The Warren Alpert Medical School of Brown University Annual Research Forum

Warren Alpert Medical School of Brown University Annual Research Forum: Resident Project Winners

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Abstract

Resident project winners at the Warren Alpert Medical School of Brown University annual research forum

ANURAG GOEL: INCREASED RISK OF CARDIOVASCULAR EVENTS IN YOUNG ADULTS WITH PSORIASIS AND PSORIATIC ARTHRITIS IN AN INPATIENT DATABASE

Introduction: Psoriasis (PsO) and psoriatic arthritis (PsA) are linked to increased cardiovascular disease (CVD) risk in children, yet their role in severe atherosclerotic CVD (ASCVD) events in transition-age young adults remain unexplored. In older adults, systemic inflammation from PsO and PsA accelerates atherosclerosis, contributing to these ASCVD events such as acute coronary syndrome, heart failure, stroke, and cardiovascular death. While these are demonstrated in older adults, no studies have assessed the burden of non-fatal ASCVD events in young adults with PsO and PsA. **Methods**: We used data from the National Inpatient Sample database between 2016-2019 and identified 1,406,913 records for patients aged 18-24, of which 13,412 were admissions for a non-fatal ASCVD event. We performed a cluster analysis to identify groups of patients with similar demographics and comorbidities. We used regression analysis to test the hypothesis that inflammation-driven atherosclerosis from PsO and PsA causes early ASCVD events beyond what can be explained by other risk factors. **Results**: Cluster analysis identified three distinct demographic groups as follows: Group 1) predominantly urban-dwelling higher-income patients of non-White or Black race/ethnicity with type 2 diabetes mellitus (T2DM) and obesity; Group 2) predominantly patients of White or Black race/ethnicity with type 1 diabetes mellitus (T1DM), hypertension (HTN), and hyperlipidemia (HLD); and Group 3) predominantly patients of White or Black race/ethnicity without a significant burden of traditional CVD risk factors. Across the groups, 1,713 patients had psoriatic disease. In all three groups, transition-age patients with PsO or PsA were more likely to be admitted for a non-fatal ASCVD event including heart failure, stroke, and acute coronary syndrome (Group 1 OR 1.72, $p < 0.0001$; Group 2 OR 3.17, $p < 0.0001$; Group 3 OR 1.20, $p = 0.0033$). **Conclusion**: Young adults with PsO and PsA face a significantly higher risk of severe ASCVD events, even after adjusting for traditional risk factors, baseline health, and social vulnerability. These data are consistent with our hypothesis that accelerated atherosclerosis from systemic inflammation in PsO and PsA causes early ASCVD events in transition-age young. Current guidelines do not recommend increased ASCVD screening for young patients with systemic inflammatory conditions, and further research is needed into developing preventive cardiology strategies for patients with PsO and PsA in this high-risk age group.

YASMEEN MOHAMMAD: AT A LOSS FOR WORDS: RESPONDING TO PATIENT INITIATED DISCRIMINATION AND HARASSMENT

Introduction: Creating a safe and respectful environment for healthcare providers promotes education, wellness and excellent patient care. Most healthcare training teaches students to recognize their own biases and treat all patients with respect and kindness. However, following employment, many providers recognize that their training failed to equip them to respond appropriately to patient-initiated discrimination and harassment (PIDH). There is limited literature regarding educational interventions aimed at teaching providers how to respond to dis-

crimination and harassment. **Methods**: An hour-long workshop was offered to a group of internal medicine trainees during a scheduled daily didactic period. Participants were asked to complete a pre- and post-survey at the beginning and conclusion of an interactive case-based workshop. Self-reported responses were assessed with a 4-point scale (poor, fair, good, very good) and categorized into "good or very good" versus "poor or fair". McNemar's test for association of paired counts was performed to determine if differences in data reached statistical significance. **Results**: Of the approximately 40 trainees that participated in the workshop, a total of 33 trainees completed the pre- and post-survey. Participant demographics were as follows: females 42.9%, males 54.3%, and transgender 2.8%; White/Non-Hispanic 60.6%, Asian 30.3%, Black 9.1%. A total of 74.4% of participants reported experiencing PIDH and 84.6% reported witnessing PIDH directed at another provider. Qualitative responses were gathered regarding the nature of the PIDH, which included gender, race, religion, physical appearance, age, and sexual orientation. Among participants, 70.3% reported never having received training to respond to PIDH prior to the workshop. The proportion of participants who rated their ability as "good or very good" to recognize PIDH increased from 71.8% before to 94.7% after the workshop ($p<0.001$, OR 2.6, 95% CI [1.6-4.1]). The proportion of participants who rated their ability as "good or very good" to respond to PIDH directed at themselves increased from 18.0% before to 79.0% after the workshop ($p<0.001$, OR 4.54, 95% CI [2.7-8.3]). The proportion of participants who rated their ability as "good or very good" to respond to PIDH directed towards another provider increased from 71.8% before to 81.6% after the workshop ($p<0.001$, OR 2.6, 95% CI [1.6-4.1]). **Conclusion**: Most internal medicine trainees participating in this workshop at a single institution have experienced or witnessed some form of PIDH. The workshop improved participants' self-rating abilities to recognize and respond to PIDH directed at them or a colleague. With funding and institutional support, these skills could be assessed objectively through observed encounters with standardized patients that are integrated into existing medical curriculum and residency orientation simulations. As diversity in healthcare increases exponentially, similar workshops and initiatives should be tested at other institutions, including multiple levels of medical education. Ultimately, these initiatives will empower all members of interdisciplinary teams to navigate challenging experiences related to PIDH.

JESSICA BRAR: RACIAL DIFFERENCES IN MEDICATIONS FOR OPIOID USE DISORDER INITIATION IN A CARCERAL SETTING

Background: The opioid overdose crisis significantly affects marginalized communities, with people of color experiencing higher rates of overdose and barriers to treatment. The syndemic of opioid use disorder and mass incarceration exacerbates racial health disparities. Some carceral facilities offer medication for addiction treatment, though no significant research explores differences in type of treatment uptake by race in these settings. This study focuses on the racial differences in medications for opioid use disorder (MOUD) preferences among incarcerated individuals. **Methods**: A retrospective cohort study was conducted at the Rhode Island Department of Corrections (RIDOC), examining MOUD-type preferences (buprenorphine or methadone) among incarcerated individuals. The study utilized RIDOC electronic medical records from January 1, 2017 to December 31, 2022, involving 3533 unique incarceration events. Participants were categorized by race (White vs non-White) and MOUD status (new initiation vs community continuation), with logistic regression models. **Results**: The study found no direct racial disparity in preferences for MOUD type. However, an interaction between race and MOUD initiation status significantly influenced MOUD-type preference. Among those initiating MOUD during incarceration, non-White individuals were more likely to choose buprenorphine compared to their White counterparts. **Conclusion**: This research provides new insights into the intersection of race, incarceration, and MOUD preferences. While direct racial disparities in MOUD type were not observed, the analysis uncovered a notable interaction effect: race influences the relationship between MOUD initiation status and the selected MOUD treatment during incarceration. Specifically, data demonstrate that the likelihood of choosing buprenorphine varies significantly based on both racial background and whether the treatment was initiated during incarceration or in the community. Further research is needed in different geographic settings to understand the broader implications to help guide equitable healthcare delivery in jails and prisons.

EDWARD RICHARDSON: NEURALACS: A NEURAL NETWORK FOR THE RAPID ANALYSIS OF EKGS TO PREDICT CARDIAC CATHETERIZATION OUTCOMES

Introduction: Acute coronary syndrome (ACS) describes rapid occlusion of coronary vessels causing myocardial tissue damage detected by cardiac biomarkers and the electrocardiogram (EKG). EKG features dictate the urgency of invasive diagnostic assessment via cardiac

catheterization, where vascular lesions can be identified to direct percutaneous coronary intervention and re-perfuse affected myocardium. While patients with ST-elevation myocardial infarction (STEMI) undergo emergent cardiac catheterization, patients non-ST-elevation myocardial infarction (NSTEMI) await delayed cardiac catheterization. A proportion of NSTEMIs represent acute total occlusion myocardial infarctions that might also benefit from an emergent diagnostic evaluation. Our current framework for EKG analysis has limited sensitivity for acute total occlusions despite decades of refinement. Automated intelligence (AI) may augment medical practice, and neural networks are a form of AI for outcome-based analysis. We are developing a neural network to rapidly analyze EKG waveform data corresponding to outcomes of cardiac catheterization to predict the likelihood of intervenable lesions and forecast the anatomical location of said lesions. This is the first of its kind study in its approach to the format of EKG data, its linkage to cardiac catheterization outcomes, and the numerical codification of angiographic coronary anatomy. We believe this tool will meaningfully aid in the triage of patients with ACS, especially without overt evidence of transmural ischemia on presentation. **Methods**: Patients who underwent cardiac catheterization at Brown University Health between April 2018 and September 2023 were included (21,465 patients). EKG data was exported in XML format from the Philips ISECG Intellispace Application. We are refining code to transform XML data via continuous wavelet transformation, which we believe will favorably impact analysis. Cardiac catheterizations are all manually reviewed and codified into a 26-column matrix representing lesions in coronary anatomy, sites of intervention, and referral for coronary artery bypass grafting. Neural network construction is ongoing by linking transformed EKG waveform data with the correspondent 26-column matrix representing the cardiac catheterization. **Results**: 520 patients from July 2023 to September 2023 were selected for an initial analysis: 153 with normal coronary arteries or mild non-occlusive coronary artery disease; 41 patients with moderate non-occlusive coronary artery disease; 109 patients with severe coronary artery disease; 217 patients with acute coronary syndrome, including unstable angina (45), NSTEMI (127), and STEMI (45). Of these 520 patients, 278 (53%) underwent intervention (DES or CABG). Further data collection is ongoing for subsequent training and validation of the neural network. **Conclusion**: Neural network development in clinical contexts presents significant obstacles, as the protected nature of patient data restricts software utilization and limits data formats. Significant modification of clinical data is required to strengthen predictive capacity. We will continue both data collection and code development with plans to report neural network performance in the upcoming month.

CYNTHIA ZHENG: PROCEDURE TRAINING WORKSHOP: ENHANCING RESIDENT EXPERIENCE AND ENTHUSIASM FOR ULTRASOUND-GUIDED BEDSIDE PROCEDURES

Introduction: ACGME requirements state that residents must be able to perform all procedures that are considered "essential for the area of practice" including point-of-care studies. However, the amount of training and level of comfort among trainees varies widely regarding bedside procedures, which was mirrored in an internal survey at this residency program. One factor contributing to this variability was a lack of formal curriculum. In addition, consulting services cannot accommodate the volume of procedures in a timely manner. As such, a procedure workshop was designed to address this gap in resident education. **Methods**: All PGY-1 and PGY-2 residents were assigned to attend a half-day procedure training workshop (PTW) at a simulation center. A flipped classroom model was used where residents received slides and videos to review before arrival. With a maximum 2:1 resident-to-instructor ratio, residents practiced paracenteses, lumbar punctures (LPs), and central venous catheter (CVC) placement on ultrasound-compatible task trainers. To evaluate the efficacy of the PTW, knowledge and self-reported confidence were evaluated through multiple-choice questions and survey questions administered before and after participation. The number of bedside procedures and other variables such as success rate and immediate procedural complications were tracked through required documentation and compared among 2020, 2021, and 2024. **Results**: Following implementation of the PTW, more residents reported feeling "well-prepared" to perform or "teach others" all procedures after participation compared to before (69% from 31% for CVC, 71% from 8% for lumbar punctures, 80% from 28% for paracentesis). Similarly, more residents felt they could perform all steps without assistance (54% from 28% for CVC, 49% from 17% for LP, 66% from 25% for paracentesis). When comparing the number of procedures, there were increases in paracenteses and LPs from 2020 to 2021, which sustained through 2024 (71 to 119 to 143 for paracentesis, 87 to 156 to 135 for LPs). Notably the number of CVCs decreased since 2020 (515 to 418 to 277), likely attributable to the Covid pandemic. There were also similar success rates across the procedures (91.5% to 94.1% to 93.7% for paracentesis, 58.6% to 55.8% to 52.6% for LPs, 95.5% to 97.6% to 94.9% for CVCs). There was a slight decrease in the success rates of LPs from 2020 to 2024, likely due to the inherent difficulty of the procedure. This suggests that more repetitions per resident are needed to achieve a stable success rate. **Conclusion**: The PTW is a valuable half-day session for early residents, providing both the necessary proce-

dural knowledge and the opportunity to practice the tactile skills. Key factors in maintaining the educational quality include ensuring a low learner-to-instructor ratio, standardizing instructions, and securing adequate administrative support. Residents found the session enjoyable and were able to successfully apply these skills in the clinical setting.

NEHA WADHAVKAR: THE IMPACT OF RACIAL, GENDER, AND SOCIOECONOMIC DISPARITIES ON TREAT-TO-TARGET GOALS AMONG PATIENTS WITH INFLAMMATORY BOWEL DISEASE

Introduction: Inflammatory bowel disease (IBD) is a chronic illness affecting millions worldwide and requires close monitoring. Recent 2021 Selecting Therapeutic Targets in Inflammatory Bowel Disease (STRIDE-II) guidelines highlight the importance of treat-to-target goals following treatment change, including endoscopic healing within 9 months. Given the limited existing literature, we explored characteristics and disparities that influence compliance with these recommendations among IBD patients. **Methods**: We conducted a retrospective review of 423 adult patients with IBD, either Crohn's disease (CD) or ulcerative colitis (UC), at two academic clinics in Rhode Island from 2020 to 2023 who had a change in therapy based on clinical symptoms, lab work, imaging (CT or MRI), and/or endoscopic evaluation. 136 patients met inclusion criteria. Patients were followed for 9 months after the treatment change and were evaluated on compliance with lab work, imaging, and colonoscopy. We compared demographic (race, gender, age), socioeconomic [insurance, area deprivation index (ADI)], and medical [Charlson comorbidity index (CCI), psychiatric diagnoses] factors related to compliance with STRIDE-II guidelines. Chi-square, Fisher exact test, and Student's t-tests were performed for descriptive analyses. A multivariable Cox Hazard regression model was used to compare outcomes by demographics, adjusted for gender, age, race, language, marital status, insurance, housing instability, ADI, BMI, IBD type, substance use, CCI, and psychiatric diagnoses. Analysis was performed in SAS version 9.4. **Results**: Among 136 patients, 54% had CD and 46% had UC, with the majority being Caucasian (75%) and males (57%). Mean age was 37.9±15.6, mean BMI was 27.2±5.8, mean CCI was 1.2±1.9, 35% had generalized anxiety disorder (GAD), and 19% lived in a highly deprived area (ADI>7). Hispanic/Latino patients were 94% less likely to meet guidelines and undergo colonoscopy within 9 months (25% vs 43%, HR 0.06[0.02-0.22]). Patients aged 18-30 had 63% lower odds of compliance (31% vs 42%, HR 0.37[0.15-0.95]). White patients were nearly four times more likely to meet guidelines (43% vs 28%, HR 3.9[1.4-11.1]), females were three times more likely to meet guidelines (45% vs 33%, HR 3.1[1.4-6.8]), and patients with GAD were over four times more likely to meet guidelines (49% vs 33%, HR 4.5[1.6-12.3]). **Conclusion**: To our knowledge, our study is the first to explore disparities related to compliance with STRIDE-II guidelines. We found significantly decreased compliance with treat-to-target goals among Hispanic/Latino, younger, and male patients. Understanding socioeconomic and cultural barriers that these specific patient populations face may allow us to direct resources towards improving counseling, access, and care to optimize long-term outcomes and minimize complications among those with IBD.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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