



2023
12th Scientific Day
MAY 3



Population Health After Disasters:
Responses from the Scientific Community

PRHSJ
Puerto Rico Health Sciences Journal

ABSTRACT SUPPLEMENT



Editorial

WINDS, TREMORS AND EMERGING INFECTIONS: IMPLICATIONS TO PUERTO RICO'S POPULATION HEALTH

Over the last decade, Puerto Rico has experienced multiple natural disasters and health outbreaks, on top of a fragile infrastructure and an economic crisis, with major repercussions on Population Health. In 2016, Puerto Rico suffered an outbreak of Zika virus infection with more than 40,000 confirmed cases, with important implications in neurodevelopment in children (1). In 2017, the Island was devastated by two hurricanes, first Hurricane Irma, a category 5 Hurricane and two weeks later, on September 20, 2017, Hurricane María, a category 4 Hurricane that devastated the Island and possibly resulted in more than 4,000 deaths (2). In January 2020, Puerto Rico suffered a magnitude 6.4 earthquake and aftershocks, with important repercussions across the whole Island. In March 2020, Puerto Rico identified the first cases of COVID-19, joining the rest of the world in the pandemic, while still recovering from the previous and recent disasters. The most recent data shows that SARS-CoV-2 infection in Puerto Rico has resulted in 1,101,469 confirmed cases and 5823 deaths, resulting in a major burden to a fragile healthcare system (3).

From the aforementioned events, it is clear that natural disasters and emerging infections are important determinants of population health for Puerto Rico, setting the stage for the need to understand the repercussions in multiple domains to the health of our population. Pursuing this need, the Hispanic Alliance of Clinical and Translational Research, an IDeA Clinical and Translational Research Program, has identified as a priority, the need to support multidisciplinary and transdisciplinary research addressing the impact of these natural disasters and emerging infections. This Scientific Day is set as an initial step to review the important contributions of the scientific community to the study of health implications from these disasters, and to develop more robust research that will result in tailored and effective healthcare strategies and influence policymaking based on evidence.

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Abstracts*

MUSCULOSKELETAL & RHEUMATIC SYMPTOMATOLOGY AFTER COVID-19 VACCINATION REPORTED IN A PUERTO RICAN POPULATION

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PURPOSE: This study highlights the musculoskeletal and rheumatic symptomatology intensities experienced between the first and second doses of mRNA vaccines in the Puerto Rican population.

METHODS: A questionnaire assessing musculoskeletal & rheumatic variables after COVID-19 vaccination was provided at the Universidad Central del Caribe vaccination clinics and distributed via social media between July 2021 and October 2021. We performed bivariate analyses. This study is IRB approved.

RESULTS: Out of 247 participants, 143 identified as female and 104 as male. Ages ranged from 21-30 (42.1%), 31-60 (34.4%), and 61+ (23.5%). At least three to four days after the first dose, 57.3% had no musculoskeletal/rheumatic pain/stiffness during the day, 28.5% reported mild pain/stiffness, 12.6% moderate pain/stiffness, and 1.6% serious pain/stiffness. During the night: 60.2% reported having no pain, 24.8% mild pain, 12.6% moderate pain, and 2.4% serious pain. After the second dose, 47.3% of participants had no muscular/rheumatic pain/stiffness during the day, 27.3% had mild pain/stiffness, 21.1% had moderate pain/stiffness and 4.1% had serious pain/stiffness. During the night, 51.4% of participants reported having no pain/rigidity in muscles/joints, 24.9% reported mild pain, 19.2% moderate pain, and 4.5% severe pain. The second dose was significantly associated with increased moderately to severe pain during the day ($p=0.002051$) compared to the first dose and during the night ($p=0.015468$).

CONCLUSIONS: Data showed increased intensity in musculoskeletal/rheumatic symptomatology after the second dose. This data could be useful for vaccination administration guidelines and public health matters.

IRB approval number: 2021-22.

***Disclaimer:** All information contained in this document was published as provided by the Organizing Committee.



BURNOUT DURING SURGICAL RESIDENCY IN A HISPANIC POPULATION

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PURPOSE: Medical trainees are subject to significant stressors that adversely affect their work performance, quality of life, and patient care; increasing the risk of resident burnout. Despite extensive research efforts regarding medical resident burnout, literature regarding the prevalence of burnout in Hispanic surgical residents has not been evaluated. This study aims to assess burnout in the medical field by exploring burnout rates and psychiatric comorbidity among Hispanic surgical residents.

METHODS: A three-part cross-sectional survey was distributed to Hispanic surgical residents at the University of Puerto Rico Medical Science Campus. Residency programs included Orthopaedic surgery, urology, otolaryngology, general surgery, ophthalmology, obstetrics-gynecology, and maxillofacial surgery. The survey consisted of demographic information, the General Health Questionnaire-12 (GHQ-12), and the Maslach Burnout Inventory (MBI) questionnaire. Descriptive statistics and pairwise correlations were performed to compare groups and responses.

RESULTS: 85% of residents completed the questionnaire, with 64.2% meeting the criteria for burnout. The average age of residents was 30 years, and 37% were female. Residents reported working an average of 67.6 hours a week. 29.5% of residents reported significant psychiatric morbidity on the GHQ-12.

CONCLUSION: Burnout rates in Hispanic surgical residents were found to be higher compared to burnout rates in non-Hispanic physicians. Earlier stages of residency are associated with higher rates of burnout. In addition, increased work hours and sleep deprivation were associated with higher rates of burnout. However, no correlation was found between marital status, debt level, age, sex, and burnout rates. Psychiatric morbidity (GHQ-12 scale) was associated with higher burnout rates.

Funding: This research did not receive any specific grant from funding agencies.

IRB approval number: The study received approval from the University of Puerto Rico Medical Sciences Campus Institutional Review Board (IRB). IRB approval number: B0110221.



AFLIBERCEPT FOR THE TREATMENT OF MACULAR EDEMA SECONDARY TO IDIOPATHIC RETINAL VASCULITIS, ANEURYSMS, AND NEURORETINITIS SYNDROME

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PURPOSE: Report a case of idiopathic retinal vasculitis, aneurysms, and neuroretinitis (IRVAN) syndrome in a patient whose cystoid macular edema was successfully treated with aflibercept and pan-retinal photocoagulation.

METHODS: A retrospective case review presented.

RESULTS: A 56-year-old male was sent for consultation, after an intravitreal angiogram that revealed symmetric retinal ischemia for 360 degrees in both eyes. Fundus examination revealed an aneurysm, neuroretinitis, and occlusive vasculitis consistent with a diagnosis of IRVAN syndrome. OCT examination revealed cystoid macular edema (CME) of the left eye. Chest x-ray revealed minimal prominence of interstitial markings. The patient had a positive QuantiFERON Tb-Gold test, resolved with a one-year course of isoniazid and pyrimethamine. Further work-up for other infectious and autoimmune etiologies was negative. The initial treatment consisted of bilateral pan-retinal photocoagulation to the areas of peripheral ischemia, which was provided in a fragmented fashion over the course of eight months. Soon after the diagnosis, he received treatment with two intravitreal aflibercept (2 mg/0.5 mL) injections, one month apart, to the left eye. Subsequently, at four months following presentation, he developed CME in the right eye, which was treated with a single intravitreal aflibercept (2 mg/0.5 mL) injection. At his last follow-up visit, four years after initial presentation, the patient remained asymptomatic, with 20/20 visual acuity in both eyes, and no evidence of CME recurrence.

CONCLUSION: Our case suggests that aflibercept may serve as an adjuvant to the standard treatment with pan-retinal photocoagulation, especially in cases that present with associated macular edema.

Funding: No funding.

IRB/IACUC approval number: Exempt due to this is a case report that only describes the management.



EFFECT OF COMORBIDITIES IN RECURRENT AND LONG COVID-19 IN THE PUERTO RICAN POPULATION

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PURPOSE: The risk of infection with SARS-CoV-2 and developing COVID-19 increases in individuals with pre-existing chronic conditions. Digital clinical laboratory data offer an additional tool for identifying patients at higher risks of developing severe, prolonged, or recurring COVID-19.

METHODS: We interrogated a database of clinical laboratory results from Puerto Rico (N = 131,208 patients; 9,889 COVID-19-positive) to identify possible correlations between prior anomalous laboratory results from 15 blood tests and current COVID-19 status. We implemented classical statistical methods (Student t-test and Pearson correlation) and machine learning methods (Random Forest and Gradient Boosting Classifiers).

RESULTS: A positive correlation was observed between prolonged COVID-19 (infection for 30+ days) and high hemoglobin A1c. An additional positive correlation was observed between recurrent COVID-19 (tested positive twice with a negative result in between) and high alanine aminotransferase (ALT). These results confirm previously reported observations of increased COVID-19 severity in diabetic and patients with liver conditions in the Puerto Rican population.

CONCLUSION: These results underscore the importance of electronic health records and laboratory data in identifying segments of the population at risk of COVID-related complications.

Funding: This research was supported by RCMI grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health.

IRB approval number: This study was conducted under Research Protocol (No. A8610117), reviewed and approved by the Institutional Review Board (IRB) at the University of Puerto Rico, Medical Science Campus on 28 February 2022.



ANTIBIOTICS DISTURB IMMUNE AND MICROBIAL CELL INFILTRATION IN HPV+ OROPHARYNGEAL TUMORS

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PURPOSE: There is a considerable lack of information regarding the impact of the oral microbiota on intratumoral immune responses and prognosis, in head and neck squamous cell carcinomas (HNSCC). The goal of this study was to determine the immune and microbial responses in the tumor microenvironment, during anti-PD-1 therapy combined with antibiotics.

METHODS: We used a preclinical murine model where an HPV+ oropharyngeal cancer cell line named mEER was implanted in mice tongues and treated with or without antibiotics and/or anti-PD-1. Bacterial changes associated with tumor development in the tongue were analyzed and in addition, quantification of the different immune cell types between the different groups of mice was done by flow cytometry.

RESULTS: The oral cavity of animals with tongue tumors had a higher abundance of *Staphylococcus* compared to the oral cavity of healthy mice. In contrast, healthy mice had a higher abundance of *Pseudomonas* and *Cloacibacterium*. Interestingly, we found that the antibiotic treatment decreased dendritic cell infiltration, and CD4+ T cell activation in lymph nodes as well as decreased CD8+ T cell infiltration in the tumors. Antibiotics did not affect immune cell infiltration in anti-PD-1 treated mice.

CONCLUSION: Tumor development affects the microbial composition in the oral cavity. Antibiotics affect immune cell infiltration into the tumor towards an environment associated with immunosuppression. Future analyses will allow us to explore whether anti-PD-1 immunotherapy modulates the immunological effects of antibiotics in HPV+ oropharyngeal cancer.

Funding: NIGMS-RISE R25 GM061838 and Alliance.

IRB/IACUC approval number: A630222.



LEVELS OF VITAMIN D IN CHRONIC SPINAL CORD INJURY VETERANS RESIDING IN PUERTO RICO

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PURPOSE: Spinal Cord Injury (SCI) patients present several factors which contribute to increase osteoporosis risk, such as immobilization with impaired bone turnover, and limited sun exposure. Low levels of vitamin-D are associated with an increased risk for osteoporosis. This study is designed to determine the prevalence of inadequate or severely deficient levels of vitamin-D in Veterans residing in Puerto Rico with chronic Spinal Cord Injury. It aims to determine if there is evidence of a relationship between patient demographics, past fracture history, sunlight exposure and Vitamin-D levels in this population.

METHODS: Cross sectional study performed on Veterans with Spinal Cord Injury who live in Puerto Rico, with inclusion criteria of ages 21 to 89 years old. Questionnaire given to collect demographic data, medical history, previous bone fractures, level of Spinal Cord Injury, present medications, and sun exposure. Laboratory samples obtained included 25-OH-Vitamin-D, serum calcium, intact PTH, phosphate, albumin, creatinine, alkaline phosphate, Magnesium, TSH and vitamin B-12 levels.

RESULTS: Fifty-two adults participated in the study (65% paraplegic and 35% tetraplegic). Patients with tetraplegia obtained approximately an average of 36.0 ng/dL of Vitamin-D in blood, while patients with paraplegia had an average of 34.0 ng/dL of 25-OH-Vitamin-D.

CONCLUSION: Preliminary values demonstrate borderline low levels in both tetraplegic and paraplegic. Even though Puerto Rico is in the tropics, deficiency of vitamin-D is still present in Spinal Cord Injury population. This study will expand knowledge on the risk of osteoporosis and necessary corrective interventions to monitor vitamin-D levels appropriately.

Funding: Non-funding.

IRB/ IACUC approval number: 00813.



ASSOCIATION OF GUT MICROBIOME WITH DIABETES MELLITUS AND COGNITIVE IMPAIRMENT IN PUERTO RICO: A PRELIMINARY REPORT

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PURPOSE: Alzheimer's disease (AD) is the most common cause of dementia. In Puerto Rico, AD is the fourth leading cause of death. Diabetes Mellitus is nowadays considered a risk factor for AD. Evidence suggests that the gut microbiome plays a role in the pathophysiology of AD through neuroinflammation and amyloid deposition leading to cognitive impairment. Main objective: study the fecal microbiome composition and diversity of Puerto Ricans with AD compared to cognitive-intact controls.

METHODS: Fifty-three participants, 28-AD, 25-controls, were evaluated clinically and cognitively (MoCA/CDR). Stool collected for genomic DNA extractions and microbiome characterization. NextGen Illumina MiSeq was used to sequence 16S rRNA genes (V4 region) and analyzed with standard pipelines.

RESULTS: No statistically significant differences in bacterial diversity and richness between AD vs. controls. We found slight differences in composition, including an abundance of Euryarchaeota in AD, while controls had higher levels of Bacteroidetes. Compared to cognitively intact, a decrease in gut microbiome diversity was seen among participants with cognitive decline ($p=0.02$). Roseburia seems to decrease with cognitive impairment severity. Diabetics have significantly reduced Anaerostipes and Ruminococcus. AD participants with/without Diabetes have predominance of Euryarchaeota. Controls with Diabetes have more Proteobacteria and Bacteroidetes compared to cognitively impaired.

CONCLUSION: Both Diabetes and neurocognitive decline appear to reduce butyrate-producing bacteria, which may be related to a decrease in the homeostasis of the gut-brain axis and lead to microbiome dysbiosis in the setting of disease. A better understanding of the gut microbiota will be an invaluable approach for development of modulation-based therapeutic interventions.

Funding: This research was supported by the NIH National Institute of General Medical Sciences under grant numbers 1U54GM133807 and P20GM103475. IRB approval number: 2290033626.



ASSOCIATION OF GUT MICROBIOME WITH COGNITIVE IMPAIRMENT IN PUERTO RICANS

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PURPOSE: Alzheimer's disease (AD) is the most common type of dementia, a debilitating disorder that could result in complete loss of mental functions and death. In Puerto Rico, AD is the fourth leading cause of death, while in the United States is the sixth. Evidence suggests that the gut microbiota plays a role in the pathophysiology of AD through neuroinflammation and amyloid deposition at brain. Our objective: to study the fecal microbiota composition and diversity of Puerto Ricans with AD compared to cognitive-intact controls and associate the microbiota with cognitive impairment.

METHODS: We recruited 53 participants, 28 with AD and 25 controls, who underwent clinical and cognitive assessments (MoCA/CDR). Genomic DNA extractions performed on collected fecal samples. NextGen Illumina MiSeq was used to sequence 16S rRNA genes (V4 region) and analyzed with standard pipelines for microbiome species.

RESULTS: Preliminary analyses showed no statistically significant differences between AD and controls in bacterial diversity and richness. However, AD participants showed an abundance of Euryarchaeota, while controls had higher levels of Bacteroidetes. We found significant differences in alpha diversity with cognitive decline and a reduction of Roseburia -a known butyrate producer with protective and anti-inflammatory properties- in participants with severe cognitive impairment.

CONCLUSION: First study in Puerto Rico comparing a neuro-degenerative disease common in the aging population with the gut microbiota. The study of the Gut-Brain-Axis may open the possibility for preventive microbiota-based therapies and strategies for a healthy microbiome resulting in better outcomes for our patients with and without AD.

Funding: This research was supported by the Puerto Rico IDeA Network of Biomedical Research Excellence, an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant no. P20GM103475 and 1U54GM133807.

IRB approval number: 2290033626.



TEST OF A CONVERSATIONAL ARTIFICIAL INTELLIGENCE MODEL ON CLINICAL RESEARCH COMPLIANCE, TRAINING, AND ETHICS

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PURPOSE: ChatGPT (OpenAI) is a conversational artificial intelligence (AI) model in a dialogue format that answers initial and follow-up questions. The purpose of this project is to test ChatGPT in its delivery of decision-making advice on clinical research compliance, training, and ethics. The significance of this project is to explore real-time access to reliable advice on clinical research topics to safeguard participant's welfare and integrity of the data.

METHODS: During ChatGPT research preview, the author asked ChatGPT 7 initial questions on the following topics: missed study visits, assessment of clinical significance for out-of-range laboratory values, source data correction, training requirements, minor assent to participation, competing clinical trials, and stipend determination. Eight to twelve days later, the author asked follow-up questions to 3 of them. The answers to the questions were evaluated by the author using a rubric. The content is attributed to the author and is AI-generated in a way no user could reasonably miss or misunderstand.

RESULTS: The answers to the questions are complete, reasonable, identify fundamental elements to be considered, and aligned with practice standards. Interestingly, ChatGPT acknowledges it does not have the authority to make clinical decisions. Also, ChatGPT label certain topics as "ethical dilemmas" or "complex issues", while provides guidance on how to approach them, including "consultation with a clinical ethics committee" and consideration of "certain circumstances".

CONCLUSION: This innovative use of a conversational AI model in a dialogue format shows promising delivery of decision-making advice on clinical research compliance, training, and ethics.



EXPOSURE TO LIFE THREAT AMONG WOMEN: THE EFFECTS OF COVID-19 AND HURRICANE MARÍA ON POSTTRAUMATIC STRESS DISORDER SYMPTOMS

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PURPOSE: Experiencing life threat has increased due to unprecedented disasters in Puerto Rico, such as Hurricane María and COVID-19 pandemic. Life threat encompasses actual or threatened harm to the survival of the individual. Although COVID-19 is not considered a criterion A cause for posttraumatic stress disorder (PTSD), this double-hit has placed perinatal women vulnerable to developing symptoms. The double-hit consequences on maternal PTSD symptoms are unknown. This study aimed to determine changes in maternal PTSD symptoms as a result of María and perceived COVID-19 threat.

METHODS: We recruited 55 mothers who were pregnant during Maria. In 2019, we interviewed mothers to understand prenatal threat exposure due to Maria using the Exposure to Disaster Scale (EDS). In 2021-2023, we followed up mothers to report perceived COVID-19 threat with an adapted EDS. Exposures were dichotomous variables. At both times, we administered the PTSD Checklist for DSM-5. We used generalized estimating equations to determine the effect of Maria's and COVID-19 threat on maternal PTSD symptoms.

RESULTS: After adjusting for maternal mental health history, the overall effect of COVID-19 threat was significant, $W(1)=13.394$, $p<.001$. Compared to mothers with COVID-19 threat, non-exposed mothers had fewer PTSD symptoms ($B = -1.259$, $p = .005$). Maria threat interacted with COVID-19 threat, $W(3)=20.338$, $p<.001$. Specifically, compared to mothers with only Maria threat, mothers with both threats reported more PTSD symptoms ($B = .423$, $p = .048$).

CONCLUSION: Findings indicate that mothers with both threat to life reported more PTSD symptoms. Mothers who reported Maria's and non-COVID-19 threat had fewer PTSD symptoms.

Funding: NIH R25MD007607, NIH R21MD013652, NIH U54GM133807.

IRB Approval Number: #A3910519 HELIOS IRB.



ANXIETY AND DEPRESSION SYMPTOMS IN A SAMPLE OF HISPANIC PATIENTS WITH POLYCYSTIC OVARY SYNDROME

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PURPOSE: Polycystic Ovary Syndrome (PCOS) is an endocrinopathy affecting females within their reproductive years. Due to endocrine dysregulation and ensuing changes in physical appearance, patients may present with psychiatric comorbidities. The purpose of this study is to evaluate general health and symptoms of depression and anxiety in a sample of Hispanic patients with PCOS.

METHODS: Cross-sectional study of 63 female patients with PCOS. PCOS was defined using the Rotterdam criteria. In addition to medical, laboratory and imaging studies to confirm PCOS, patients completed a series of questionnaires to assess anxiety and depression symptoms (PHQ-9). PHQ-9 survey answers were evaluated and categorized by severity of symptoms. A symptom profile for each patient group was generated.

RESULTS: Depression severity among our sample were: none to minimal (25%); mild (40%); moderate (25%); moderately severe (8%) and severe (2%). The most frequent symptoms were fatigue (87%), sleep disturbances (75%) and appetite changes (67%). Symptoms such as persistent sadness (59%), and feelings of guilt/worthlessness (43%) were also frequent and were found irrespective of depression severity score. Suicidality or suicidal ideation was also found irrespective of severity score. Almost 20% of patients with PCOS self-reported a very difficult QoL.

CONCLUSION: A high prevalence of depression was found in our study. Worrisome symptoms (persistent sadness, feelings of worthlessness and suicidal ideation) were common and present among all severity scores. These findings emphasize the importance to assess for subtle psychological symptoms, and to implement strategies for better evaluation and improvement in QoL of our PCOS patients.

Funding: Supported in part by Hispanic Center of Excellence - University of Puerto Rico School of Medicine- U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce Grant Number: D34HP24463 and by The Hispanic Alliance for Clinical and Translational Research (Alliance) which is supported by the National Institute of General Medical Sciences (NIGMS) National Institutes of Health under the Award Number U54GM133807. IRB approval number: B0790117.



TOLAC AND VBAC SUCCESS IN WOMEN ADMITTED TO A LABOR ROOM AT A COMMUNITY HOSPITAL IN SAN JUAN PUERTO RICO

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PURPOSE: Over the years, the number of patients requesting a planned trial of labor after cesarean section (TOLAC) has risen as a consequence of both patient and provider education, respect for autonomy, as well as other clinical considerations. The outcomes of TOLAC can range from a successful vaginal birth after cesarean section (VBAC) to an unanticipated intrapartum cesarean section. In the United States, VBAC rate rose from 69.8% to 74.7% between 2010 and 2020. We aim to compare the actual VBAC rate among women admitted to a community hospital in San Juan, Puerto Rico, from 2010 through 2019.

METHODS: After IRB approval, a retrospective review was performed on patient charts identified by the corresponding CPT code for VBAC during admission to labor and delivery rooms. Frequency and percentage analysis was done using descriptive statistics.

RESULTS: A total of 918 medical records from patients who requested TOLAC were evaluated. From the 14 patients who attempted TOLAC in 2010, 11 (78%) had a successful VBAC, yielding a VBAC rate of 4.2%. While 76 (60%) out of the 127 individuals who attempted a TOLAC in 2019 succeeded, resulting in a VBAC rate of 24.4% for that year.

CONCLUSION: From 2010 to 2019, VBAC rate increased from 4.2% to 24%, respectively. VBAC rates differ between institutions and may be influenced by parameters like BMI, age, and prior obstetric history in addition to antepartum, intrapartum, among other factors. In-depth investigation is required to pinpoint potential causes of the rising VBAC rate.

IRB approval number: 00002788.



DYSMENORRHEA IN ADOLESCENTS 13 TO 18 YEARS OF AGE: PREVALENCE AND IMPACT ON SCHOOL PERFORMANCE

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PURPOSE: Dysmenorrhea is the leading gynecological complaint among adolescents. Reported prevalence has ranged from 15.8% to 89.5%, with higher rates reported in the Hispanic population. This debilitating condition has a significant impact on health-related quality of life, academic performance, and healthcare utilization. It is essential for primary healthcare providers to acquire knowledge and data in order to diagnose and adequately manage these patients. We aim to collect information regarding the prevalence of dysmenorrhea among Hispanic females, its characteristics, associated symptoms, and its effect on school performance.

METHODS: Following IRB approval, females between the ages 13 and 18 years-old were given a validated 20-item questionnaire. A descriptive data analysis was performed using Stata v.16, Fisher's Exact test and chi-squared tests. Statistical significance was defined as a p value ≤ 0.05 .

RESULTS: A total of 212 participants completed the questionnaire. We identified a 98% prevalence of dysmenorrhea in our population. The most reported associated symptoms were lower abdominal pain (76%), headaches (65%), and anorexia (43%). A decline in concentration was reported by 85% of the participants in terms of academic achievement. School attendance was not affected.

CONCLUSION: Dysmenorrhea prevalence is high among Hispanic adolescents in Puerto Rico; lower abdominal pain, headaches and anorexia are the most typical clinical manifestations reported. Even though participants claimed to have trouble focusing and it negatively affected their school performance, dysmenorrhea did not impact their ability to attend class.

IRB approval number: 00002788.



HORMONAL VS NON-HORMONAL THERAPY PREFERENCE IN POSTMENOPAUSAL WOMEN WHO ATTEND A COMMUNITY HOSPITAL

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PURPOSE: Vaginal and vasomotor symptoms are the most often reported complaints among postmenopausal women in the US. Several hormonal and non-hormonal approaches are used to treat symptoms. Observational research suggests that race and ethnicity are essential factors to consider when evaluating vasomotor symptoms. Our aim is to identify the most prevalent symptom reported by Hispanic women in Puerto Rico (PR) and the main treatment option preferred for symptom control.

METHODS: After IRB approval, Women between the ages of 52 and 59 were recruited. A validated self-administered survey was filled out by participants. To analyze the data, descriptive statistics were performed.

RESULTS: The survey was completed by 84 participants. Hot flashes (67%), night sweats (64%), and sleep issues (63%), which are postmenopausal symptoms, were the most frequently reported by Hispanic women living in Puerto Rico. Among the treatment options, non hormonal were favored over hormonal treatments by our population. The most preferred approach of symptomatic relief was exercise (38%) followed by melatonin or other teas (21%) and ibuprofen (22%) for musculoskeletal pain. Regardless of symptomatology, 27% reported not utilizing any type of treatment. Only 2% and 11% of participants, respectively, used hormonal cream or pills.

CONCLUSION: Hot flashes were our population's most prevalent presenting symptom. Exercise was the preferred non-hormonal treatment option for symptomatology control among Hispanic postmenopausal women residing in PR. Household income and patient education may have an influence on these findings. A larger scale investigation should be conducted considering the small sample size.

IRB approval number: 00002788.



GANODERMA SPP. EXTRACTS FROM PUERTO RICO SHOW SELECTIVE ANTI- TRIPLE-NEGATIVE BREAST CANCER POTENTIAL

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PURPOSE: Triple-negative breast cancer (TNBC) accounts for about 10-15% of all breast cancers diagnosed in people of color (e.g. Hispanics or African Americans). TNBC is characterized by the lack of hormone (ER & PR) and the epidermal growth factor receptor 2 (HER2), and there is an unmet clinical need for therapeutic approaches. The basidiomycete *Ganoderma*, has been used for medicinal purposes; including neotropical ones that are being deeply studied in TNBC models. The objective of this study is to identify the effects of neotropical native *Ganoderma* species found in Puerto Rico and test their efficacy in breast cancer cells. Native fractions extracted from *Ganoderma multiplicatum* (GMu; F1, F2, F3, F4, F6, F7) were tested against TNBC (SUM149) and non-cancerous mammary epithelial (MCF10A) cell lines.

METHODS: Cell viability assays were performed using increasing concentrations of different fractions ranging from 0 to 75 μM for 72h. After treatment, cell viability was determined by fluorescence detection (GloMax, Promega).

RESULTS: Results indicate that SUM149 cancer cells have a significantly reduced viability in fractions F1-F4, F6, and F7. A greater significant inhibitory concentration was detected for F7 (IC₅₀ = 3.9 μM), F1 (IC₅₀ = 8.4 μM), and F2 (IC₅₀ = 11.3 μM). MCF10A non-cancerous cells results show only detectable inhibitory indexes for F1, F6 and F7 at IC₅₀ of 497.9 μM , 15.41 μM and 1,116 μM , respectively.

CONCLUSIONS: We conclude that fractions F1, F2 and F7 can be evaluated in more depth as fractions that might contain selective anti-TNBC bioactive compounds with great therapeutic potential.

Funding: NIH/NIGMS #R16GM145488; USDA/NIFA/SBIR; Puerto Rico Science, Technology & Research Trust.



DRUG INTERACTIONS, METABOLIC ACTIVITY AND GENE EXPRESSION OF THE IRON CHELATOR DEFERASIROX WITH CHEMOTHERAPY

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PURPOSE: In cancer, iron metabolism is commonly altered because of an increased dependence for cell growth and energy production. Unfortunately, despite improvements in cancer outcomes, many of these tumors develop resistance against principal chemotherapies (e.g., cisplatin (CisPt) and doxorubicin (Doxo)). Deferasirox (Def), an FDA-approved iron chelation therapy, is a drug under study for cancer therapy.

METHOD: Herein, we studied Def in combination with CisPt and Doxo on lung carcinoma A549 cells. Viability assay results showed that Def has synergistic effects in combination with CisPt and additive effect in combination with Doxo after 24 h of incubation using SynergyFinder.

RESULTS: The results from qPCR gene expression studies showed that Def alone and in combination induced a significant downregulation of EGFR, MMP2, CHD4 genes related to resistance and metastatic process. In addition, Def alone induced the overexpression of NDRG1 gene confirming the chelation of iron and disruption of iron homeostasis. In contrast, Def in combination with CisPt or Doxo decreases the expression of the NDRG1 suggesting that the main effect of Def with these chemotherapies is not on iron metabolism. Furthermore, for the cell cycle assay, Def induces arrest at the G₀/G₁, while CisPt at the S and Doxo at the S and G₂/M phases. Furthermore, we determined that the mitochondrion is the main organelle affected by Def diminishing the membrane potential.

CONCLUSION: Overall, this work will set the basis for adjuvant therapies against chemoresistance and metastasis processes using an iron chelator.

Funding: This project was made possible by the sponsor of the Sloan Scholar Mentoring Network Career Development Grant.



EFFECTS OF STRESS PRIOR TO COCAINE SELF-ADMINISTRATION ON SEEKING BEHAVIOR

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PURPOSE: Co-morbidity between cocaine addiction use disorder (CUD) and trauma/stressor-related conditions has been documented repeatedly, indicating a strong link between stress and cocaine use. In addition, some mental illnesses, such as anxiety, depression, trauma, and stressor-related disorders, are identified as risk factors for developing a drug addiction. Therefore, this research aims to provide insight into how stress influences cocaine acquisition and seeking behavior in male and female rats. We hypothesize that male and female rats exposed to stress prior to cocaine acquisition will show an increase cocaine-seeking behavior and drug consumption compared to non-stressed rats.

METHODS: Male and Female Sprague Dawley rats were subjected to acute stress in a single session of fear conditioning, in which a total of 3 habituation tones and 7-foot shocks paired with tones will be presented. Following stress exposure, rats were subjected to 12 short-access cocaine self-administration (2-h/day), followed by 15 days of extinction training (2-h/day) and cue-induced reinstatement.

RESULTS: Preliminary results show that the stressed male group has no difference in cocaine consumption during cocaine acquisition and extinction compared to the non-stressed male group. Interestingly, the stressed male group had higher active lever presses in cue-induced reinstatement than non-stressed male rats.

CONCLUSION: These results suggest that stress is an influential factor contributing to enhancing the reinforcing effects of cocaine and leading to increased cocaine-seeking behavior. Currently, we are performing experiments to investigate if stress prior to cocaine self-administration affects drug-seeking behavior in female rats as observed in male rats.

Funding: MTSO- INBRE-P20GM103475-19, NIGMS-U54GM133807, and RCMI- 3U54MD007579-37S1, YPP- NIH-NIGMS T32GM144896/NIH-NIGMS R25GM082406

IACUC approval number: 2202000755.



INCREASE IN THE SUSCEPTIBILITY TO COVID-19 DURING THE FUNGAL SPORE SEASON AMONG RESIDENTS OF SAN JUAN AND CAGUAS, PUERTO RICO

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PURPOSE: Coronavirus disease 19 (COVID-19) is an emergent respiratory health condition caused by the SARS-CoV-2 virus. Studies have identified outdoor particulates as a risk factor for increased COVID-19 prevalence. The impact that outdoor fungal spores, a predominant biological particulate, have on COVID-19 remain unknown. This study evaluated correlations between levels of fungal spores and COVID-19 cases in San Juan and Caguas. In addition, we compared the serum levels of angiotensin-converting enzyme 2 (ACE-2), transmembrane serine protease 2 (TMPRSS2), receptors for SARS-CoV2, and inflammatory cytokines of residents of both municipalities (Caguas = 28; San Juan = 30) during the Season of Fungal Spores (September, October, and November).

METHODS: We performed a Spearman Correlation Test to evaluate the correlation between COVID-19 cases and levels of fungal spores in 2020. To assess the susceptibility to COVID-19, we measured with ELISA and a multiplex bead-based immunoassay, the levels of peripheral blood ACE-2, TMPRSS-2, and cytokines (IFN-gamma, TNF-alpha, IL-1 beta, IL-1 alpha, IL-5, IL-6, IL-8, IL-10, IL-17, and IL-12 p70).

RESULTS: COVID-19 cases were positively correlated with Fungal Spores in Caguas (Rho = 0.4620, $p < 0.001$) and San Juan (Rho= 0.3440, $p < 0.001$). We found that levels of ACE-2 were downregulated during the Season of Fungal Spores ($p < 0.001$), and TMPRSS2 was downregulated among Caguas residents ($p < 0.0001$). Also, levels of IL-17 were more elevated among Caguas residents ($p = 0.020$), and IFN-gamma were elevated in San Juan ($p = 0.069$).

CONCLUSION: These results suggest that fungal spores may increase susceptibility and morbidity to COVID-19.

Funding: This study was partially sponsored by the Abarca Better Health Community Program, Puerto Rico Public Health Trust, and The Center for Collaborative Research in Health Disparities (RCMI).

IRB approval number: A9830220.



EVALUATION OF THE ERGOSTEROL PEROXIDE AND PACLITAXEL DRUG COMBINATION ON TRIPLE-NEGATIVE BREAST CANCER MODELS

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PURPOSE: The Triple-Negative Breast Cancer (TNBC) subtype mostly affects African-American, Hispanic and younger women and treatment is particularly complicated. Paclitaxel (PTX), an anti-mitotic agent that has been widely used in TNBC treatment, causes many sides effects. However, the natural product Ergosterol Peroxide (EP), is non-toxic to healthy tissue and displays anti-cancer effects on TNBC models. The objective of this study was to assess the combinatorial effects of EP and PTX on TNBC.

METHODS: This study tested drug combinations using both *in vitro* and *in vivo* assays. *In vitro*: SUM-149 TNBC cells were treated with EP (0-100 μ M), PTX (0-0.5 μ M), or their combination EP+PTX, and viability was measured. *In vivo*: female mice (n=18/group) were injected with SUM-149 cells. Mice were gavaged daily with vehicle or EP (100mg/kg_BW) and weekly injected with vehicle or PTX (5mg/kg_BW) for a period of 10-weeks while monitoring tumor growth and body weight weekly. Statistical analysis performed was Two-way ANOVA with Tukey's and Bonferroni Multiple Comparison.

RESULTS: *In vitro* assay shows significant differences when comparing effects on cell viability of EP versus EP+PTX at EP concentrations of 1.56 μ M (P<0.0001), 3.13 μ M (P<0.0001), 6.25 μ M (P<0.0001), and 12.5 μ M (P<0.02). *In vivo* assay shows that in weeks 2, 3, and 7, the EP+PTX-tumors were significantly smaller in size than the PTX-tumors (P<0.02 to P<0.05). There were no changes in animal weight, suggesting that the compounds were not toxic.

CONCLUSION: These preliminary findings highlight the potential benefits of using the EP+PTX combination for TNBC treatment, particularly in reducing tumor growth; warrant further investigation.

Funding: This study was sponsored by NIH/NIGMS #R16GM145488 to MMM, and the Therapeutic Accelerator Program (TAP) from the Puerto Rico Science, Technology and Research Trust. We would also like to acknowledge Mercedes Lacourt for her support in the project.

IACUC approval number: 037-2021-16-01-PHA-IBC.



BIOLOGICAL SEX DIFFERENCES AND DYSREGULATED INTERFERON TYPE 1 RESPONSES IN HIV-1 NEUROPATHOGENESIS

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PURPOSE: People living with HIV (PWH) develop neurocognitive disorders associated with the infection, driven by infiltrated monocytes, neuroinflammation, and neuronal dysfunction. Type 1 interferon (IFN-1) signaling is a potent immune antiviral response, with known functions in essential processes such as microglia activation, synaptic plasticity, and cognitive function. We hypothesize that disrupted IFN-1 signaling triggers monocyte infiltration, neuronal dysfunction, and cognitive decline in PWH.

METHODS: We measured Interferon alpha (IFN-a) and beta (IFN-b) in the plasma of HIV-negative controls, HIV-positive stratified by cognition, and Alzheimer's disease (AD) patients, by ELISA and cytokine array. Then, we measured interferon alpha receptor 1 (IFNAR1) in CD14+ monocytes, in peripheral blood mononuclear cells, by flow cytometry. Finally, we co-cultured patient monocytes with human cortical brain organoids to uncover mechanisms driving neuronal dysfunction *in vitro*.

RESULTS: IFN-a1 levels were slightly higher in the plasma of cognitive impaired PWH and significantly higher AD patients ($p=0.03$), compared to HIV-negative. Higher levels of IFN-a2 were detected in plasma of cognitive impaired patients, compared to cognitively normal PWH ($p=0.02$). Flow cytometry revealed a lower percentage of IFNAR1+ monocytes from PWH ($p=0.02$) and AD patients ($p=0.01$) compared to HIV-negative. IFNAR1 levels significantly decreased in monocytes from males ($p=0.03$), but not from females. Brain organoids co-cultured with monocytes also showed decreased IFNAR1 levels and differentially secreted IFN-a and IFN-b.

CONCLUSION: Results suggest that IFN-a and IFN-b respond differently during HIV infection and disrupted IFN-1 signaling in monocytes may contribute to HIV neuropathogenesis. Biological sex differences observed in IFN-1 responses warrant further characterization.

Funding: NINDS 1K22NS118975, NIMH 5R21MH095524, NINDS R01NS099036, NYU-COMRADE 5R25NS094093, UPR-MSRCMI TPC U54MD007600, NIGMS PR-INBRE 5P20GM103475, The Alliance U54GM133807. IRB approval number: B3410121.



LEUKEMIA INHIBITOR FACTOR SIGNALING MECHANISM FOR NEUROGENESIS IN ASTROCYTIC CELLS EXPOSED TO HIV-GP120 PROTEIN

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PURPOSE: Involved with the central nervous system, Leukemia inhibitory factor (LIF) is a cytokine associated in the development, survival, and protection of hippocampal cells such as astrocytes. It is known that HIV-gp120 protein is associated to provoke several neurocognitive disorders (HAND) including loss of concentration, slowed movement and in severe cases, dementia. In vitro studies utilizing rats' astrocytic cells treated with LIF, demonstrated the promotion of cell survival. However, the mechanisms by which the signaling of neurogenesis, astrocyte proliferation, apoptosis, and necrosis are still unknown. Our goal is to demonstrate the mechanisms by which LIF prompts neurogenesis and proliferation.

METHODS: Sprague Dawley rat in her 18th gestation day underwent surgery for extraction of the fetuses. From this fetus the hippocampus was dissected in order to extract astrocytic cells. Primary cell cultures were performed to isolate astrocytes. These cells were then introduced to LIF, LIF + HIV-gp120 protein, a naïve negative control and lipopolysaccharide (LPS) positive control for cell death, all for a period of 1-hour and 24-hours. Astrocytes proliferation, viability, apoptosis, and necrosis was then assessed.

RESULTS: Our preliminary result show that LIF is promoting neuronal development after treatment with HIV-gp120 protein. An increase in microtubule-associated protein 2 (MAP2), in addition, an expression of neurites (NeuN) was observed in the presence of LIF after treatment with HIV-gp120.

CONCLUSION: Based on previous findings, LIF promotes astrocyte proliferation and viability. Also, by LIF providing neuroprotective functions, in vitro, it has the potential to help fight against neurodegenerative disorders prompt by HIV.

FUNDING: Supported by Universidad Central Del Caribe (UCC) and the office of the Associate Dean for Research and Graduate Studies, The Alliance-NIMHD-NIH, Expanding Undergraduate Students Education, Opportunities and Options in Clinical and Translational Research Supported by the US Department of Education: Title V Grant Award #P031S160068 and MAC-FRED Program 2018. The research reported was supported by the National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health under award number U54GM133807. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

IACUC approval number: #041-2017-3301PHA.



THE CELL-SIGNALING OF LEUKEMIA INHIBITORY FACTOR IN HIPPOCAMPAL NEURON REGENERATION

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PURPOSE: Leukemia inhibitory factor (LIF-1) is a multifunctional cytokine protein with a variety of roles, including neural development. Previous literature has found that LIF is involved in cerebral development in rats. More specifically, it was found that after injecting LIF into the rodent's cerebrum increased the number of neurons. This could imply that LIF-1 may have some kind of neuro-regeneration role, however said mechanism has not yet elucidated. Our goal is to deduce the role of LIF-1 in neuro-regeneration and derive the mechanism of action of LIF-1 in neuro-regeneration. With the end to possibly utilized LIF-1 as a possible therapeutic agent to treat patients suffering from HIV-associated neurocognitive disorders (HAND).

METHODS: To study the effects of LIF-1 on HIV cytotoxic neurons in an in vitro rat model, we utilized 18-day Sprague Dawley (SD) fetus hippocampal neuron cells. SD neuron cells were treated with LIF-1, gp120, or LIF-1 + gp120 for 1hr or 24 hrs and left to incubate. The controls used were naïve and LPS. Cell viability and cell proliferation were measured to determine the effect of LIF-1 on neurons. Apoptosis and necrosis assays were performed to determine cell death pathway.

RESULTS: Suggesting that LIF promotes neurogenesis after exposure to HIV-gp120 protein. An increased expression of microtubule-associated proteins (MAPs), a marker of mature neurons was found. The presence of neurites (NeuN) increased when treated with LIF-1.

CONCLUSIONS: These results demonstrate that LIF-1 has neural regeneration potential. Suggesting the used of LIF-1 as a potential drug for future HIV treatments.

Funding: Supported by Universidad Central Del Caribe (UCC) and the office of the Associate Dean for Research and Graduate Studies, The Alliance-NIMHD-NIH, Expanding Undergraduate Students Education, Opportunities and Options in Clinical and Translational Research Supported by the US Department of Education: Title V Grant Award #P031S160068 and MAC-FRED Program 2018. The research reported was supported by the National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health under award number U54GM133807. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

IACUC approval number: #041-2007-3301PHA.



THE UNDERLYING MECHANISM OF PKR AND UPR BLOCKS HIV-1 ENTRY IN MONOCYTIC CELLS THROUGH PSP.

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PURPOSE: There is an urgent need to characterize treatment options to restrict HIV entry. Actin's cytoskeleton represents a physical barrier during HIV entry by depolymerization of actin's filaments. The Unfolded Protein Response (UPR), a cytoprotective mechanism against endoplasmic reticulum stress, has been linked to interferon-induced proteins Protein Kinase-R (PKR), an immune and cytoskeletal regulator. This study sought to determine the anti-restrictive roles of PolySaccharide Peptide (PSP) extracted from the mushroom *Coriolus versicolor*, through overlapping signaling of PKR and UPR.

METHODS: The anti-HIV entry role of PSP was evaluated using THP-1 monocytic cell treated with 200µg/ml for a 6-days period, prior/after infection. Quantitative proteomics was performed to evaluate the mechanistic regulation in cytoskeleton and UPR. Viral load was performed to assess total viral particles present after treatment with/without PSP using UPR/PKR inhibitors. The UPR components and cytoskeletal markers were measured by means of immunoblotting and quantitative Reverse Transcription PCR (qRT-PCR).

RESULTS: Quantitative proteomic data, revealed a total of 110 cytoskeletal and 28 UPR proteins differently regulated upon PSP treatment, including SSH-phosphatase and tropomodulin which negatively impacts HIV-entry. Similar expression patterns between qRT-PCR and proteomics were obtained for cytoskeletal markers Cofilin-1/Gelsolin. Viral load resulted in an average of 73% viral restriction (PSP), 11% (PKR blocker) and 30% (UPR blocker). Taken together, these findings suggests that PSP upregulates UPR and key cytoskeleton markers in the reverse order of HIV-induced mechanism.

CONCLUSION: Our results demonstrate for the first time, a PSP-induced role towards interferons and cytoskeleton re-arrangement providing a unique model for anti-HIV therapeutics.

Funding: This research was funded by The Puerto Rico Science, Technology and Research Trust (PRSTRT), #2020-00158 (N.M.B.); NIH/INBRE pilot project, #P20GM103475 (N.M.B.).



ONCOGENIC EFFECTS OF HIV GP120, SURVIVAL UPR MECHANISM BEHIND.

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INTRODUCTION: Human immunodeficiency virus (HIV-1) infected patients are more prone to developing cancers, including glioblastomas (GBM). New treatment methods that take into consideration the functional role of HIV on tumor progression and chemotherapeutic resistance are needed. The goal of this study is to identify the biological mechanisms of HIV infection influenced on GBM progression and chemotherapy resistance. Previous data from our lab showed that exposure to HIV-1 exterior envelope glycoprotein (gp120) caused an increased proliferation and resistance to temozolomide in established (U87, A172) glioma cell lines and increase in the endoplasmic reticulum (ER) stress. Based on these findings, we hypothesize that gp120 activates an unfolded protein response (UPR) induced pathways that enhances glioma cell proliferation.

METHODS: Viability and flow cytometry analysis of cell cycle, western blot, qRT-PCR and quantitative proteomic approaches were used to verify if exposure to gp120 stimulates proliferation, survival and ER stress in glioma cells.

RESULTS: Our data indicates a gp120 induced migration, proliferative and protective responses granted by the expression of GRP78, master regulator of the UPR. Quantitative proteomics studies have identified the activation of the ER stress/ UPR pathways in HIV-gp120-exposed glioma cells. GRP78, ATF6, PERK and IRE1 α ER stress markers are currently being validated by western immunoblot and qRT-PCR.

CONCLUSION: In this study, we utilized glioma cells and cell biology approaches coupled with proteomics screening to dissect intracellular mechanisms associated with gp120-activated glioma growth. The investigated signaling mechanisms will provide a platform for developing therapeutic strategies for HIV positive glioma patients.

Funding: This research was funded by The Puerto Rico Science, Technology and Research Trust (PRSTRT), #2020-00158 (N.M.B.); NIH/INBRE pilot project, #P20GM103475 (N.M.B.).



DELIVERY OF EDELFOSSINE THROUGH THE BLOOD-BRAIN BARRIER USING A TRANSFERRIN-BASED SYSTEM

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PURPOSE: To test the efficacy of edelfosine (a PLC- β inhibitor) as a neuroprotective treatment against excitotoxicity *ex-vivo* and against seizure-like behaviors *in vivo*. Because edelfosine does not cross the blood-brain barrier, this drug was encapsulated in a targeted, smart, nano-sized drug delivery system designed to cross this barrier and decrease seizure-like behaviors in a mouse model of epilepsy. Finally, we aimed to elucidate edelfosine's mechanisms at a gene-expression level in brain cells.

METHODS: The effect of edelfosine in neuroprotection was measured using *ex vivo* electrophysiology recordings in rat hippocampal slices (population spikes). The muscarinic agonist pilocarpine was used to induce the excitotoxic insult in these *ex-vivo* experiments. We also tested the effects of edelfosine-loaded nanoparticles against seizure-like behaviors *in vivo*, using a mouse model of epilepsy and measuring seizure-like behavior with the Racine scale. Finally, we measured the effect of edelfosine in pro-inflammatory gene expression by performing RT PCR in brain microglial cells.

RESULTS: Our *ex-vivo* results show that edelfosine (1 and 10 μ M) can be neuroprotective against muscarinic hyperstimulation induced by pilocarpine in hippocampal slices by recovering ~40% more population spikes compared to control. Edelfosine can also significantly decrease seizure-like behaviors in a mouse model of epilepsy at days 1 and 3 after a pilocarpine insult. Finally, edelfosine significantly decreased the expression of pro-inflammatory genes: TNF α , IL6, and NFKB1 in microglial cells 24 hours after treatment.

CONCLUSION: Our results suggest that edelfosine, an FDA-approved drug for clinical testing, could be repurposed as treatment against seizures that could have neuroprotective and anti-inflammatory benefits.

Funding: The Alliance Pilot Project was awarded to YDR and YFA from U54GM133807.

IRB/ IACUC approval number: #048,051-2021-50-01-PHA-CSC.



THE CELL SIGNALING MECHANISM FOUND IN LEUKEMIA INHIBITORY FACTOR TREATMENT ON HIV-GP120 PROTEINS IN AN ANIMAL MODEL

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PURPOSE: Leukemia inhibitory factor (LIF) is a cytokine with neuroprotective properties found in mammals. It has been demonstrated to lower inflammation in neuronal tissues that contain GP120, a protein found in HIV. Mortality from HIV has declined with the use of combinations of antiretroviral therapies (cART). However, cART therapies do not protect against secondary characteristics of HIV such as HIV Associated Neurocognitive Disorders (HAND). The research's goal is to evaluate LIF, due to its neuroprotective properties, as a candidate for future treatments that benefit people that suffer from HANDs.

METHODS: The goal is to improve rats' neuronal health and memory capacity in vivo. Stereotaxic surgery was performed to inject LIF and GP120 into the rat hippocampus. Subsequently, the hippocampus is dissected and stored. Proliferation and cell signaling assays were performed on different hippocampus samples to observe the type of cell signaling generated. Neuroplasticity development factors, such as MAP2 and NeuN were also analyzed.

RESULTS: Preliminary data demonstrates the increase in Beta-Amyloid accumulations in samples that have been injected with GP120. Neuropathogenic proteins, such as HIV-gp120, increase the prevalence of HANDs. Rat models treated with HIV-gp120 proteins showed a neurocognitive decline, but those with HIV-gp120 + LIF demonstrated improvement in all tests. This indicates that LIF has neuroprotective properties capable of counteracting the neurotoxic effects of HIV-gp120.

CONCLUSION: This research provides information on future treatments of HIV-associated neurocognitive disorders. The aim is to provide a better quality of life for HIV positive patients, where cognitive and motor functions are not affected.

Funding (if applicable): Supported by Universidad Central Del Caribe (UCC) and the office of the Associate Dean for Research and Graduate Studies, The Alliance-NIMHD-NIH, Expanding Undergraduate Students Education, Opportunities and Options in Clinical and Translational Research Supported by the US Department of Education: Title V Grant Award #P031S160068 and MAC-FRED Program 2018. The research reported was supported by the National Institute of General Medical Sciences (NIGMS) of the National Institutes of Health under award number U54GM133807. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. IRB/ IACUC approval number: #041-2017-3301PHA.



A DOSE RESPONSE STUDY OF RAF/MEK INHIBITOR AVUTOMETINIB AND FAK/PYK2 INHIBITOR DEFACTINIB IN GLIOBLASTOMA

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PURPOSE: Raf/MEK signaling is involved in tumor cell proliferation regulation and represents a promising target for treatment of cancers. However, preclinical studies identified, that the use of Raf/MEK inhibitor Avutometinib results in compensatory up-regulation of focal adhesion kinase (FAK) signaling, mitigating the treatment effect on tumor growth. We hypothesize that combinatorial treatment with Avutometinib and FAK/Pyk2 inhibitor Defactinib represents more effective treatment approach, compared with Avutometinib monotherapy. The purpose of the study was to determine effective doses of Avutometinib and Defactinib on glioblastoma cell viability.

METHODS: Dose response was evaluated with use of the live/dead assay in combination with fluorescence imaging. Primary human glioblastoma cell lines were used. Cells were treated with Defactinib (5 μ M, 10 μ M and 13nM) or with Avutometinib (5 μ M, 1 μ M and 500nM) for 48 or 72 hours, stained with calcein (green fluorescence, for live cells) and propidium iodide (red fluorescence, for apoptotic cells) and analyzed with a fluorescent microscope.

RESULTS: In 72 hours of treatment with Defactinib (10 μ M) and Avutometinib (500nM) 40% and 30% reduction in cell viability was detected respectively, together with significant modifications in cell morphology.

CONCLUSION: The most effective concentrations, leading for reduction in glioblastoma cell viability, were determined as 10 μ M for Defactinib and 500nM for Avutometinib upon treatment for 72 hours. In 48 hours of treatment significant changes of cell morphology were seen. Immunofluorescence analysis of actin cytoskeleton structures and cell cycle analysis will be further used to determine effect of Avutometinib and Defactinib on glioblastoma cell motility and proliferation.

Funding: This research was funded by the National Institutes of Health, grant 1SC1GM122691.



DO THE DIFFERENTIALLY EXPRESSED GENES IN PANCREATIC CANCER BEFORE TREATMENT MATCH THOSE AFTER CAR T CELL TREATMENT

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PURPOSE: This project approaches the task of gene selection and structuring through mathematical optimization methods in microarray experiments involving CAR T-Cells. To achieve this, we utilized Apply Multiple Criteria Optimization (MCO) in gene selection to analyze microarray datasets and conducted the individual analysis of single datasets. This allowed us to identify genes with the largest expression changes and to determine a series of potential markers associated with CAR T-Cell treatment.

METHODS: Our methodology makes use of MCO. In this work microarray experiments involving CAR T-cells as treatment for cancer were analyzed using a methodology developed by our research group, the Applied Optimization group. Using our analysis, it is possible to find those genes that changed their expression the most, without the adjustment of any parameter.

RESULTS: The focus of this project was to detect genes with the largest relative expression changes through MCO. By performing this procedure, we proposed genes as potential biomarkers and characterized, and inferred, their biological significance in CAR T-cell treatment in Pancreatic cancer. We emphasize that the application of these methods has the possibility of analyzing multiple experiments simultaneously with deterministic repeatability and user-independent objectivity.

CONCLUSION: Through the application of individual analyses in MCO, it was possible to detect genes with the largest relative expression changes. This allows characterizing and inferring their biological significance in diseases such as cancer, and in this way, we can think of different alternatives for cell therapies that involve CAR T-cells for cancer treatment.

ACKNOWLEDGEMENTS: This project was supported by the Engineering Research Center for Cell Manufacturing Technologies (CMaT), Advisor: Mauricio Cabrera, PhD, Co-advisor: Clara Isaza, PhD, and UPRM.



EVALUATION OF MONOCYTE SUBPOPULATIONS IN BIPOLAR DISORDER AND ITS ASSOCIATION WITH NEUROCOGNITIVE DETERIORATION

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PURPOSE: Bipolar Disorder (BD) is characterized by changes in mood and deterioration in neurocognitive functioning. Our preliminary data found significant immune activation in these patients. Changes in monocytes and their subsets have been described in several diseases but studies are scarce in BD patients related to mood episodes and neurocognitive deterioration. We aimed to investigate the association between the percentage and activation stage of different monocyte populations and mood changes with cognitive deterioration.

METHODS: Thirty-seven participants (26 cases and 11 controls) were recruited as part of the inflammatory cytokines and neurocognitive functioning in bipolar disorder patients across mood episodes project. The percentage of monocyte subpopulations (CD14/CD16) and the activation stage by HLADR levels were evaluated using Flow Cytometry. Neuropsychological tests were used to measure different cognitive domains. All statistical analyses were performed with SPSS version 29 and Graph Pad Prism version 9.5.1 software for Mac. Statistical significance was considered at $p < 0.05$.

RESULTS: BD patients had an increased number of circulating peripheral blood monocytes compared to healthy controls. Serum biomarker concentration showed significant correlation between HLADR levels in CD14++CD16+ and cognitive deterioration in BD patients vs healthy controls ($r = 0.48$, $p = 0.005$). We also found a significant correlation between the percentage of activated CD14+CD16+ HLADR+ and neurocognitive deterioration in BD ($r = 0.46$, $p = 0.032$).

CONCLUSIONS: The findings evidence a significant immune activation in BD including a higher proportion of activated monocytes and inflammatory signals. Worse neurocognitive functioning was found in bipolar patients.

Funding: The research reported in this publication was supported by RCMI grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health. Support was received also from the PRCTRC (U54MD007587); and the Hispanic Alliance for Clinical and Translational Research (U54GM133807).

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

IRB approval number: #B1250118.



CHANGES IN CLINICAL PSYCHOLOGICAL SYMPTOMATOLOGY AMONG HISPANIC LGB INDIVIDUALS: PRE AND POST HURRICANE FIONA.

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PURPOSE: The purpose of this analyses was to explore is there were differences in clinical psychological symptomatology (e.g., depression, anxiety, stress) among Hispanic lesbian, gay, and bisexual (LGB) individuals between two independent groups before and after hurricane Fiona.

METHODS: These analyses are secondary data from a quantitative method, cross-sectional design, pilot study. A sample of 68 (21-40 years old) Hispanic LGB participants ($n = 36$ pre-hurricane; $n = 32$ post-hurricane) were considered for the analyses. To evaluate depression, anxiety, and stress symptoms participants completed the Participants Health Questionnaire-8, Generalized Anxiety Disorder-7, and Perceived Stress Scale.

RESULTS: There was homogeneity of variances, as assessed by the Levene's test for equality of variances, $p > .05$ [depression = .653; anxiety = .659; stress = .601]. However, due to the differences on the sample size, independent-samples Mann-Whitney U test was performed. Exploratory results suggest there was no statistically significant differences in clinical psychological symptomatology before¹ and after² hurricane Fiona, for depression [$mdn^1 = 8.00$, $mdn^2 = 10.0$; $U = 705.00$, $p = 0.112$], anxiety [$mdn^1 = 6.5$, $mdn^2 = 8.5$; $U = 699.00$, $p = 0.130$], and stress [$mdn^1 = 29.00$, $mdn^2 = 28.5$; $U = 591.00$, $p = 0.853$].

CONCLUSION: Although clinical psychological symptoms were different for the sample after Fiona, they were not statistically significant differences when compared with the sample before Fiona. Studies suggest Hispanics living in Puerto Rico (PR) have developed great resilience capacity especially for hurricanes disasters. In addition, studies in PR among sexual and gender minorities also report great resilience capacity in this population. We preliminary discuss that LGB individuals has been forced to developed resilience to manage minority related stressors and sociopolitical oppression, therefore, it could help them to better cope with other major stressors such as a natural disaster.

Funding: The Hispanic Alliance for Clinical and Translational Research under the Award Number U54GM133807 from the NIGMS.

IRB: PHSU (#2104061049)



DEVELOPMENT AND USER'S EXPERIENCE OF AN ASSISTIVE TECHNOLOGY WEB APP IN PROMOTING OLDER ADULTS' FUNCTIONAL HEALTH

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PURPOSE: Functional disabilities (FD's) in older people can be compensated for by using assistive technologies (AT) to increase their independence, safety, and quality of life. Lack of AT information is the main barrier to using AT among this population. We aimed to develop and assess older adults with FDs' experiences using a novel AT Guide WebApp.

METHODS: We used a co-design process guided by the Honeycomb model to develop the WebApp. In Phase I, we developed the WebApp's content based on the AT needs and functional limitations of older Puerto Ricans. In Phase II, we used evidence-based guidelines to design the WebApp. In Phase III, we evaluated 14 participants' experiences using the WebAPP through focus groups and individual interviews. We used a directed content analysis with member checks for the interpretation of the results.

RESULTS: Mi Guía de Asistencia Tecnológica (MGAT) was developed with 94 AT devices in eight areas of daily activities. It includes the description, cost, benefits, considerations, resources for acquiring AT, photos, and videos of older people using AT. The MGAT was found easy to navigate and use, accessible, credible, desirable, useful, and valuable for learning about AT which improves independence and function. Recommendations were provided for enhancing the MGAT.

CONCLUSIONS: The participants' experiences about how they felt, used, and thought about the MGAT were positive. These findings serve as a foundation for informing the development of efficient AT information strategies using such technology as a first step to enhancing AT adoption and use among older people.

Funding: This research was supported by HiREC-NIMHD S21MD001830 and CCRHD-RCMI Grant U54-007600

IRB approval number: A4120121.



CHANGES IN SLEEP PATTERNS DURING COVID-19 PANDEMIC AMONG BREAST CANCER SURVIVORS

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PURPOSE: Hispanic women are more likely to experience insomnia, putting Hispanic breast cancer survivors at a significant disparity in quality of life. The COVID-19 pandemic and lockdown have resulted in unprecedented and dramatic changes that may lead to behavioral or psychological symptoms (e.g., sleep disturbance), particularly in breast cancer survivors may be at higher risk of infection or illness. The purpose of this study was to explore changes in sleep disturbance during the COVID-19 pandemic in Puerto Rican breast cancer survivors.

METHODS: We conducted a descriptive phenomenological study. Participants (N=27) were Spanish-speaking breast cancer survivors (age M=55.22, SD=11.33) living in Puerto Rico who had completed primary cancer treatment (e.g., surgery, chemotherapy, radiation), had access to the Internet and a digital device (e.g., smartphone), were capable of use videoconference software, and reported clinically significant sleep disturbance (i.e., ≥ 8 on the Insomnia Severity Index). Three focus groups were held online over videoconference and were recorded and transcribed verbatim. An inductive thematic analysis was conducted using Nvivo.

RESULTS: Our findings showed the following themes: a) dramatic changes in sleep disturbance and higher insomnia, particularly during lockdown; b) fear of virus contagion, c) fear of death; d) uncertainty, and e) excessive preoccupation related to local earthquakes and pandemic.

CONCLUSION: These results contribute to a better understanding the degree to which patterns in sleep disturbance changed. Future investigators may need to take into account the impact of natural disasters and pandemic-related changes in sleep disturbance as well as other behavioral and psychological symptoms.

Funding: Supported by the Ponce Health Sciences University-Moffitt Cancer Center Partnership (CA 163068 and CA 163071) from the National Cancer Institute

IRB/IACUC approval number: Advarra MCC#20086 (Pro00034140).



COVID-19 PANDEMIC STRESSORS AND PARENTAL DIFFICULTIES IN EMOTION REGULATION IN PUERTO RICO

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PURPOSE: The COVID-19 pandemic introduced new life stressors that post an increased risk of mental health symptoms for families. Emotion regulation (ER) refers to processes by which an individual adaptively copes with different daily life situations. ER can be a risk factor of various forms of mental health conditions that could be exacerbated by life stressors. The current study aimed to determine the effects of COVID-19 stressors on difficulties in ER among Puerto Rican parents of children aged 3-17 years.

METHODS: We administered an online survey between April 2022-February 2023. 265 parents completed the survey. We used a scale developed by the NIH-ECHO COVID-19 Task Force to assess COVID-19 stressors and the Difficulties in Emotion Regulation Scale to evaluate ER.

RESULTS: Most parents were women ($n = 153, 93.9\%$). We used hierarchical multiple regression to assess COVID-19 stressors to predict ER, adjusting for parental age, adversity, and mental health history. As step 1, age, adversity, and mental health history explained 23.6% of the variance of ER. After entering COVID-19 stressors as step 2, the variance explained by the whole model was 27.2%, $F(4, 260) = 24.225, p < .001$. In the final model, COVID-19 stressors ($\beta = .20, p < .001$), and adversity ($\beta = .16, p = .003$) were statistically significant.

CONCLUSION: COVID-19 stressors could significantly increase parental difficulties in ER. Health care professionals should identify those at elevated risk of COVID-19 stressors when providing physical and mental health care. These findings may lead to the development of interventions to ER coping skills to mitigate the long-term sequelae of COVID-19.

Funding: None

IRB approval number: SUMMER-21-17.



RESEARCH READINESS ASSESSMENT FOR BUILDING PBRN INFRASTRUCTURE IN PUERTO RICO

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PURPOSE: As part of the planning process for the establishment of a Practice Based Research Network (PBRN) in Puerto Rico, we conducted an exploratory research readiness assessment to better understand the research experience among members of the PR Association of Primary Care Providers (ASPPR, by its acronym in Spanish).

METHODS: A research readiness questionnaire was developed including 47 questions to gather patients' demographic information and centers' experience with community collaborations, use of electronic records, and research participation. Likert scales were used to assess readiness and perceived barriers to conduct research at their sites. The survey was developed in REDCap and distributed via email through the collaboration with the ASPPR. Data was collected from June 16 to July 30, 2022 with a response rate of 43% (7/21 centers). Descriptive analysis was done using SPSS VS.28.

RESULTS: All responders indicated having experience in community collaborations and expressed interest in research. However, only two centers (29%) indicated being ready to begin involvement in research activities. The main barriers identified were lack of interest in the faculty, limited time for research, and lack of knowledge about research methodologies. The main needs, priorities, and challenges were shared with key informants to develop a plan and formally address the findings.

CONCLUSION: Internal and external barriers and needs were identified to develop a common research agenda and perform best PBRN practices. PBRNs offer a great opportunity to address identified needs and develop long-standing collaborations to promote research initiatives to improve the practices and the communities.

Funding: This research was supported by the award number U54GM133807.

IRB/ IACUC approval number: IRB Number: 2290034094A001.



NEEDS ASSESSMENT: INSTITUTO PSICOPEDAGÓGICO DE PUERTO RICO

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PURPOSE: Conduct a needs assessment to identify areas of service and opportunities to provide services for people with intellectual disabilities.

METHODS: Mixed methods and triangulation of data to raise the information through secondary data, document review, key-informants and funding scan.

RESULTS: Secondary data: In 2018, the prevalence of disability in Puerto Rico was 21.7% and in working age was 18.2%. Despite the employment rate was 23.5% for people with disabilities, the median income for households was \$20,200. The poverty rate for working-age people with disabilities was 48%. Document Review: Six laws were identified, which offer protections, rights, and obligations towards this population; and 9 laws on education and the provision of services from early childhood to adulthood. Key-informants: Eight key informants were interviewed who identified 40 strategies that were prioritized: more day centers, social integration, awareness, volunteering, alliances, accessibility, training, technology, adapted physical education, “Respiro”, legal tutoring, sustainability of funds. Funding scan: Identify more money from more diverse sources, that are multi-year, both from public and private sources.

CONCLUSION: There is a lack of epidemiological data on this population in PR. PR already has local and federal laws that ensure the safety and well-being of this population. However, there are areas of opportunity to serve the adult population with intellectual disabilities. Society must be educated about what intellectual disability is and further promote the integration of this people in society and in workspaces. Multi-year funding can be identified to expand services to people with intellectual disabilities in PR.

Funding: Ángel Ramos Foundation. Thanks to Community Outreach Core for their support (National Institute of General Medical Sciences National Institutes of Health U54GM133807).

IRB/IACUC approval number: This study is IRB exempt.



ROUTINE CHECKUP WITHIN THE PAST YEAR FOLLOWING A HURRICANE AMONG LATINO ADULTS

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PURPOSE: The effect of disaster exposure on health care access is understudied, particularly for Latino populations. This study compared the rate of routine care following a hurricane for Latino adults.

METHODS: We analyzed the Behavioral Risk Factor Surveillance Survey for persons 18 years of age or older that self-identified as Latino (n = 54,113). We compared exposure to a category 3 or greater hurricane in Puerto Rico (2017 Irma, Maria) Texas (2017 Harvey), and Florida (2017 Irma, 2018 Michael) with states that had a category 1-2 hurricane make landfall from 2014 to 2019 (Georgia, Louisiana, Mississippi, North Carolina, and South Carolina). The outcome was a binary indicator of getting a routine checkup within the past year. Margins were generated from multivariate logistic regression that accounted for survey design effects and control variables (age, sex, marital status, presence of children in the household, education, employment status, income, health insurance, general health).

RESULTS: In 2016, there was an increase in routine checkup for Latino adults living in Puerto Rico (4%) and Florida (5%) and no change in Texas compared to 2015. In 2017, there was a decrease in routine checkup for Latino adults living in Puerto Rico (-4%), Texas (-2%), and Florida (-1%). By 2018, the estimate for routine checkup increased for Puerto Rico (5%), Texas (9%), Florida (4%). By contrast, routine checkup increased in category 1-2 states from 2017-18.

CONCLUSION: Major hurricanes in 2017 were associated with a decrease in routine care for Latino adults, but this rebounded the following year.

Funding: National Institute on Minority Health and Health Disparities 1R01MD016426.

IRB/ IACUC approval number: The Drexel University institutional review board determined that the study was exempt because it used publicly available data without personal identifiers.



PUERTO RICO HEALTHCARE SYSTEM RESILIENCE FOLLOWING FOUR MAJOR PUBLIC HEALTH EMERGENCIES

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PURPOSE: Puerto Rico (PR) has experienced a rise in major public health emergencies during recent years, including hurricanes, earthquakes, and infectious disease outbreaks. Our NIH-funded study aims to understand the impact of these disasters on the PR healthcare system and its ability to prepare, respond, and recover.

METHODS: Using a multi-level, multi-methods approach, we use annual public insurance claims data from the PR Health Insurance Administration to model cumulative disaster trends and health care utilization, key informant interviews guided by the Health System Resilience Checklist with a sample of health system leaders to understand their challenges and response approaches during each disaster, and a representative survey of Puerto Ricans to determine patient-level experiences, barriers, and access to care during and after the different disasters.

RESULTS: We obtained secondary claims data, established ongoing relationships with informants from the PR Hospital Association, Primary Care Association, and multiple federally-qualified health centers for feedback on the approach and design of the focus group and interview questions, and developed a survey questionnaire to determine the structures of care (provider, service, and infrastructure capacity), processes of care, patient experiences, and health care utilization.

CONCLUSION: Our study provides a unique opportunity to model the cumulative effects of different types of major back-to-back disasters on healthcare system resilience. This understanding will yield recommendations for an effective and coordinated approach to mitigation, preparedness, response, and resiliency.

Funding: This study is being funded by the National Institute on Minority Health and Health Disparities (NIMHD; R01MD016426 and R01MD013866) at the National Institutes of Health (NIH).

IRB/ IACUC approval number: The University of Puerto Rico IRB protocol number is 2290035239.



IDENTIFYING LANGUAGE DELAY IN INFANTS EXPOSED TO COVID-19 IN UTERO

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PURPOSE: Studies have suggested that exposure to COVID-19 during pregnancy may cause adverse effects on the infants' neurodevelopment. Delays in motor function and language have been reported. The purpose of this study is to compare maternal self-report of their infants' communication skills with a formal developmental evaluation.

METHODS: Subjects studied were infants, whose mothers had COVID-19 infection during pregnancy, enrolled in a neurodevelopment follow-up study. The Ages and Stages questionnaire (ASQ-3) was completed by mothers and the Bayley-III test was performed by a psychologist at 12-18 months of age. Statistix 8.0 was used for statistical analysis. IRB approved.

RESULTS: Subjects included 38 infants with a mean gestational age of 38 weeks (range 29-42) and a mean weight of 3107 grams (range 1000-4485), 63% males. Infants were predominantly born at term (89%). The ASQ-3 questionnaire at 12 and 15 months identified communication delay in 6% of infants while the 18 months ASQ identified delay in 19%. The Bayley-III test showed severe delay in language in 18% of infants. Severe language delay was not associated to prematurity ($p=NS$).

CONCLUSION: Mothers of infants exposed to COVID-19 in utero were able to identify infants' communication delays at 18 months of age at a similar rate as the formal Bayley- test did at 12-18 months. Although the Bayley-III test can detect language delay earlier and reliably, the 18-month ASQ-3 screening questionnaire is a tool that can be used when a formal evaluation by a specialist is not available.

Funding: N/A.

IRB Approval number: 2020320.



POLICY IMPLICATIONS ON COVID-19 TESTING IN LOW-RESOURCED AND SOCIALLY VULNERABLE OLDER ADULTS IN PUERTO RICO.

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PURPOSE: The study aims to focus on the elderly communities in PR who are disadvantaged by geography, sexual/gender identification, homelessness and/or income to understand health disparities.

METHODS: A multi-method approach was employed to attain a comprehensive understanding of policies, practices, and program available for vulnerable older adults. A systematic policy review on federal and territorial programs/policies enacted between 2020-2022 was performed and semi-structured with key informant interviews were conducted with end-users, implementers, and policy makers to examine policy and practices change efforts following the COVID-19.

RESULTS: 24 interviews were conducted including: 9 end-users, 9 implementers, and 4 policy makers. End users included: 89% women, 56% 65 years old or plus, 56% had some college education, 67% live under poverty and 33% live geographically isolated. Systematic Policy review yield that PR's government issues 84 Administrative and 75 Executive Orders, and 10 laws between March 2020-December 2022 mostly focus on strategies to minimize the risk of COVID-19 infection to general population. Key informants perceive that although multiple efforts have been made by local government and service providers to provide access to COVID-19 testing these need to be maximized for those who live in geographically isolated communities, alone, do not have transportation, or have a health condition that limits their mobility.

CONCLUSION: Public policy efforts are needed to promote access to COVID-19 tests for older adults living in disadvantaged conditions: geo-located data to identify location of older adults who cannot access testing sites, and availability, awareness, and education for home testing.

Funding: NIH/NIMHD - Puerto Rico Community Action Research and Engagement (PR-CARE) to Eliminate Disparities in Diagnostic of COVID-19 among Rural Underserved and Vulnerable Populations (U01MD01742) & NIH/NIGMS - Hispanic Alliance for Clinical and Translational Research (1U54GM133807-01A1).

IRB approval number: Medical Science Campus IRB – A7080122.



COMMUNITY CONSULTATIONS AND MULTILEVEL STRATEGIES POLICIES AND PROGRAMS TO CATALYZE RESEARCH TO IMPROVE POPULATION HEALTH

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PURPOSE: The Community Outreach and Engagement Core aims to increase multi-sectorial collaborations needed to improve population health among Hispanic communities in Puerto Rico by accelerating and supporting the development of meaningful Community-Academic Partnerships. During 2021-2022 research plans focused on organizing community forums to enhance and maintain community participation in research and aligning research action plans to comply with the identified priorities.

METHODS: We triangulated community-level epidemiological data, community readiness, resources and capacity following the Colorado State University's Tri-ethnic Center Model, and the Delphi Technique.

RESULTS: We conducted 8 forums with 223 individuals from 51 municipalities. Most of the participants were females (79%), a mean age of 25-67 - including citizens/patients, researchers, advocates, providers, and community leaders related to homelessness, trauma, gender, and/or sexual identity discrimination, isolated communities, migrants, and people with diverse functionality. In collaboration with the Community Health & Research Council - composed by 20 community stakeholders that represent vulnerable subpopulations - researchers and community Alliance leaders and co-leaders health priorities were discussed, and a comprehensive list of strategies -at program-policy-practice levels- were elaborated to align research initiatives addressing community health and research decision-making. Priority results highlight the need to catalyze efforts to improve continuous data collection/sharing, mental health and substance use treatment/services, lack of access to care and multidisciplinary health approaches, and discrimination by migration status, gender, or sexual orientation.

CONCLUSION: There is a need to leverage resources for community engagement and bridging capacity to stimulate research to address primary health needs and with mentoring, education, and dissemination.

Funding: Acknowledgment of grant support: Research reported in this publication was supported by the National Institute of General Medical Sciences (NIGMS)– National Institutes of Health under the Award Number U54GM133807. IRB/ IACUC approval number: RCM IRB-A2210120.



ATTITUDES, BELIEFS, BARRIERS, AND FACILITATORS REGARDING THE COVID-19 VACCINE IN 4 RURAL COMMUNITIES OF PUERTO RICO

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PURPOSE: To examine and identify attitudes, beliefs, perceived barriers, and facilitators of vaccination against COVID-19 (C-19) in rural communities through participatory action research between the Castañer General Hospital (CGH) and the Medical Sciences Campus.

METHOD: During May-June 2022, a questionnaire was administered to 100 adult residents of 4 rural communities of Adjuntas, Jayuya, Maricao and Lares-Castañer. We explore attitudes, beliefs, barriers, and facilitators regarding C-19 inoculation, as well as general sociodemographic characteristics.

RESULTS: The majority identify with the female gender (76%), with an average age of 48.21 years and (52%) with a degree after high school. An (82%) have received at least one dose of the booster vaccine. The majority (70%) presented moderate/high levels of confidence regarding the vaccines against COVID-19 and 99% have knowledge about where to get vaccinated. A handful (1%) refuse the vaccine for medical reasons.

CONCLUSION: The results suggest generally positive attitudes and beliefs about COVID-19 vaccines, and that vaccination is accessible in the rural communities studied. Among the barriers for which the respondents have yet to receive the vaccine are: mistrust, medical reasons and unawareness of vaccination sites.

Funding: This research was supported by a grant from the National Institutes of Health from the Puerto Rico Community Engagement Alliance Against COVID-19 Disparities (PR-CEAL)

(OT2HL161827) and the Hispanic Alliance for Clinical and Translational Research (The Alliance) with support from the National Institutes of Health of the National Institute of General Medical Sciences (NIGMS-U54GM133807).

IRB approval number: A7080121.



CHILDHOOD BLOOD LEAD SURVEILLANCE IN PUERTO RICO, 2021-2023

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PURPOSE: In September 2021, a surveillance for blood lead levels (BLLs) among children ≤ 16 years old was implemented in Puerto Rico to collect data on all blood lead tests and investigate those cases with levels above the blood lead reference value (≥ 3.5 $\mu\text{g}/\text{dL}$).

METHODS: The surveillance system received BLL test reports through the National Electronic Disease Surveillance System (NEDSS) Base System (NBS). Telephone interviews were conducted to collect sociodemographic and clinical information and to determine possible sources of lead exposure for children with a BLL ≥ 3.5 $\mu\text{g}/\text{dL}$. Central tendencies analysis for continuous variables and frequency statistics and percentages for categorical variables were calculated.

RESULTS: During September 2021 through January 2023, 19,731 blood lead tests were reported. A total of 102 (0.52%) children were identified with BLLs ≥ 3.5 $\mu\text{g}/\text{dL}$; 54 (53%) were male and median age was 3 years. Among the 102 children, 52 (51%) had confirmed blood levels in the 3.5-4.9 $\mu\text{g}/\text{dL}$ range, 39 (38%) had levels in the 5-10 $\mu\text{g}/\text{dL}$ range, and 11 (11%) had levels in the >10 $\mu\text{g}/\text{dL}$ range. The Fajardo health region reported the highest rate of childhood lead poisoning among children <5 years with 24 cases per 10,000 children. Occupations and hobbies related to lead (57%) and living in a building built before 1978 (24%) were the most reported sources of lead exposure.

CONCLUSION: Blood lead surveillance is a useful tool to identify and monitor children at higher risk and aid them to access lead poisoning prevention services.

Funding: 21NUE2EH001415 Childhood Lead Poisoning Prevention and Surveillance of Blood Lead Levels in Children.

IRB/IACUC approval number: Public health surveillance activity are deemed not to be research and do not require IRB review.



CLINICAL AND DEMOGRAPHIC PROFILE OF WOMEN WITH UTERINE FIBROIDS LIVING IN PUERTO RICO

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PURPOSE: Uterine leiomyomas represent the most common benign tumor in women of reproductive age. Given the epidemiologic significance and health concerns that can arise from the development of uterine fibroids, our primary goal is to determine the profile of uterine fibroids among women in Puerto Rico.

METHODS: Clinical, menstrual cycle characteristics and demographic data were collected from self-administered questionnaires in various gynecologic clinics in Southern Puerto Rico. We used means, standard deviations, and t-tests for continuous variables and frequencies, percentages, and X^2 for categorical variables. Statistical significance was $P < 0.05$.

RESULTS: We identified 312 cases of uterine fibroids from 1610 cases in the database, for an estimated point prevalence of uterine fibroids of 19.4% in our study cohort. The average age at menarche was 12 years old, with the majority of cases between 12 to 13 years of age. Menstrual cycle length was between 27-30 days, mostly regular, and period length was 5.9 days on average. Average primiparous age was 22.14 years, 40.71% had 2-3 pregnancies, and 26.28% reported miscarriages. Symptomatology included dysmenorrhea, incapacitating pain, problems conceiving, and dyspareunia. Comorbidities included ovarian cysts, abnormal uterine bleeding, gynecological infections, and abnormal Pap smear.

CONCLUSIONS: This study assessed the basic epidemiology and reproductive characteristics of women with uterine fibroids in Puerto Rico for the first time. Future studies are needed to identify risk factors that might play a role in the development of uterine fibroids with the ultimate goal of treating, managing, and initiating primary preventive measures.

IRB approval number: EMSJBIRB-12-2022.

Published by:

PRHSJ
Puerto Rico Health Sciences Journal

for the

12th Scientific Day 2023 of the

Hispanic Alliance for Clinical and Translational Research

University of Puerto Rico Medical Sciences Campus, San Juan, PR

Ponce Health Sciences University, Ponce, PR

Universidad Central del Caribe, Bayamón, PR