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Winners - 2022 Maryland ACP Mulholland Mohler Residents Meeting

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Maryland ACP Mulholland Mohler winning resident abstracts 2022

MARYLAND ACP MULHOLLAND MOHLER WINNING RESIDENT ABSTRACTS 2022

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1st Place Oral Research Winner - Cognitive Heuristic Availability Bias in the Emergency Room?

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Background: A previous study found that 3% of emergency room (ED) physicians are responsible for ordering a large portion (32%) of computer tomography pulmonary angiography (CTPA) scans for evaluation of pulmonary embolisms (PE) with a low positive scan rate (PSR) of 5.5%. We hypothesized that this high rate of scan ordering may be due to availability bias.

Purpose for study/Hypothesis: To evaluate if the number of CTPA ordering is associated with availability bias.

Methods: This was a multisite medical system retrospective cohort study. All CTPAs ordered by ED attending's at MedStar Health in 2017 were included in the analysis. There is no positive scan in the 30-day run-in period before Day 0. Total count of orders at Day 15 and Day 30 were collected. Each physician has one observation period in each quarter. The inclusion criteria include: 1) ED physicians who had ordered ≥ 30 CTPAs in 2017; 2) 30 days of subsequent data should be available. We categorized the physicians into 1) high-utilizers (the top 30% of physicians ordered the most scans); 2) low-utilizers (the remainders); and 3) high-utilizers with low PSR (PSR < 15%). Linear regression was utilized to assess the difference of percentages of CTPAs ordered after a positive scan between the two groups. We considered a two-tailed p value of below 0.05 as statistically significant.

Results: There was no significant difference of number of CTPA orders among ED physicians in general or comparing the high-utilizers and low-utilizers on the ordering rates following a positive scan. However, on average the high-utilizers with low PSR ordered more than double number of scans when comparing the low-utilizers (18 vs. 8.5) in year 2017. Among those scans, 59.2% were ordered after a positive scan, while only 45% were ordered after a positive scan among other ED doctors. This 14% difference is significant ($p=0.025$).

Discussion/Conclusion: Our data showed that the high-utilizers, especially those with low PSR, ordered significantly more CTPAs after a positive scan. A study conducted in California also found a 15% increase in physician ordering after a positive scan. Our study supports our hypothesis that high utilizers with low PSR are more subject to

availability bias than their colleagues. The limitations include we have no knowledge on how the pretest protocols were employed consistently and whether a patient had a recent PE diagnosis. Further studies could be done to determine the role of availability bias in decision making and explore interventions to eliminate this bias.

1st Place Research Poster Winner - Coronary Artery Calcium Scores Among Older Adults with Diabetes and their Relationship with Diabetes-Specific Risk Enhancers – the Atherosclerosis Risk in Communities (ARIC) Study

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Objective: To examine the distribution of coronary artery calcium (CAC) scores, among older adults with diabetes and their association with diabetes specific risk enhancers.

Methods: We conducted a cross-sectional analysis of 422 coronary heart disease (CHD)-free participants with diabetes, aged ≥ 75 years who had CAC scans at visit 7 (2018-2019) of the Atherosclerosis Risk in Communities (ARIC) study. CAC distribution was reported by sex, and multivariable-adjusted logistic regression models were used to estimate the association between diabetes risk enhancers [duration of diabetes (≥ 10 years vs <10yrs); albuminuria (≥ 30 mcg vs <30mcg); eGFR (<60mL/min/1.73m² vs >60mL/min/1.73m²); retinopathy (present vs absent); neuropathy (present vs absent); Ankle-brachial index (<0.9 vs ≥ 0.9)] and CAC, adjusting for age, sex, race, education level, dyslipidemia, hypertension, physical activity, smoking status, and family history of CHD.

Results: A total of 422 participants (mean age:79.9 [SD:3.97] years, 56.6% female, 62.1% White) were studied. 94.6% participants had CAC>0, and the distribution of CAC scores was heterogeneous across sex strata. We noted a graded increase in median CAC score with increasing number of diabetes risk enhancers, especially in males. Individuals with ≥ 2 diabetes risk enhancers had greater odds of elevated CAC compared to those with <2 (OR 2.00 [1.18,3.39]).

Conclusion: The distribution of CAC remains heterogeneous even among older adults with diabetes and is strongly associated with the number of diabetes risk enhancers present. This has possible value for risk stratification and may guide intensity/de-escalation of statins in this population.

1st Place Oral Clinical Vignette Winner - Raccoon Eyes may Indicate Lethal AL Amyloidosis

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Introduction: Although ‘raccoon eyes’ is a well-known manifestation of amyloidosis; it is only present in a minority of patients. Studies have shown that patients have non-specific symptoms, such as fatigue, but those with primary cardiac involvement are more likely to have a delay in diagnosis as compared to those with primary kidney involvement. Delays in diagnosis have a significant effect on prognosis.

Case: A 65-year-old male presented with random bruising in the upper chest and around the eyes for one and a half years. Physical examination was unremarkable except for neck ecchymoses. Work up for bleeding diathesis including PT/INR/PTT, fibrinogen, factor VIII, factor XIII and Von Willebrand testing was unremarkable. Serum electrophoresis showed an M spike, serum kappa light chain level was 22mg/L, serum lambda light chain level was 344 mg/dl and a kappa to lambda ratio was 0.06. 24-hour urine Bence-Jones protein was 205 mg/day, urine immunofixation showed monoclonal free lambda light chain. Factor X activity was 42%. Bone marrow biopsy showed 10% plasma cells, Congo red stain was positive for amyloid protein, (11:14) translocation was positive. NT-proBNP was 1503 pg/ml. Strain echocardiogram showed left ventricular hypertrophy, ejection fraction 65-70%, and 57% strain. Cardiac magnetic resonance imaging showed concentric left ventricular hypertrophy and diffuse right and left ventricle subendocardial late gadolinium enhancement consistent with cardiac amyloidosis. He was started on systemic therapy with a regimen of daratumumab, cyclophosphamide, bortezomib and dexamethasone. After one cycle of therapy, lambda light chain levels normalized, and he had improvement in bruising. He continues to receive systemic therapy in conjunction with cardiology follow up.

Discussion: Light-chain (AL) amyloidosis is a lethal form of systemic amyloidosis arising from clonal expansion of CD38+ plasma cells. Organ damage occurs when these plasma cells produce misfolded immunoglobulin light chains, which form amyloid fibrils and are deposited in tissues. A minority of AL amyloidosis patients display ‘raccoon eyes’ caused by increased vascular fragility, a side effect of amyloid fibril accumulation. Amyloidosis can be directly associated with a bleeding diathesis due to factor X deficiency since factor X binds to amyloid fibrils primarily in the liver and spleen. Other important pathogenetic factors in AL amyloidosis include acquired hemostatic abnormalities, coagulation factor deficiencies, hyperfibrinolysis, and platelet dysfunction. Diagnostic delays for patients with cardiac involvement is detrimental as the median survival rate among these patients without treatment is approximately 6 months after the onset of symptoms but timely treatment can prevent organ damage.

1st Place Clinical Vignette Poster Winner - Propafenone: Pocket-Pill or Poison?

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Propafenone is a class IC antiarrhythmic drug used for the treatment of supraventricular tachycardia. It can be used as a “pill-in-pocket” approach or as daily maintenance therapy to maintain sinus rhythm in patients with atrial fibrillation (AF). Herein, we discuss a case of propafenone toxicity in an older adult despite therapeutic drug level. This case is the first to report propafenone toxicity within the accepted therapeutic range.

An 87-year-old woman with a history of AF and chronic kidney disease stage IV was brought into the emergency department after being found unresponsive. She was diaphoretic, bradypneic with a respiratory rate of eight breaths per minute, and hypoxic with an oxygen saturation level of 80% requiring 12L via nonrebreather mask. Other vital signs were stable. Laboratory data was remarkable for serum creatinine of 2.9 mg/dL, consistent with her baseline. Electrocardiogram showed AF and new wide QRS complexes (162 milliseconds) with a left bundle morphology. Since the patient was on propafenone 150 mg three times daily with impaired renal function, suspicion for propafenone toxicity was raised. Propafenone was discontinued immediately, and a level was sent nine hours after her last dose. The Poison Control Center was contacted, and she was started on a continuous infusion of sodium bicarbonate. Within four hours of initiation of sodium bicarbonate infusion, there was narrowing of the QRS complexes to baseline and resolution of altered mental status. The propafenone level returned one week later at 0.96 mcg/ml (therapeutic range 0.5-2.0 mcg/ml).

Propafenone toxicity is an elusive diagnosis that most commonly presents with cardiac manifestations including widened QRS complexes, dysrhythmias, hypotension, bradycardia or heart block. In the geriatric population, it has been documented to affect the central nervous system leading to alteration in mental status or behavioral changes. Cases of toxicity have been documented with doses ranging from 625 mg daily up to 8.1 g in one ingestion. Current case reports of toxicity only include patients with supratherapeutic levels; our patient presented with signs and symptoms of propafenone toxicity despite having a level on the lower end of the therapeutic range. This case highlights that propafenone toxicity can manifest even at levels traditionally considered within the normal therapeutic range and at total daily doses as low as 450 mg daily. This case also highlights the need for judicious prescription of propafenone and other class IC antiarrhythmics in the geriatric population.

1st Place Chief resident Award Poster Clinical Vignette Winner - In Cardiac Dis-Dress: A Rare Case of DRESS-associated Acute Necrotizing Eosinophilic Myocarditis

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DRESS syndrome is a delayed type IV hypersensitivity and multi-system reaction to a drug. It is characterized by a skin rash, fever and organ involvement usually 2-3 weeks after initiation of an inciting medication. Acute Necrotizing Eosinophilic Myocarditis (ANEM) as a sequelae of DRESS is rare, and late recognition of this important finding can be fatal.

We present a case of a 37-year-old female with a past medical history of DRESS due to Sulfasalazine and Psoriatic Arthritis who presents with intermittent left-sided chest pain radiating to the left shoulder alleviated by leaning forward, worsened by recumbency, as well as worsening dyspnea and lower extremity edema. Three weeks prior to this presentation, the patient was diagnosed with DRESS syndrome due to Sulfasalazine and discharged on Cyclosporine and a month-long Prednisone taper. Physical exam showed JVP to the mandible and lower extremity edema. Labs were notable for troponin and Pro-BNP elevation. A transthoracic echo (TTE) showed biventricular failure and reduced left ventricular ejection fraction (LVEF) of 20-25%, with a moderate pericardial effusion. She was diuresed with IV Furosemide, continued on Cyclosporine and started on high dose steroids. We obtained a cardiac MRI and cardiac biopsy which were diagnostic for ANEM. A right heart catheterization (RHC) showed elevated right- and left-sided pressures and a cardiac index of 1.28 L/min/m², thus spurring dobutamine-assisted diuresis. However, the patient continued to show signs of progressive cardiogenic shock with

worsening hemodynamic values on RHC, necessitating IABP placement and subsequent VA-ECMO cannulization. With improvement in her hemodynamics, she was decannulated off VA-ECMO and weaned off of dobutamine-assisted diuresis. Repeat TTE showed LVEF recovery to 40%, with continued mild global hypokinesis. On discharge, we prescribed a prolonged prednisone taper, continued Cyclosporine and initiated guideline directed medical therapy for heart failure.

ANEM is a serious sequelae of DRESS syndrome with high rates of morbidity and mortality. Early recognition is key, and fatal progression can be the consequence of delayed treatment. As demonstrated by this case, patients with DRESS syndrome should be monitored and screened early for cardiac involvement. Treatment should involve prompt initiation of immunosuppressants and multidisciplinary care is important for a successful outcome.