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MFM Provider Adherence to USPSTF Low Dose Aspirin Guidelines for Preeclampsia Prevention in Nulliparous Patients*

Sabrena O. Myers[1], Sabrena O. Myers[1], Shauntell Luke[1], Khaila Ramey-Collier[1], Tracy Truong[1], Kristin Weaver[1], Geeta Swamy[1] and Sarahn Wheeler[1]
[1]Duke University

OBJECTIVES/GOALS: Recent studies suggest nulliparous patients benefit from low dose aspirin (LDA), yet there are limited studies examining MFM providers adherence to USPSTF guidelines and predictors of adherence. We identified demographic, obstetric, and clinical characteristics associated with guideline concordant counseling on LDA in nulliparous women. METHODS/STUDY POPULATION: Retrospective cohort study of pregnant nulliparous patients who received MFM prenatal care at a single tertiary center (1/1/2019-6/30/2020). Multiple gestations, > 2 spontaneous or therapeutic abortions, and contraindications to LDA were excluded. Maternal demographic and clinical characteristics were abstracted from the electronic medical record. The primary outcome was documented LDA counseling based on USPSTF guidelines. Data were analyzed using bivariate analysis and logistic regression using R 4.1.0 (R Core Team, 2021). RESULTS/ANTICIPATED RESULTS: Among 394 records in the analysis cohort, 316 met USPSTF guidelines for LDA. 164 (51.9%) meeting guidelines had documented LDA counseling. 67.4% of individuals with ?1 major USPSTF risk factors were counseled and 50.7% with ?2 moderate risk factors were counseled (Table 1). Age at the estimated due date (EDD), Black or Other race, chronic hypertension, and obesity are significantly associated with higher odds of aspirin counseling (Table 2). Patients with chronic hypertension had 4.15 higher odds of receiving low dose aspirin counseling compared to non-hypertensive patient (Table 2). DISCUSSION/SIGNIFICANCE: Our results suggest that only 51.9% of patients eligible for LDA received counseling despite MFM care. Increasing MFM provider awareness about the USPSTF guidelines and creating tools that facilitate guideline concordant counseling may increase the number of eligible patients who are counseled about LDA.

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The mediating role of bonding on pandemic maternal stress and child behavioral outcomes†

Polaris Gonzalez-Barrios[1], Sohye Kim[2], Sona Rivas Tumanyan[3], Carmen J. BuxÃ³ Martinez[4] and Karen G. Martinez-Gonzalez[5]
[1]Department of Psychiatry, UPR Medical Sciences Campus, [2]Attachment and neurobiology researcher; Assistant Professor Eunice Kennedy Shriver Center, Departments of Psychiatry, Pediatrics, and Obstetrics and Gynecology, University of Massachusetts Medical School, [3]Associate Professor Office of Assistant Dean for Research and Department of Surgical Sciences, Biostatistics, Epidemiology and Research Design (BERD) Core Leader, The Hispanic Alliance for Clinical and Translational Research (Alliance), [4]Associate Professor/Director, Dental and CraniofacialÂ Genomics Core (DCGC)/Director, Caribbean Dental BiorepositoryÂ (CariDen), School of Dental Medicine and [5]PI Post Doctoral Masters in Science of Clinical Research/Director Department of Psychiatry UPR-Medical Sciences Campus/Director Center for the Study of Fear and Anxiety

OBJECTIVES/GOALS: The COVID-19 pandemic may have affected the relationship/experience of the mother-child dyad (Provenzi et al., 2021). Our objective is to identify the association of pandemic related maternal stress with child development. We will further evaluate the role of bonding, attachment, and trauma on this association. METHODS/STUDY POPULATION: We aim to recall a prospective cohort (n=200) of Latinx/Hispanic mothers from an ongoing study, power analysis will estimate minimum sample size (power=0.80 and alpha =0.05). Assessments of pandemic related maternal stress (PRMS) will be done with the COVID-19 and Perinatal Experiences Interview, perceived stress scale, and Parental Stress Index. Bonding, attachment, and trauma history will be assessed with psychological questionnaires and Childs behaviors with the Ackerman-CBCL questionnaire. Descriptive statistical analysis will be done. Correlations will identify associations and multivariate models will assess the role of parental bonding and effects of maternal attachment/trauma on associations to PRMS and child behavioral outcomes (controlling for confounding effects). RESULTS/ANTICIPATED RESULTS: First, we expect to find that mothers will report higher levels of stress (pandemic related, perceived, and parental) which will be associated with less bonding behaviors towards her child. Second, we expect that mothers levels of PRMS will be mediated by poorer bonding characteristics thus leading to negative child behavioral outcomes (i.e., poor regulation, crying spells, alterations in physiological patterns, and social-emotional developmental outcomes). Further mothers insecure attachment traits and trauma history will moderate perception of stress and negative child behavioral outcomes. DISCUSSION/SIGNIFICANCE: Results will describe stress in Latinx/Hispanics mothers during the pandemic and effects on child development. Identifying the role of maternal bonding/attachment will point to how this formative relationship has transformed during the pandemic, providing knowledge of mother-child resiliency.

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Inflammatory Cytokines and Neurocognitive Functioning in Bipolar Patients across Mood Episodes

Sandra I. Ralat[1], Karen Martinez[1], Rosa J. Rodriguez[1], Yamil Gerena[1] and the Inflamed Mood Project Team[1]
[1]Medical Sciences Campus, University of Puerto Rico

OBJECTIVES/GOALS: Accumulating evidence supports the involvement of immune and inflammatory pathways in Bipolar Disorder (BD) pathophysiology. This pilot study aims to determine if altered peripheral IL-2, TNF-a, IL-4, IL-6, IL-10, IFN-y, IL-17A levels are associated with BD across mood episodes (euthymic, manic, depressive), and worsen neurocognitive function. METHODS/STUDY POPULATION: Twenty-eight participants (17 cases and 11 controls) were recruited. We assessed the clinical features and cytokine plasma levels of participants. Cytokines were measured using Flow Cytometry. All subjects were interviewed by a trained psychiatrist. Each participant was fasting before the blood sample was taken. Neuropsychological tests were used to measure verbal fluency, speed processing, working memory/attention, visuospatial skills, verbal learning, executive functions, and motor skills. Descriptive statistics were used to calculate the demographic characteristics of the sample. An independent-sample Kruskal-Wallis Test and Mann-Whitney Test were carried out using SPSS version 21. RESULTS/ANTICIPATED RESULTS: Serum biomarker concentration showed a decrease in levels of IL-4 (anti-inflammatory) in BD patients vs healthy controls ($p < .05$). There was a major concentration of IL-6 (pro-inflammatory) on bipolar patients vs controls ($p = .003$). When we analyze the results

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with the mood episodes, we found that patients with bipolar depression showed decreased levels of IL-4 (p = .046) and increase levels of IL-6 (p = .020) in comparison to the manic or euthymic episodes. In the neurocognitive tests, we found that the control participants had better performance in the working memory domain (p = .038) and also in the general performance (p = .036) in comparison to bipolar patients. We found also a positive significant correlation between IL-4 and verbal learning in the control sample (.829, p = .003). DISCUSSION/SIGNIFICANCE: The findings evidence a significant immune activation in bipolar patients, in particular during the depressive episode. Participants with BD have a decrease in the protective levels of IL-4 combined with high levels of IL-6 when compared to healthy controls. Worse neurocognitive functioning was found in bipolar patients.

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Retrospective Evaluation of Whole-Exome Sequencing in Puerto Ricans with Neurogenetic Complex Traits

Elinette Albino[1], Simon Carlo[2], Cristel Chapel-Crespo[3], Alberto Santiago-Cornier[4] and Carmen Buxo[5]

[1]School of Health Professions, Medical Sciences Campus, University of Puerto Rico, [2]Ponce Health Sciences University, Biochemistry Department and San Jorge Children & Women's Hospital, Genetic Section, [3]University Pediatric Hospital Dr. Antonio Ortiz, School of Medicine, University of Puerto Rico, [4]Ponce Health Sciences University, School of Public Health and San Jorge Children & Women's Hospital, Genetic Section and [5]University of Puerto Rico, Medical Sciences Campus, School of Dental Medicine, Dental and Craniofacial Genomics Core

OBJECTIVES/GOALS: Assess the diagnostic yield and test utilization of WES in patients having complex traits. We aim to evaluate the use of the first genetic approach for the identification of primary variants that contribute to neurogenetic disease etiology and influence onset and progression in Puerto Ricans. METHODS/STUDY POPULATION: Prospective cohort of 45 Puerto Rican probands (19 months - 36 years old) with complex neurogenetic traits that underwent WES (2019 - 2021). WES was performed, including copy number variant analysis and mitochondrial genome sequencing. We evaluated several factors possibly influencing the rate of WES diagnosis including early age, consanguinity, and family history of neurogenetic diseases. In addition, we only evaluated probands rather than dyads/trios and the clinical phenotypes. Descriptive analysis was performed, including a catalog of all variants reported. Multivariate analysis was performed to estimate the statistical association between variants and phenotypes reported and adjusting for potential confounders (age, sex, family history, income, health insurance and zip code). RESULTS/ANTICIPATED RESULTS: Auspiciously, positive pathogenic findings altered the clinical management in 29% of the probands in this study. A likely genetic diagnosis was achieved in 53% of the probands including pathogenic, likely pathogenic and variants of uncertain significance. Intronic variants, copy number variants detection and mitochondrial genome was included in WES methodology. Despite these facts, a 47% of the reported WES were negative, which deserve re-analysis potentially genotype based. Multivariate analysis is expected to adjust for potential confounders to establish a genotype-phenotype correlations in neurogenetic complex traits in this Puerto Rican admixed population. DISCUSSION/SIGNIFICANCE: Clinical WES offers an alternative approach for identification of variants in patients with complex traits. WES is also applicable in genetically heterogeneous individuals when specific genetic tests are not available or unsuccessful. Variants reported contribute to understand complex neurogenetic disease in underrepresented Puerto Ricans.

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Group Model Building to characterize the experiences of older adults with type 1 diabetes (T1D) with continuous glucose monitoring (CGM) therapy and uncover suboptimal response patterns

Anna R Kahkoska[1], John A. Batsis[1], Michael R. Kosorok[1], Elizabeth J. Mayer-Davis[1], Richard Pratley[2], Ruth Weinstock[3], Laura A. Young[1] and Kristen Hassmiller Lich[1]

[1]University of North Carolina at Chapel Hill, [2](Advent Health Orlando Translational Research Institute for Metabolism and Diabetes) and [3](SUNY Upstate)

OBJECTIVES/GOALS: As the number of older adults (â‰¥65 years) with T1D grows, there are limited data to guide care. In a six-month trial, CGM reduced hypoglycemia in older adults, yet there are challenges for widespread uptake. Our objective is to characterize older adults experiences with using CGM and define suboptimal responses signaling a need for resources or support. METHODS/STUDY POPULATION: The study will engage key stakeholders (i.e., older adults with T1D, caregivers [recruited as patient-caregiver dyads], and providers [endocrinologists, geriatricians, diabetes educators]) for a Group Model Building (GMB). GMB is a participatory approach to system dynamics in which participants share perceptions and experiences with a problem and collaboratively explore the system structure that shapes those trends. A series of 8 GMB workshops will be held with 3-8 participants. The final study n will be determined by thematic saturation. Workshops comprise 1) a questionnaire, 2) a GMB session, and 3) a focus group discussion. GMB will follow a replicable process to generate a model of the complex web of causal determinants affecting CGM-related experiences, including optimal and suboptimal CGM responses. RESULTS/ANTICIPATED RESULTS: To date, the study has enrolled 33 participants, including 28 older adults living with T1D and 5 caregivers (mean age = 74 years, range 67-83 years). Twenty-four patient participants will be active CGM users and 4 will be CGM non-users. The study will report on patient data capture from the questionnaire and EMR, including demographics, experiences, familiarity, and confidence surrounding CGM use; diabetes duration; insulin pump use; history of severe hypoglycemia. Analysis of aggregated data will generate causal loop diagrams that integrate pertinent theoretical frameworks, lived experiences, and CGM outcomes. Maps will be used to identify a set of suboptimal CGM responses (i.e., key outcome trajectories) that signal a need for action, with a diagram of factors that interact to produce each response. DISCUSSION/SIGNIFICANCE: Delivering CGM to older adults with T1D demands new approaches. This study will yield critical evidence to tailor support and resources for effective CGM use in older adults. Findings may be translated into suite of pragmatic interventions to bolster CGM use and matched to individual patients expected to benefit using a precision medicine framework.

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