CKD presented with a significantly higher percentage of heavily calcified (48.40% vs. 38.12%; p=0.0001) and diffuse (66.90% vs. 61.54%; p=0.0065) lesions. On average, CKD patients received a smaller volume of contrast intra-procedurally (171.9 ± 98.82ml vs. 189.1 ± 107.5; p=0.0003) while there was no significant difference in the average duration of procedure or fluoroscopy time. Patients with CKD experienced significantly lower rates of procedural success (89.99% vs. 92.51%; p=0.0348) and were also found to have higher rates of death (7.69% vs. 2.99%; p=0.0001) at 12-month follow up. The odds of amputation over 12 months after adjusting for diabetes, hyperlipidemia, hypertension, and critical limb ischemia (CLI) presentation in the CKD group was 1.787 times that of the non-CKD group (95% CL 1.282-2.491).

Conclusions: While patients with CKD presented with significantly more complex lesions compared to non-CKD patients, those with CKD received a significantly lower volume of contrast intra-procedurally despite similar procedure duration between both patient groups. After adjusting for other baseline cardiovascular risk factors and CLI presentation, CKD patients also experienced significantly worsened peri-procedural and 12-month outcomes.

Presentation #104

Title: Insulinoma: Secreting but Not Appearing

Presenter: Sapna Patel

Authors: Sapna M. Patel, DO; Alan P.B. Dackiw, MD, PhD; William Moore, MD; Jessica Abramowitz, MD

Faculty Mentor: Jessica Abramowitz

Abstract

Case Presentation: Insulinomas are confirmed with biochemical testing and localized using computed tomography (CT), magnetic resonance imaging, endoscopic ultrasonography and if needed an intra-arterial calcium stimulation test. Rarely is unconventional radiography required for management. A 71-year-old female with no significant past medical history was referred for evaluation of hypoglycemia. She was noted to have frequent episodes of symptomatic hypoglycemia for two years prior to presentation. Symptoms resolved after treatment with high carbohydrate foods or juice. On several occasions severe hypoglycemia required emergency services assistance. Endocrine evaluation at an outside clinic during an episode of spontaneous hypoglycemia (serum glucose 30 mg/dL), found an elevated insulin level (20 U/ml, n<3.0 U/mL), C-peptide (4.3 ng/mL, n<0.6 ng/mL), and proinsulin (130 pmol/L, n<5.0 pmol/L) confirming insulin mediated hypoglycemia. CT scan of the abdomen localized a lesion to the tail of the pancreas, but based on radiographic appearance differential diagnosis included a splenule. She underwent an endoscopic ultrasound and magnetic resonance cholangiopancreatography of the abdomen both of which were unable to characterize the lesion. An intra-arterial calcium stimulation test indicated inconclusive results. A gallium-68 Dotatate scan showed no further distinction. Given the challenge of identifying the lesion, the decision was made in collaboration with radiology to complete a Tectnetium-99m sulfur colloid single-photon emission computed tomography (SPECT)/CT scan. This imaging modality shows accumulation of sulfur colloid in normal splenic tissue and is expected to show no radiotracer uptake in pancreatic tissue. The scan showed no significant accumulation in the area of concern presenting high suspicion for a neuroendocrine tumor. The patient underwent a partial pancreatectomy to remove the 1.4cm lesion with resolution of hypoglycemia post operatively.

Discussion: This was a challenging case of a biochemically proven insulinoma which required specialized imaging for localization and a multi-disciplinary approach for definitive management

Presentation #105

Title: A rare cause of infective endocarditis with Bipolaris spicifera

Presenter: Shannon Koh

Authors: Shannon Koh, MD; Brad Cutrell, MD

Faculty Mentor: Brad Cutrell

Abstract

Case presentation: A 61 year old man with history of congenital heart disease status post (s/p) multiple repairs, including most recently aortic root and mechanical aortic valve replacement, heart failure, and atrial fibrillation s/p pacemaker/defibrillator (ICD) placement presented with right arm paresthesia and pain. On exam he was afebrile with systolic murmur and mechanical heart sound present throughout the precordium. His right arm was pale with blue discoloration of his fingers and absent radial pulse. Labs were significant for WBC of 11,480 with 73% neutrophils. Computed tomography (CT) angiogram of the right arm showed complete occlusion of the distal right axillary artery, and he underwent successful thromboembolectomy. CT chest and transesophageal echocardiogram showed an ascending aortic thrombus and vegetations on the ICD leads. Pathology from the thrombus showed fungal elements concerning for a pigmented mold, and he was started on empiric ambisome and voriconazole. He underwent aortic root replacement and removal of his cardiac device. Fungal cultures from the thrombus and the aortic valve grew Bipolaris spicifera. Unfortunately, two weeks post op he developed altered mental status and later was found unresponsive due to large right sided hemorrhagic stroke and passed away.

Discussion: Fungal endocarditis (FE) is an uncommon (<5% of infective endocarditis cases) condition with high mortality (30-80%). Risk factors for FE include presence of a cardiovascular device (prosthetic valves, central lines, pacemaker/ICD), immunocompromised state, and use of injection drugs. Peripheral arterial embolization, as seen in our patient, is a common presentation of FE. Candida species are the most common cause of FE followed by Aspergillus species, then histoplasma capsulatum. Dematiaceous molds such as bipolaris species are an uncommon cause of FE. Bipolaris is a pigmented mold commonly found in the soil and plant debris. Management of FE includes both surgical (replacement of infected valve) and medical therapy. Treatment with amphotericin B initially is recommended and is sometimes paired with flucytosine or an azole. Induction therapy is followed by lifelong suppressive therapy. Unfortunately many cases remain fatal given the high rate of embolization and difficulty diagnosing a fungal etiology without pathology or positive blood cultures.

Presentation #106

Title: Multiple Interventions Can Reduce Rates of False Penicillin "Allergy" Relabeling After Negative Testing

Presenter: Shazia Lutfeali

Authors: Shazia Lutfeali, MD; Felicia Kasra, PharmD; Sheenal Patel, MD; Shyam Joshi, MD; Scott Tarver, PharmD; Kristin Alvarez, PharmD; Wenjing Wei, PharmD; Dave Khan, MD

Faculty Mentor: Dave Khan

Abstract

Background: Penicillin allergy testing successfully removes penicillin "allergy" in the majority of patients. However, prior studies have shown a frequency of 26-49% penicillin allergy relabeling after negative testing. This study evaluated the effect of several interventions to reduce false relabeling of a penicillin "allergy" after negative testing.

Methods: Inpatients at Parkland Hospital were evaluated for penicillin allergy testing via a pharmacist-driven protocol. Those with negative testing had the penicillin allergy label removed from their chart and negative test results documented in a procedure note. Interventions in place to prevent relabeling included patient counseling from an inpatient penicillin pharmacist, a wallet card specifying non-allergy to penicillin, additional patient counseling during a post-discharge phone call, and a best-practice advisory in the electronic medical record. Finally, patients with a re-label of penicillin allergy had charts reviewed and providers contacted to determine if the re-label was false and if so, the EMR was corrected.

Results: Over a 3.5 year period, a total of 665 patients at Parkland Hospital were evaluated for inpatient penicillin allergy testing. Of the 627 who completed the protocol, 97.6% had their penicillin allergy removed. Of those with negative testing, 11.6% were relabeled with penicillin allergy. After individual chart review and contacting providers, the majority were able to have their penicillin allergy label removed once again, leaving an overall relabeling rate of 1.8%.

Conclusion: This study shows that multiple interventions can significantly lower rates of false penicillin allergy relabeling.

Presentation #107

Title: HHV-8 Related Malignancies in HIV Patients

Presenter: Sheena Knights

Authors: Sheena Knights; MD, Ank Nijhawan, MD, MPH; Susana Lazarte, MD; Radhika Kainthla, MD; Mitu Bhattatiry, MS; Demi Krieger, MS

Faculty Mentor: Ank Nijhawan

Abstract

Background: Kaposi's sarcoma (KS) is an AIDS-related condition that is mediated by HHV-8. Although the incidence and mortality has decreased over time due to the advent of HAART, studies suggest there may be disparities in mortality based on geographic location and race/ethnicity, particularly African-American men in the South. Our objective is to describe the cohort of patients at Parkland with KS and evaluate predictors of mortality in Kaposi's sarcoma at Parkland, a large, safety-net hospital.

Methods: We reviewed records in EPIC at Parkland for diagnosis of HIV and Kaposi's sarcoma, multicentric Castleman's disease (MCD), or primary effusion lymphoma (PEL) between 1/1/2009 and 8/14/2018. We collected demographic information, HIV history, malignancy history and outcomes data on each patient.

Results: We found 244 patients with KS, 5 with MCD (2 of 5 also with KS), and 6 with PEL (5 of 6 also with KS), totaling 248 unique patients. 95% of patients were male, for most of them MSM (men who have sex with men; 79% of all patients) was their risk factor for acquiring HIV. 55.6% of patients were funded through Ryan White or were otherwise uninsured. 36% of patients were Hispanic, 33% were African-American and 30% were Caucasian. Median CD4 count and viral load at the time of cancer diagnosis were 45 and 70,283 respectively. 24% of patients have died, although there was a high lost to follow-up rate in this cohort.

Conclusions: We have described the demographics of KS in our cohort at Parkland. Our results reveal a larger proportion of Hispanic patients affected with KS than previously documented in the literature, disproportionate to the clinic demographics. We also found an overall mortality rate of 24%, though this is likely higher due to a high rate of lost to follow up.

Presentation #108

Title: Multifocal Liver Abscesses Mass-querading as Metastasis

Presenter: Taylor Roberts

Authors: Taylor Roberts, MD; Omer Mirza, MD; Megan Kypreos, MD; Catherine Chen, MD

Faculty Mentor: Catherine Chen

Abstract

Case Presentation: Mr. R is a 44 year old male with no prior medical history who presented to the Parkland ED with lower abdominal pain and subjective weight loss for 1 month. On arrival his blood pressure was 89/58 mmHg, heart rate 119 beats/min, temperature 37.3°C. Lactate was elevated to 4.4 mmol/L, white blood cell count was 10.03 x109 cells/L. Liver enzymes were also elevated with AST 162 units/L, ALT 62 units/L, alkaline phosphatase 238 units/L, and total bilirubin 4.7 mg/dL. CT abdomen/pelvis showed sigmoid thickening, innumerable hepatic hypodensities, portal vein thrombosis and lymphadenopathy concerning for metastatic primary colon cancer. Liver biopsy was performed for tissue diagnosis and culture due to concern for pyogenic abscess, and showed polymicrobial gut flora with no malignant cells. Blood and liver aspirate cultures grew Escherichia coli and Streptococcus anginosus within 48 hours. He underwent exploratory laparotomy with sigmoidectomy and end colostomy. Intraoperative findings were consistent with severe, perforated diverticulitis; no masses concerning for malignancy were found.

Discussion: While multiple hypoechoic liver lesions are always concerning for metastatic disease, this case highlights the importance of entertaining a broad differential. Hypoechoic liver lesions may be representative of solid or cystic lesions. Cystic liver lesions may represent pyogenic abscess, hydatid cyst, hemangioma, focal nodular hyperplasia, cystadenoma, and neoplasm. Pyogenic liver abscesses most often arise in the setting of biliary tract disease or obstruction, but can also be caused by bowel leakage due to perforated diverticula or ulcerated colonic tumor or peritonitis causing gut bacteria translocation into the portal venous system. Diverticulitis, particularly of the sigmoid colon, is a rare but recognized cause of pyogenic liver abscesses, and should be considered in all patients with hypoechoic hepatic lesions of uncertain origin.

Presentation #109

Title: Acute Calculous Candidal Cholecystitis in a Patient with Metastatic Colorectal Cancer who was not a Surgical Candidate

Presenter: Tom Phan

Authors: Tom Phan, MD; Shailavi Jain, Timothy J. Brown, MD

Faculty Mentor: Timothy J. Brown

Abstract

Case Presentation: A 37-year-old man with metastatic colorectal cancer status post right hemicolectomy and chemotherapy presented with constant, severe, non-radiating, acute epigastric and right upper quadrant abdominal pain. He had acute calculous cholecystitis based on CT of the abdomen/pelvis with contrast in the emergency department and subsequent abdominal ultrasound. Empiric antibiotics were started, but the patient was not a surgical candidate. The patient's symptoms, leukocytosis, and liver enzymes improved after placement of a cholecystotomy tube. However, cultures of the cholecystotomy fluid grew Candida albicans, an unusual cause of cholecystitis. The patient had three of the four major risk factors for fungal cholecystitis: immunosuppression, underlying malignancy, and previous abdominal surgery. He was started on fluconazole, which is the first line treatment for fungal cholecystitis. At six-week follow-up with surgery, the patient was asymptomatic and will follow- up with Interventional Radiology for tube study and capping trials.

Discussion: The literature on acute fungal cholecystitis is limited, with case reports first appearing in the 1970s discussing risk factors for developing fungal cholecystitis. The risk factors were first presumed to include complicated abdominal surgery. Later cases included immunocompromised state, advanced diabetes mellitus and underlying malignancy as additional risk factors for fungal cholecystitis. Candidial cholecystitis is associated with a high mortality risk in patient's admitted to ICU-level care. Current guidelines for initial treatment of any patient with acute cholecystitis involves initiating empiric antibiotics for an anticipated bacterial infection caused by gram-negative organisms. Given that Candida is a rather uncommon cause of cholecystitis, it should be considered mainly in patients not responding to antibiotics with previously stated risk factors. In the patient presented in this case, who had three of four major risk factors, Candida was successfully treated with cholecystostomy tube placement and fluconazole. Evidence, however, does not suggest empiric use of antifungals until after organism isolation, even in intensive care settings. More work is needed to determine relative risks of these four major risk factors, and the incidence of fungal cholecystitis, as it has been suggested by these four major risk factors, and the incidence of fungal cholecystitis, as it has been suggested that the incidence of fungal cholecystitis may be rising as the prevalence of risk factors such as immunosuppression or diabetes continues to increase.