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ABSTRACT SUPPLEMENT

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Editorial

CLIMATE CHANGE, HEALTH DISPARITIES AND EQUITY

Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates. This change can be the result of natural phenomena, including cyclical ocean patterns like El Niño, La Niña and the Pacific Decadal Oscillation, volcanic activity, and variations in in the Earth's orbit or the Sun's energy output[1]. However, data demonstrate that the main driver of climate change is human activities, such as transportation (27%), energy generation (25%), industry (24%), commercial and residential buildings (13%), as well as industrialized agriculture and livestock production (11%)[1]. These activities collectively increase atmospheric gases that "trap" heat, a phenomenon known as "green-house effect", which is responsible for the global warming.

Climate change poses increasing threats to human health, including temperature-related illness and deaths, impact on air quality, vector-born diseases, water-related illness, food security and safety, mental health and well-being, and an increase in extreme events[2]. Over the past two decades the world has experienced an increase in the frequency, intensity, and geographical distribution of extreme weather events, such as heatwaves, hurricanes, floods, and others; these are projected to increase by 40% between 2015 to 2030[3]. In 2022 the Emergency Event Database EM-DAT reported 387 natural hazards and disasters worldwide, which affected 185 million individuals and resulted in 30,704 deaths[3].

As the temperatures on the planet continue to increase, the risks to human health will grow, exacerbating existing health threats and creating new public health challenges[4]. However, not all communities and populations face the same health risks from such events. *Certain groups, like children, the elderly, the underserved and communities of color, are less climate-resilient and, therefore, more vulnerable to the negative health effects of climate change*[5]. Climate change has been shown to exacerbate existing health and social inequities, such as pre-existing health conditions, poor living conditions, food insecurity and access to health care. Therefore, addressing health disparities and the social and structural inequities that lead to them is critical for reducing individual and community vulnerability to climate change, and for building climate and health equity and resilience across populations and communities in the world.

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Abstracts*

EXPERIENCING EXTREME HEAT INFLUENCE PERCEPTIONS ABOUT CLIMATE CHANGE AMONG CANCER PATIENTS AND CAREGIVERS.

Tanialy Rivera, MS[1]; Nancy Cardona, DrPH[1]; Jeslie Ramos, MS[1]; Pablo Méndez, PhD[1,2]; Ana P. Ortiz, PhD[1,2]
[1]University of Puerto Rico Comprehensive Cancer Center;
[2]University of Puerto Rico Medical Sciences Campus

INTRODUCTION: Climate change (CC) consequences, such as more extreme heat periods have increased in recent years, being 2023 the hottest year ever recorded. Heat events can significantly impact cancer patients' outcomes.

OBJECTIVE: We assessed attitudes towards CC among cancer patients/survivors and caregivers in Puerto Rico (PR) and differences by experiencing extreme heat events.

METHODS: A cross-sectional study was conducted (April-August 2023), among cancer patients/survivors and caregivers, aged ≥21 years old and living in PR (n=574). Eligible participants completed a survey that collected relevant study variables, including information on 15 attitudes towards CC. The main predictor variable was impact of extreme heats in your residence, community or both in the last 10 years (Yes/No). Descriptive statistics were used to describe the study population. Logistic regression models evaluated the association between reported extreme heat impact and the specific CC attitudes.

RESULTS: Our sample were mostly cancer patients/survivors (71.8%), women (82.0%) and their median age was 56 years. The majority thought that CC information is important to them (98.7%). After adjusting for age, gender, education and participant type, individuals who reported impacts from extreme heat were more likely to support that each individual should take action to reduce the impact on CC (OR=6.79, 95%CI=1.41-32.69) compared to their counterparts.

CONCLUSIONS: This is the first study to assess the role of experiencing extreme events on attitudes towards CC among cancer patients/survivors and caregivers in PR. Results allow the development of targeted interventions to increase awareness about CC and its impact on the cancer control continuum.

Funding: This project was supported by the NOAA CAP/RISA Caribbean Climate Adaptation Network (CCAN) (Grant # NA22OAR4310545).

IRB approval number: The University of Puerto Rico Comprehensive Cancer Center's Institutional Review Board (IRB) approved the study (Protocol #202304101) as exempt since no identifiers were collected. Participants received the project's information sheet before completing the questionnaire.

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

APPLYING THE CLIMATE AND ECONOMIC JUSTICES SCREENING TOOL TO DETERMINE PRIORITY FOR CANCER PREVENTION EFFORTS IN PUERTO RICO.

Nancy Cardona, DrPH[1]; Ilandra Guadalupe, BS[2]; Nayelis Lorenzo[3]; Ana P. Ortiz PhD[1,2].
[1]University of Puerto Rico Comprehensive Cancer Center;
[2]University of Puerto Rico Medical Sciences Campus,
[3]University of Puerto Rico Aguadilla Campus

INTRODUCTION: Globally, between 7%-19% of cancers are attributed to environmental exposures. Puerto Ricans are an under-resourced, low-income Latino population whose second leading cause of death is cancer, who live across high density of contaminants sites and are vulnerable to experiencing multiple climate disaster events.

OBJECTIVE: We assessed the most vulnerable areas to environmental exposures across Puerto Rico (PR).

METHODS: An ecological spatial analysis was conducted using databases from PR Central Cancer Registry and US Environmental Protection Agency. We applied the Climate and Economic Justices Screening Tool which provides census tracts that are overburdened and underserved. Integrating this information we created illustrative maps using QGIS v3.34.3 to identified higher cancer at-risk communities.

RESULTS: The clusters of most concern (legacy pollution) were identified around the 26 superfunds sites designated across PR (n=7). The main cluster of concern includes 100 census tracks located in northern and central areas. Secondary clusters of concern include 20 to <100 census tracks located in in the southeast coast (2 sites) and the southwest coast (1 site). The clusters with less than 20 census tracks are located in the central east (2 sites) and south (1 site). Across clusters of vulnerable population to environmental superfund compounds, other disadvantages were observed such as energy, workforce development, housing, and climate change effects. Four clusters were identified with least environmental concern.

CONCLUSIONS: This project helps identify sectors at increased risk of cancer due to potential exposure to superfund sites in PR, information that is essential for future research and mitigation efforts.

IRB approval number: This study was approved by the UPR Comprehensive Cancer Center Institutional Review Board, Protocol #2023-11-124.

RISK OF CARCINOGEN DISPERSION IN RELATION TO CLIMATE DISASTERS IN ARECIBO, PUERTO RICO.

Ilandra Guadalupe, BS[2]; Ana P. Ortiz; PhD[1,2]; Nayelis Lorenzo[3]; Nancy Cardona, DrPH[1].
[1]University of Puerto Rico Comprehensive Cancer Center;
[2]University of Puerto Rico Medical Sciences Campus,
[3]University of Puerto Rico Aguadilla Campus

INTRODUCTION: Trichloroethylene (TCE), a carcinogen compound, has been detected in Arecibo's groundwater system. Exposure to TCE is a risk factor for Kidney Cancer and Non-Hodgkin lymphoma, two cancer types with a high incidence in Arecibo.

OBJECTIVE: We defined and evaluated geographical areas where the density of superfund sites is significantly higher in Arecibo, Puerto Rico and considered the primary water systems in the area to determine the potentially vulnerable communities to TCE.

METHODS: An ecological spatial analysis was conducted using databases from the Puerto Rico Central Cancer Registry, US Census Bureau, US Environmental Protection Agency and the US Geological Survey. We integrated the information to create descriptive maps of potential exposure in floods events using QGIS v3.34.3.

RESULTS: Arecibo is a coastal municipality with 125.9 square miles of land area, two river systems and one wetland. Approximately 87,574, mostly Hispanics live in Arecibo, 38% self-identify as females. Arecibo's median household income is 25,016$ and 7.5% of the population lives without health care coverage. The neighborhoods with a higher risk of TCE exposure are Cambalache, Domingo Ruiz, Islote, Carreras, Santana y Tanamá.

CONCLUSIONS: To our knowledge, this is the first study to explore the risk of TCE exposure across communities in Arecibo, in relation to potential flooding, by combining historical data. Timely sensitive studies should be conducted to confirm the extent of TCE across water systems in Puerto Rico.

IRB approval number: This study was approved by the UPR Comprehensive Cancer Center Institutional Review Board, Protocol #2023-11-124.

UNVEILING DISPARITIES IN PRIMARY LIVER CANCER: INSIGHTS FROM COMPREHENSIVE ANALYSES OF HISPANIC PATIENT OUTCOMES

Marcel Grau Rodríquez, BS[1]; Patrick L. Quinn, MD[2]; Kunika Chahal, MPH[3]; Shah Saiyed, BS[2]; Goutam Gutta, BS[2]; Connor Hannon, MHI[2]; Angela Sarna, BS[2]; Alex Kim, MD, PhD[2]; Mary Dillhoff, MD[2]; Jordan M. Cloyd, MD[2]; Timothy M. Pawlik, MD, MPH, PhD[2]; Aslam Ejaz, MD, MPH[2].

[1]Universidad Central del Caribe School of Medicine, Bayamón, Puerto Rico;
[2]The Ohio State University Wexner Medical Center, Columbus, Ohio;
[3]SUNY Downstate College of Medicine, Brooklyn, New York

INTRODUCTION: Hispanics constitute 19% of the U.S. population, facing elevated risks of primary liver cancers, such as hepatocellular carcinoma (HCC) and intrahepatic cholangiocarcinoma, raising concerns about healthcare equity. However, routine reporting may obscure disparities among subpopulations.

METHODS: Research from 2004-2023 utilized the National Cancer Database and the Surveillance, Epidemiology, and End Results Program. Studies excluded liver metastases or secondary cancers. Detailed coding for Hispanic ethnicity (Non-Hispanic, Mexican, Puerto Rican, etc.) was used. Eligible studies underwent assessment for reporting of race and Hispanic ethnicity. Focused on HCC patients from 2004-2020, aiming to disaggregate Hispanic patients by race and heritage to identify disparities. Outcomes included HCC stage, treatment, and overall survival.

RESULTS: Of 1,476 studies, 670 met inclusion criteria. Within this cohort, 88.7% included race/ethnicity as a covariate, with Hispanic ethnicity reported in only 30.1%. Notably, none disaggregated Hispanic ethnicity by race. Among 199,190 patients, 12.5% identified as Hispanic. Hispanics, predominantly White (91.1%), displayed marked differences in presentation, treatment, and outcomes. They had greater odds of early-stage HCC but were less likely to undergo curativeintent procedures (OR = 0.88; $p < 0.001$). Disaggregated by heritage, Mexican (HR 1.14; $p = 0.044$), Dominican (HR 0.65; $p = 0.025$), and Hispanic-other patients (HR 1.08; $p = 0.019$) had worse Overall Survival compared with Non Hispanic Whites.

CONCLUSION: The study underscores disparities in primary liver cancer outcomes among Hispanic patients, emphasizing the need for future studies to avoid aggregating. Addressing these disparities is crucial for accurate healthcare representation and promoting equitable care for Hispanic populations.

Funding: N/A

IRB approval number: This project is IRB exempt.

UNVEILING BARRIERS TO CANCER CARE ACCESS: EXPLORING CLINICAL AND SOCIODEMOGRAPHIC DISPARITIES

Lorena González-Sepúlveda, MS[1]; Mariela Bournigal-Feliciano, MPH[1]; Sofía Contreras-Fernández, BS[1,2]; Karina Torres-Mojica, BS[1]; Rocío Avilés-Mercado, BS[1]; Juan González-Mayoral, BS[1]; Valeria Acevedo-Matos[3]; Nancy R. Cardona-Cordero, DrPH, MS[1]; Marievelisse Soto-Salgado, MS, DrPH[1].

[1]University of Puerto Rico Comprehensive Cancer Center, San Juan, PR;
[2]University of Puerto Rico Medical Sciences Campus, Graduate School of Public Health, San Juan, PR;
[3]University of Puerto Rico Medical Sciences Campus, School of Nursing, San Juan, PR.

INTRODUCTION: Timely access to diagnosis and treatment are crucial for enhancing survival and quality of life among cancer patients. Our study aimed to identify barriers to accessing cancer treatment and explore their association with patients' selected characteristics.

METHODS: In this ongoing cross-sectional study, cancer patients aged 21+ years, who received active treatment within the past year and resided in PR, completed a survey either online or at medical clinics (n=153). Accessing cancer treatment was defined as self-reported difficulties to initiate or continue cancer treatment. Data were analyzed using descriptive statistics. Contingency tables were generated to assess the relationship of access to cancer treatment and selected characteristics.

RESULTS: Most participants were women (72.6%), unemployed (68.8%), lived at urban/suburban areas (66.0%), and have multimorbidity (71.2%). The mean age was 58.1±12.2 years. Approximately 33.3% of participants experienced at least one barrier to accessing cancer treatment, with the most common barriers including health insurance problems (37.3%), lack of communication with healthcare providers (27.5%), and financial issues (25.5%). Barriers to accessing cancer treatment were more likely to occur among women (37.8% vs. 21.4%; p=0.06), and those with multimorbidity (39.5% vs.18.2%; p=0.01) than their counterparts. Additionally, barriers to accessing cancer treatment were mainly observed among those with lower cancer stages (localized:31.3%, regional:48.6%, distant:18.8%; p=0.07).

CONCLUSION: In PR, cancer patients facing challenges to access treatment are mainly affected by health insurance problems, lack of communication, and financial issues. Further studies should evaluate cancer patients' experiences when seeking treatment and to develop targeted cancer care plans.

IRB approval number: This project was approved by the Institutional Review Board of the University of Puerto Rico Comprehensive Cancer Center (IRB # 2023-11-123).

ADDRESSING FINANCIAL TOXICITY AND ASSOCIATED FACTORS AMONG HISPANIC CANCER PATIENTS IN PUERTO RICO

Marievelisse Soto-Salgado, MS, DrPH[1]; Sofía Contreras-Fernández, BS[1,2]; Lorena González-Sepúlveda, MS[1]; Mariela Bournigal-Feliciano, MPH[1]; Karina Torres-Mojica, BS[1]; Rocío Avilés-Mercado, BS[1]; Juan González-Mayoral, BS[1]; Valeria Acevedo-Matos[3]; Nancy R. Cardona-Cordero, DrPH, MS[1].

[1]University of Puerto Rico Comprehensive Cancer Center, San Juan, Puerto Rico;
[2]University of Puerto Rico Medical Sciences Campus, Graduate School of Public Health, San Juan, Puerto Rico;
[3]University of Puerto Rico Medical Sciences Campus, School of Nursing, San Juan, Puerto Rico.

INTRODUCTION: Financial toxicity (FT) describes problems a cancer patient has related to the cost of medical care, including subjective financial concerns. We aimed to assess FT and associated factors among cancer patients in Puerto Rico (PR).

METHODS: We are conducting a cross-sectional study through an online survey among cancer patients aged 21+ years who have received active cancer treatment during the last year. We utilized the COST-FACIT questionnaire to measure low (score≥21) and high (score<21) FT. Cronbach's alpha was used to assess internal consistency.

Univariate (ULRM) and multivariate logistic regression models (MLRM) were used to determine factors associated with FT. MLRM included significant variables in the ULRM ($p<0.10$) and predictors supported by scientific literature.

RESULTS: As of February 6, 2024, 221 people accessed the survey, with 152 (68.8%) completing it. Participants' mean age was 58.2±12.1 years, most were female (73.7%), had annual income < $25,000 (56.7%), and had public health insurance (31.3%).

COST-FACIT demonstrated good internal consistency (alpha=0.83). About 47.4% of participants had high FT (overall FT mean score = 21.0±9.2). Decreasing age (OR: 0.97; 95%CI, 0.95-1.00) and type of health insurance (OR public vs. private: 3.42, 95%CI: 1.47-7.98) were associated with higher FT in the ULRM. However, in the MLRM, only the type of health insurance (OR public vs. private: 2.82, 95%CI: 1.12-7.11) remained significantly associated with higher FT.

CONCLUSION: FT is higher among cancer patients with public health insurance. Further research is needed to identify and evaluate interventions to address FT of cancer treatment among Hispanic/Latino patients.

IRB approval number: This project was approved by the Institutional Review Board of the University of Puerto Rico Comprehensive Cancer Center (IRB # 2023-11-123).

EPIDEMIOLOGICAL AND BIOLOGICAL DISPARITIES ASSOCIATED WITH OROPHARYNGEAL CANCERS IN HIV INFECTION

Juliana Serrano-Rodríguez, BSc[1,2]; Carlos A. Solá-Morlá, BSc[1,3]; Yakshi N. Ortiz-Maldonado, MS[1]; Gabriel Borges-Velez, PhD[1]; Jurelis Torres-Reyes, MS[1]; Jeannette L. Salgado-Montilla, MS, MT[1]; Maria M. Sanchez-Vazquez, MS[1]; Magaly Martinez-Ferrer, PhD[4]; Ana P. Ortiz-Martinez, MPH, PhD[1]; Ramon F. Gonzalez-Garcia, DDS, MPH[5]; Josué Pérez-Santiago, PhD[1,5].

[1]Division of Clinical and Translational Cancer Research - University of Puerto Rico Comprehensive Cancer Center, San Juan, PR, [2]Division of Science and Technology - University Ana G. Mendez, Carolina, PR, [3]School of Medicine - Universidad Central del Caribe, Bayamón, PR, [4]School of Phamacy, University of Puerto Rico Medical Sciences Campus, San Juan, PR, [5]School of Dental Medicine, University of Puerto Rico Medical Science Campus, San Juan, PR.

INTRODUCTION: Even with suppresive antiretroviral therapy, people with HIV (PWH) are disproportionately afected by HPV infection, a major factor for oropharyngeal cancers. Puerto Rico (PR) has disparities for both HIV infection and HPV-related malignancies, and has socio-economic disadvantages, which could further increase cancer risk.

METHODS: We collected saliva, oral rinse, sociodemographic, clinical and lifestyle variables, and evaluated periodontal disease (PD) status from 117 sexually active PWH. Oral rinse was analyzed for HPV infection and genotype. In a subset of participants (n=48), we characterized the oral bacteriome (16s rDNA), and quantified short-chain fatty acids (GC-MS). Analyses were performed using QIIME2 and R-statistical software.

RESULTS: The prevalence of oral HPV infection was 29.9%, of which 70% were high-risk genotypes, and HPV-18 was the most abundant (27.5%). There was also a high prevalence of PD of 82%. HPV+ participants had significantly higher abundance of *Dialister* and *Nanosynbacter* and lower abundance of *Rothia* and *Capnocytophaga*. Higher microbial richness was associated with lower levels of acetate ($r=-0.35$, $p<0.05$) and propionate ($r=-0.31$, $p<0.0$). Additionally, higher phylogenetic diversity was associated with lower levels of acetate ($r=-0.38$, $p<0.05$) and propionate ($r=-0.35$, $p<0.05$). Conversely, higher levels of butyrate were significantly associated with higher microbial diversity (Shannon index; $r=0.33$, $p< 0.05$).

CONCLUSIONS: The prevalence in high-risk HPV among PWH was higher than previously observed, which may explain clinical disparities concerning oropharyngeal cancer in PR. Additionally, we found specific prokaryotic profile and SCFA associated with HPV, which may suggest that the oral microbiome could influence the natural history of HPV infection.

Funding: National Cancer Institute (R21CA264606, U54CA09629 and R25CA240120) National Institute on Minorities Health and Health Disparities (RCMI Program: U54MD007600) National Institute of General Medical Sciences (Center for the Promotion of Cancer Health Equity: P20GM148324 and Hispanic Alliance for Clinical & Translational Research: U54GM133807)

IRB approval number: 2021-05-50 from the University of Puerto Rico-Comprehensive Cancer Center.

EXPLORING ETHNICITY AND SEX-BASED VARIATIONS IN GLIOBLASTOMA GENE EXPRESSION PATTERNS

Tyrel Porter, BS[1]; Ciro M. Carrillo Marcano, BS[1]; Miguel Mayol del Valle, MD[2]; Lilia Kucheryavykh, PhD[1].
[1]Department of Biochemistry, Universidad Central del Caribe, Bayamón, PR 00956, USA;
[2]Department of Neurosurgery, University of Puerto Rico, Medical Sciences Campus, San Juan, PR 00921, USA

INTRODUCTION: Glioblastoma (GBM), an aggressive form of brain cancer, has a higher incidence in non-Hispanics when compared to the US Hispanic population. Our previous studies, utilizing GBM tissue from Hispanic patients in Puerto Rico, indicated significant correlations in gene expression of PTK and PTK2B with various receptor tyrosine kinases. This study further explores these correlations found in gene expression while accounting for sex and ethnicity.

METHODS: 21 GBM specimens from clinical samples were processed to isolate GBM and tumor-associated myeloid (TAM) cells through percoll gradients and analyzed separately. RT-PCR was used to evaluate the gene expression levels of PTK (Focal Adhesion Kinase), PTK2B (Focal Adhesion Kinase 2), NGFR (Nerve Growth Factor Receptor), and PDGFRB (Platelet derived Growth factor Receptor B) in GBM cell fraction. These data were subsequently contrasted with mRNA expression data from 483 GBM specimens acquired from cBioPortal.

RESULTS: Significant correlations between PTK with NGFR as well as PDGFRB in addition to correlations between PTK2B with PTK, PDGFRB, and NGFR in Hispanic male patients did not arise in non-Hispanic male patient data. Data for Hispanic female patients showed correlations in PTK with NGFR and PDGFRB, which also did not appear in the data for non-Hispanic patients. Data acquired from cBioPortal for Hispanic patients supported correlations in PDGFRB and NGFR in females as well as PTK2B and NGFR in males.

CONCLUSION: Our findings reveal distinct correlations in gene expression patterns, particularly involving PTK, PTK2B, NGFR, and PDGFRB, among Hispanic patients compared to non-Hispanic counterparts.

Funding: PRSTRT2022 and NIH Grant 1R15CA287203

IRB approval number: Universidad Central del Caribe protocol #2012-12B.

UNCOVERING HEALTH DISPARITIES AND POLICY IMPLICATIONS FOR VULNERABLE OLDER ADULTS IN PUERTO RICO: PARTICIPATORY ACTION RESEARCH.

Acosta Pérez, Edna, PhD[1]; Sánchez Cesáreo, Marizaida PhD[1]; Noboa, Carlamarie, PhD[1]; Adames, Cristina, PhD[1]; Meléndez-González, Jean C., PhD[1]; Cartagena, William, MS[2]; Coalición de Coaliciones, Inc[3]; Coai, Inc[4]; OSaN, Inc[5]
[1]University of Puerto Rico, Medical Science Campus;
[2]Nexos, Inc.; [3]Coalición de Coaliciones Pro Personas Sin Hogar, Inc.;
[4]Coaí, Inc.; [5]Sistemas de Acueductos Non-Prasa de Puerto Rico (OSAN)

INTRODUCTION: This Participatory Action Research (PAR) study delves into the health disparities experienced by older adult communities in Puerto Rico, grappling with geographical, sexual/gender identification, homelessness, and income disadvantages.

METHODS: Employing a multi-faceted mixed-method approach, the study comprehensively investigates the policies, practices, and programs available for vulnerable older adults and their connection with the social determinants of health affecting this demographic. It unfolds in three phases: a systematic review of federal and territorial policies enacted from 2020 to 2022, semi-structured interviews with key informants (including citizens, implementers, and policymakers), and individual surveys targeting adults aged 55 and above to gauge efforts in policy and practice change post-COVID-19 and access to resources.

RESULTS: Findings from 24 interviews (9 with end-users, 9 with implementers, and 4 with policymakers) underscore the issuance of 84 Administrative Orders, 75 Executive Orders, and 10 laws by the Puerto Rican government between March 2020 and 2022, primarily focused on mitigating COVID-19 risks in the general populace. Additionally, 575 face-to-face surveys were conducted with older adults, averaging 69 years of age, across various regions of the island.

CONCLUSION: Crucially, the study advocates for the implementation of public policies that facilitate access to COVID-19-related services, notably mental health services and priority assistance for older adults confronting disadvantaged circumstances. This encompasses strategies such as pinpointing locations of older adults unable to access testing sites, providing home testing options, and imparting health education. The research aims to delve into expanding access and availability of health services for Puerto Rico's most vulnerable older adults, addressing prevalent social, ethical, and behavioral inequities.

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

EXPLORING CARDIOMETABOLIC RISK DISPARITIES BY SEX AND SEXUAL ORIENTATION AMONG HISPANIC SEXUAL MINORITIES

Caleb Esteban, PhD;
Eddiel Hernández-López, BS.
Ponce Health Sciences University/Ponce Research Institute

INTRODUCTION: Cardiometabolic risk factors significantly increase future cardiovascular diseases and diabetes. Sexual minorities, such as lesbian, gay, and bisexual+ individuals, face complex life difficulties (e.g., discrimination) that can lead to stress and other clinical psychological symptomatology associated with changes in biomarkers, including cardiometabolic alterations. The purpose of this analysis was to explore differences in cardiometabolic risk by sex (males vs. females) and sexual orientation (homosexual vs. bisexual+) among Hispanic sexual minorities.

METHODS: The team conducted a secondary data analysis using a quantitative method, cross-sectional design, from a pilot study. The analysis included data from 98 Hispanic LGB+ participants aged 21-40 years. Cardiometabolic risk was evaluated through the analysis of microalbumin in urine and a Lipid Panel.

RESULTS: Homogeneity of variances was confirmed through Levene's test for equality of variances ($p > .05$). Independent-samples t-tests were performed. Exploratory results suggested significant differences by sex, including diastolic pressure (higher in males; $p < .001$), high-density lipoprotein cholesterol (higher in females; $p < .001$), triglycerides (higher in males; $p = .023$), and high-density lipoprotein particles (higher in females; $p = .006$). However, differences between sexual orientations were not found.

CONCLUSION: Existing literature acknowledges the influence of biopsychosocial factors on cardiovascular health. Significant differences were observed based on sex, providing insights into potential sex-specific patterns in cardiometabolic health. The absence of significant differences in cardiometabolic indicators based on sexual orientation challenges previous assumptions and highlights the need to consider a more comprehensive set of determinants when assessing cardiometabolic risk among sexual minorities.

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

IRB approval number: PHSU (#2104061049)

CARDIOVASCULAR HEALTH AMONG YOUNG MEN AND WOMEN IN PUERTO RICO AS ASSESSED BY THE LIFE ESSENTIAL 8 METRICS

Cynthia M. Pérez, PhD[1]; Andrea López-Cepero, PhD[2]; Israel Almodóvar-Rivera, PhD[3]; Catarina Kiefe, PhD, MD[4]; Katherine L. Tucker, PhD[5]; Sharina Person, PhD[4]; Josiemer Mattei, PhD[6]; José Rodríguez-Orengo, PhD[7]; Milagros C. Rosal, PhD[4].

[1]Graduate School of Public Health, University of Puerto Rico, Medical Sciences Campus, San Juan, PR; [2]Rollins School of Public Health, Emory University, Atlanta, GA; [3]College of Arts and Sciences, University of Puerto Rico-Mayaguez Campus, Mayaguez, PR; [4]UMass Chan Medical School, Worcester, MA; [5]UMass Lowell Zuckerberg College of Health Sciences, Lowell, MA; [6]Harvard T.H. Chan School of Public Health, Boston, MA; [7]School of Medicine, University of Puerto Rico, Medical Sciences Campus, San Juan, PR.

INTRODUCTION: Cardiovascular health (CVH), as measured by Life's Essential 8 metrics, in young adults in the United States falls below ideal levels, with noticeable sex differences. While poor CVH in early adulthood is associated with later cardiovascular disease (CVD), research examining sex differences in CVH among young Puerto Ricans is scarce. This study compared CVH in a large cohort of young men and women residing in Puerto Rico, an understudied population where CVD prevalence in older adults is elevated.

METHODS: We examined data from 2,162 adults aged 18-29 in the PR-OUTLOOK study conducted between 2020 and 2023. CVH scores, graded on a 0 (worst) to 100 (best) scale, were derived from survey responses, physical exams, and laboratory assays. Linear regression was employed to determine adjusted means for CVH scores by sex, controlling for age, marital status, education, childhood material deprivation, subjective social status, health insurance, and depressive symptoms.

RESULTS: CVH was less-than-ideal (score<80) in 72% of the cohort (70% of women, 76% of men, $p<0.05$). Men had statistically significant lower overall mean CVH scores than women (71 vs. 73) and lower scores for nicotine exposure (78 vs. 87), non-HDL cholesterol (81 vs. 87), and blood pressure (81 vs. 92). Women had significant lower physical activity scores (50 vs. 60) compared to men.

CONCLUSION: Less-than-ideal CVH is notable among young men and women, with men having worse CVH than women. These identified sex differences warrant further investigation and the design of interventions to enhance and preserve CVH among men and women.

Funding: This research was supported by the National Heart, Lung, and Blood Institute (grant R01HL149119). The study also received support from the Hispanic Alliance for Clinical and Translational Research funding awarded through the National Institute of General Medical Sciences (U54GM133807).

IRB approval number: The study was approved by the UPR MSC IRB (protocol #2290033724A008).

Responding to Climate Change through Clinical and Translational Research

ASSOCIATION BETWEEN ADHERENCE TO DIETARY GUIDELINES AND CARDIOMETABOLIC RISK FACTORS IN YOUNG ADULTS IN PUERTO RICO

Cynthia M. Pérez, PhD[1]; Andrea López-Cepero, PhD[2]; Katherine L. Tucker, PhD[3]; Catarina Kiefe, PhD, MD[4]; Sharina Person, PhD[4]; Polaris Torres, MS[1]; Claudia Boneu, MPH[1]; Milagros C. Rosal, PhD[4].

[1]Graduate School of Public Health, University of Puerto Rico-Medical Sciences Campus, San Juan, PR;
[2]Rollins School of Public Health, Emory University, Atlanta, GA;
[3]Zuckerberg College of Health Sciences, University of Massachusetts Lowell, Lowell, MA;
[4]UMass Chan Medical School, Worcester, MA.

INTRODUCTION: Limited research in Puerto Rico indicates suboptimal diet quality among residents, which is concerning due to its potential cardioprotective effects. Data on diet quality and its correlation with cardiometabolic risk factors in young adults is lacking. Therefore, our study aimed to investigate the associations between diet quality and cardiometabolic risk factors in young adults.

METHODS: This cross-sectional analysis included 2,173 adults (18-29y, 61% women) who provided complete data on questionnaires, physical exams, and laboratory assays as part of the PR-OUTLOOK study. Diet quality scores, evaluated using the Dietary Approaches to Stop Hypertension (DASH) scale (range: 8-40), were converted to z-scores for standardization. Cardiometabolic risk factors included body mass index (BMI), waist circumference (WC), total cholesterol, high-density and low-density lipoprotein cholesterol (HDL-C, LDL-C), triglycerides, systolic and diastolic blood pressure (SBP, DBP), fasting glucose (FG), hemoglobin A1c (HbA1c), and high-sensitivity C reactive protein (hs-CRP). The relationship between DASH z-scores and each cardiometabolic risk factor was analyzed using robust linear regression, adjusting for age, sex, education, marital status, subjective social status, physical activity, and smoking.

RESULTS: The mean DASH score was 24.0±4.6. DASH scores showed a positive association with HDL-C (β =0.6, P=0.008) and negative associations with BMI (β = -0.4, P=0.006), WC β = -1.1, P<0.001), LDL-C (β = -1.4, P=.011), fasting glucose (β = -0.5, P=0.015), HbA1c (β = -0.02, P=0.003), and hs-CRP (β =-0.01, P=0.016).

CONCLUSION: Young adults had low adherence to the DASH dietary pattern, which was associated with cardiometabolic risk. These findings highlight the importance of adopting a healthy dietary pattern in early adulthood.

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IRB approval number: The study was approved by the UPR MSC IRB (protocol #2290033724A008).

THE PREVALENCE OF GESTATIONAL DIABETES MELLITUS IN HISPANIC WOMEN OF PUERTO RICO: A COMPREHENSIVE STUDY

Keyla Bordonada, MD[1]; Liana Cortes, MD[1]; Xayisnalie Martinez, MD[1]; Rodrigo Diaz, MD[1].
[1]Department of Obstetrics and Gynecology, San Juan City Hospital, San Juan Puerto Rico

INTRODUCTION: Gestational Diabetes Mellitus (GDM) stands out as one of the most prevalent complications during pregnancy, affecting 1% - 14% of pregnancies in the USA, increasing the risk of developing Type 2 Diabetes Mellitus (T2DM) within five years post-delivery, Latin American women, particularly showing a higher risk of 60%. The latest available data from Puerto Rico in 2001, reported a GDM prevalence of 2%, with notable complications during delivery including macrosomia (14%) and pre-eclampsia (6.4%). We aim to evaluate the prevalence of GDM in Puerto Rican women, emphasizing demographic characteristics, common risk factors, and maternal outcomes.

METHODS: Retrospective, cross-sectional study. Data will be collected from hospital medical records.

RESULTS: Study analyzes 222 women diagnosed with GDM; results showed that vaginal delivery rate has decreased from 2020 to 2022, 55% to 35.1% respectively. Average BMI was 34 in 2022, increasing C-section rate. 20.8% of the women with GDM present with preterm deliveries within 2022. But the prevalence has decreased over time: 2020 (6.6%), 2021 (4.8%) and 2022 (5.3%). Most common complication in 2022 during the pregnancy was Hypertension (20.8%) and Pre-eclampsia (9.1%).

CONCLUSION: The occurrence of GDM has increase over time, associated with short and long-term effects on the mother and the baby. Hispanic population faces an elevated risk due to ethnicity and incidence of overweight. Recognizing these factors, understanding pregnancy outcomes, and determining prevalence are crucial for implementing appropriate medical management and enhancing the overall quality of life.

IRB approval number: San Juan City IRB: 00002788

TYPE 1 DIABETES CASES IN CHILDREN AGED 0-14: INCIDENCE AND REGIONAL DISTRIBUTION IN PUERTO RICO

Natalia Vázquez, MS(c)[1]; Orville M. Disdier, Ed.D[1]; Mariana Benítez, MHSA[2]; Bernardo Maldonado, MSN[2].
[1]Instituto de Estadísticas de Puerto Rico;
[2]Fundación Pediátrica de Diabetes de Puerto Rico.

INTRODUCTION: Global burden of type 1 diabetes mellitus (T1DM) in children is rising, with varying incidence rates globally. Among the top ten countries with the highest T1DM incidence rates in children aged 0-14 years, Finland leads with 52.2, and Ireland is tenth with 27.5. This study aims to examine the incidence and distribution of T1DM in Puerto Rican children.

METHODS: This study is a collaboration between the Puerto Rico Institute of Statistics, and *Fundación Pediátrica de Diabetes de Puerto Rico*. Cases were identified with data from 2009-2022 in children aged 0-14. Incidence rates were calculated using annual population estimates from Puerto Rico's (PR) census data, stratified by year, age, sex, and municipality. Regional incidence was examined and mapped as per PR department of health regions.

RESULTS: In 2022, the incidence rates of T1DM was 39.3. From 2009-2022, the highest rates were observed in 2021 at 43.4. Males and females had a peak incidence of 45.9 and 40.8, respectively. Regionally, Metro had the highest incidence at 53.0, followed by Arecibo (50.1), Fajardo (48.6), Bayamón (43.7), Mayagüez (34.9), Caguas (32.5), and Ponce (21.1).

CONCLUSION: The incidence rate of T1DM in PR is comparable to rates observed in the top 10 ranked countries globally. With a rate of 39.3 in 2022, the incidence approaches the fourth position following Finland, Sweden and Kuwait. This underscores the importance of continued research and strategies for T1DM in PR youth, accounting for regional variances. This study's comparative approach between local and global data provides a broader public health perspective.

IRB approval number: This study does not require IRB review as it involves secondary analysis of publicly available data from the Puerto Rico Institute of Statistics on Type 1 Diabetes.

EARLY DETECTION OF ASTHMA: ASSESSING THE EFFECTIVENESS OF FORCED OSCILLATION TECHNIQUE IN PRESCHOOLERS

Lynoshka I. Caraballo Mercado, MS[1]; *Kiara J. Rodríguez Pérez, MS*[1]; *Marcos J. Ramos Benítez, PhD*[1]; *Wilfredo De Jesús Rojas, MD*[1,2].
[1]*Pediatrics, Ponce Health Sciences University, Ponce Research Institute, Ponce, Puerto Rico;*
[2]*Basic Sciences, Ponce Health Sciences University, Ponce Research Institute, Ponce, Puerto Rico*

INTRODUCTION: The significant prevalence of asthma among Puerto Rican children under five, who are unable to undergo spirometry—the gold standard—highlights the necessity for alternative diagnostic approaches. This study investigates the Forced Oscillation Technique (FOT) for evaluating airway impedance, hypothesizing that it can improve diagnostic accuracy in these pediatric patients.

METHODS: We conducted a retrospective analysis of data from 452 patients aged 3 to 5, with or without a preliminary diagnosis of asthma. FOT measurements were obtained using the Resmon Pro V3 device, calibrated at 8Hz. We queried resistance (Rrs) and reactance (Xrs) values before and after the administration of a bronchodilator (2.5 mg of nebulized albuterol) to evaluate their responses.

RESULTS: We showed significant differences in respiratory resistance pre- and post-bronchodilator intervention, with mean Rrs values decreasing from 9.96 to 8.20 ($p < 0.0001$). Concurrently, respiratory Xrs increased from -4.61 to -3.43 ($p < 0.0001$). In contrast, comparative analysis with a control cohort without a preliminary diagnosis of asthma had only statistically significant differences in Rrs (9.48 and 8.60, $p = 0.0043$) and not on Xrs (-4.39 to -3.79, $p = 0.0856$).

CONCLUSION: Significant reductions in Rrs and Xrs values after bronchodilator in the asthma group and the lack of similar changes in the non-asthma group highlights FOT's values as a non- invasive diagnostic and management tool for asthma, particularly useful in pediatric patients from highly affected areas where spirometry is challenging.

Funding: The study was supported by the Ponce Research Institute.

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WOMEN AT A HIGHER RISK OF CHILDREN WITH CYSTIC FIBROSIS AND SPINAL MUSCULAR ATROPHY IN PUERTO RICO

Paulette Urrutia, MD[1]; Liana Cortes, MD[1]; Xayisnalie Martinez, MD[1]; Olga Pereira, MD, FACOG[1].
[1]Department of Obstetric and Gynecology, San Juan City Hospital

INTRODUCTION: Genetic screening allows women to determine their carrier status for heritable diseases, such as Cystic fibrosis (CF) and Spinal Muscular Atrophy (SMA). Acknowledging carrier status and risk for transmission of such genetic diseases may help couples with decision-making processes during pregnancy. CF and SMA are two common genetic diseases among Hispanics. Data reveals carrier frequency for CF to be 1/46 in Hispanic-Americans and Survival Motor Neuron 1 (SMN1) mutations to occur between 1/25-50 individuals in the general population. Our aim is to identify carriers among Hispanics at a community hospital in order to provide adequate management and counseling.

METHODS: Retrospective, descriptive study was performed. Data obtained from medical records at a community hospital in San Juan, Puerto Rico. Inclusion criteria were current pregnancy at any gestational age and receiving prenatal care at our institution. Missing carrier screening was the only exclusion criteria.

RESULTS: A total of 555 records were reviewed from September 2021 to May 2023. Carrier frequencies were 0.018 for CF and 0.088 for SMA. Hispanic women composed 100% of the population.

CONCLUSIONS: CF carrier frequency on our sample is similar to data priorly reported for Hispanic populations (0.018 versus 0.020). SMA carrier frequency in our population is higher compared to published data (0.088 versus 0.020). Carrier screening for CF and SMA among pregnant patients is imperative for ensuring adequate counseling, providing appropriate management throughout the phases of prenatal care and optimizing the quality of life of the offspring.

IRB approval number: San Juan City Hospital IRB:00002788

ENHANCING PATIENT CARE THROUGH COMPREHENSIVE LUMBAR SPINE MRI EVALUATION: A STUDY ON INCIDENTAL FINDINGS

Maria Biaggi[1]; Andres Gorbea[2]; Dr. Jorge Vidal[3].
[1]Ponce Health Sciences University;
[2]Universidad Central del Caribe;
[3]University of Alabama at Birmingham

INTRODUCTION: Traditional lumbar spine MRI evaluations often overlook the critical connections between the lumbar spine and adjacent abdominal and pelvic structures. This study advocates for a holistic evaluation approach to improve clinical care by understanding the comprehensive anatomy of patients through lumbar spine MRI studies. It aims to highlight the importance of detecting incidental findings within the abdomen and pelvis that may impact patient management.

METHODS: A retrospective analysis of 200 lumbar spine MRI studies was performed, focusing on incidental findings in both primary study sequences and planning images. Patients included in the study presented with various medical concerns, offering a realistic clinical perspective. The study aimed to identify and differentiate incidental findings ranging from clinically insignificant to critical, including renal cysts, ovarian cysts, uterine myomas, aortic aneurysms, renal calculi, avascular necrosis, colonic diverticula, and pelvic tumors.

RESULTS: The study unveiled a broad spectrum of incidental findings, from common, non-critical conditions like renal and ovarian cysts to significant ones such as aortic aneurysms and pelvic tumors. The findings emphasize the necessity of a thorough evaluation in lumbar spine MRI interpretations, demonstrating the educational impact on healthcare professionals in recognizing and addressing these incidental findings effectively.

CONCLUSION: This presentation underscores the importance of a vigilant, comprehensive evaluation approach in lumbar spine MRI studies, promoting early detection of incidental findings. By enhancing awareness among practitioners, the study advocates for improved patient outcomes through timely intervention and monitoring of relevant conditions, thereby elevating the standard of patient care.

LONGITUDINAL ANALYSIS OF NEUTROPHIL-TO-LYMPHOCYTE RATIO AND DISEASE PROGRESSION IN ALS: A CASE STUDY

Kevin De Jesús-Morales, MD[1]; Wilfredo De Jesús-Rojas, MD[2]; Marcos J. Ramos-Benítez, PhD[2].
[1]Department of Physical Medicine, Rehabilitation, and Sports Medicine, University of Puerto Rico – Medical Sciences Campus, San Juan, PR. 00927;
[2]Department of Basic Sciences, Ponce Health Science University and Ponce Research Institute, Ponce, PR. 00730

INTRODUCTION: The Neutrophil-to-Lymphocyte Ratio (NLR) has emerged as a biomarker of severity and progression in Amyotrophic Lateral Sclerosis (ALS). However, detailed longitudinal studies that track NLR from pre-diagnosis through disease progression are scarce. We present a case study that provides a 13-year longitudinal evaluation, identifying temporal relationships between NLR and relevant clinical events.

METHODS: We conducted a retrospective analysis of a 56-year-old Puerto Rican male diagnosed with ALS. We tracked the patient's NLR, utilizing data available from 2011 (six years pre-diagnosis) until 2024 (seven years post-diagnosis). We correlated that data with pulmonary function tests and disease progression.

RESULTS: Our findings demonstrate a significant upward trend in NLR as the disease progresses (R^2=0.47, P=0.001). Through longitudinal analysis, we identified a notable increase in NLR values (>4) at the onset of symptoms. Furthermore, post-diagnosis, NLR showed a negative correlation with FEV1% (R^2=0.95, P=0.02) and FVC% (R^2=0.96, P=0.01). From 1.5 to 7 years after diagnosis, NLR levels have consistently remained above the normal range, experiencing fluctuations between 2.4 and 5.4.

CONCLUSION: In conclusion, although other studies have shown the association of NLR with disease progression and risk, our case study on NLR in ALS provides unique insights by tracking NLR changes from years pre-diagnosis through disease progression. This extended timeline offers valuable perspectives, showing how NLR fluctuates in relation to clinical events in ALS while negatively correlating with indicators of disease progression.

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IRB approval number: 2401181866 – Ponce Research Institute

EVALUATING DENGUE NS1 IMMUNE COMPLEX FORMATION AND THEIR ASSOCIATION WITH SERUM NEUTRALIZATION CAPACITY

Dorca E. Marcano Jiménez[1]; Paola N. Flores Pérez[1]; Rachel M. Rodríguez[1]; William Messer[2]; Vanessa Rivera-Amill[1]; Marcos J. Ramos Benítez[1].
[1]Ponce Health & Sciences University/Ponce Research Institute, Ponce, PR;
[2]Oregon Health & Science University, Portland, OR

INTRODUCTION: Dengue virus (DENV), a major global cause of arboviral diseases, exhibits increased severity in secondary infections partially due to enhanced immune activation mediated by non-neutralizing antibodies, a process known as antibody-dependent enhancement (ADE). This study assesses the formation of IgG and IgA immune complexes in seropositive individuals and examines the correlation with their serum neutralizing capacity. Our aim is to develop a tool for measuring non-neutralizing immune complex levels to eventually characterize their role in triggering pro-inflammatory responses associated with DENV infections.

METHODS: Using serum from 16 seropositive individuals from Puerto Rico, we developed an ELISA assay to measure IgG-NS1 and IgA-NS1 immune complex formation against all four DENV serotypes. The neutralization capacity was assessed via the FRNT50 assay, and linear regression was used to analyze the relationship between immune complex formation and neutralization.

RESULTS: Significant differences in IgG-NS1 and IgA-NS1 immune complex formation were observed across DENV serotypes. We showed elevated IgG-NS1 levels in DENV1, DENV3, and DENV4, compared to DENV2 ($P<0.05$). Higher IgA-NS1 levels were shown in DENV3 compared to DENV2 and DENV4 ($P<0.05$), with a trend towards higher levels than DENV1. A significant correlation between IgG-NS1 levels and neutralization capacity was identified exclusively in DENV1.

CONCLUSION: Our findings reveal notable variability in IgG and IgA immune complex formation across DENV serotypes. These results highlight the complex role of immune complexes in DENV disease and suggest that studying them could provide valuable insights into disease progression and help improve management and therapeutic strategies for secondary infections.

HLA DIVERSITY IN DENGUE IMMUNITY: INSIGHTS FROM A PUERTO RICAN COHORT

Paola N. Flores-Pérez, BS; Rafael Sanchez, BS;
Andrea Arias García, MS; Vanessa Rivera-Amill, PhD.
Ponce Health Sciences University, Ponce, PR.

INTRODUCTION: Dengue virus (DENV) is the most common mosquito-borne viral disease globally, causing an estimated 40,000 deaths yearly. There's no specific treatment, and the only US-FDA-approved vaccine for dengue, CYD-TDV(Dengvaxia®), has limited approval. Host genetic factors, like Human Leukocyte Antigen (HLA) genes, play a crucial role in the immune system response by encoding proteins that present antigens to T cells and influence disease susceptibility. Studies highlight robust T-cell responses linked to specific HLA alleles in DENV infection. However, research must identify DENV-specific HLA-restricted T-cell responses across diverse populations, including Puerto Rico.

METHODS: We aim to characterize the magnitude of the T-cell response when HLA-restricted with DENV-specific peptides in a Puerto Rican cohort. We first performed HLA genotyping by NGS using buccal samples from seropositive DENV participants and the MHC Core Library & Capture Kit from BioDynami. We then analyzed the sequences using NextGENe Software.

RESULTS: Preliminarily, we observed that the allelic variants that are found at a frequency greater than 5% in Puerto Rico are DPB1:01:01, DPB1:02:01, DPB1:04:0, DQB1:05:01, DQB1:06:01, DQB1:06:02, DQB1:06:04, DRB1:01:01, DRB1:15:01, and DRB1*16:02. Following the complete description of the HLA alleles from our Puerto Rico cohort, we will perform HLA peptide binding predictions using the Immune Epitope Database prediction tool and then be able to complete the functional assays.

CONCLUSION: Understanding these population-specific patterns and examining the intricacies of HLA and T-cell mediated responses deepens our understanding of the genetic factors involved in immune responses and gives insights into innovative disease prevention and treatment approaches.

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CHARACTERIZATION OF PERIPHERAL MICROBIAL PRODUCTS ASSOCIATED WITH HIV INFECTION AND CANCER RISK IN PR

Jurelis Torres-Reyes, MS[1]; Tanner L. Shull, MS[4,5]; Gabriel Borges-Vélez, PhD[1]; Verónica S. Sánchez-González[1,2]; Jeannette L. Salgado-Montilla, MT MS[1] and Josué Pérez-Santiago, PhD[1,2].
[1]University of Puerto Rico Comprehensive Cancer Center; [2]Department of Natural Sciences, University of Puerto Rico- Rio Piedras; [3]University of Puerto Rico Medical Sciences Campus, School of Dental Medicine; [4]Medical Center, Department of Microbial Pathogens and Immunity, Chicago, IL, USA; [5]University of Illinois at Chicago, School of Public Health, Chicago, IL, USA; Rush University.

INTRODUCTION: People with HIV (PWH) experience persistent inflammation and have an elevated risk of cancer, even with successful antiretroviral therapy. Microbial dysbiosis can promote subsequent inflammation by upregulating TGF-β and the translocation of microbial products into the bloodstream, thus increasing cancer risk. This study aimed to quantify levels of TGF-β and microbial products (lipopolysaccharide [LPS], and short-chain fatty acids [SCFA]) in blood plasma of PWH and without HIV (PWOH) to determine the relationship of all these factors in Puerto Ricans PWH.

METHODS: Blood samples, sociodemographic, and clinical data from 80 adults (50 PWH and 30 PWOH) were collected. PWH were virally suppressed with a median CD4 count of 699.8 cells/μL. We measured TGF-β, LPS, and soluble CD14 (sCD14) using immunoassays. SCFA (acetate, butyrate, and propionate) were measured using GC-MS. Differences in the median levels of all variables were evaluated using Mann-Whitney test. Association of inflammation with peripheral microbial products was assessed by univariate and multivariate fixed-effects regression analyses. Statistical analyses were performed in R-statistical software.

RESULTS: PWH had significantly higher levels of TGF-β ($p=0.017$), higher levels of LPS ($p<0.001$), higher levels of sCD14 ($p=0.007$), and significantly lower levels of butyrate ($p<0.001$). Higher levels of TGF-β were associated with higher levels of LPS ($rho=0.38$, $p=0.017$) and higher levels of sCD14 ($rho=0.27$, $p=0.016$) these relationships remain significant after adjusting for HIV status ($p<0.001$).

CONCLUSION: Our findings suggest that LPS in blood plasma may contribute to cancer risk in Puerto Rican PWH and may represent potential novel biomarkers for cancer prevention.

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PROTEOMICS PROFILE IN SALIVA ASSOCIATED TO ORAL HPV18+ AS POTENTIAL BIOMARKERS FOR OSCC RISK IN PUERTO RICANS WITH HIV

Gabriel San Miguel-Matos[1,2]; Gabriel Borges-Vélez, PhD[1]; Jeannette L. Salgado-Montilla[1]; and Josué Pérez-Santiago, PhD[1,3].
[1]University of Puerto Rico Comprehensive Cancer Center (UPRCCC), San Juan, PR;
[2]University of Puerto Rico Río Piedras Campus (UPRRP), San Juan, PR;
[3]University of Puerto Rico Medical Sciences Campus (UPRMSC), School of Dental Medicine, San Juan, PR.

INTRODUCTION: Oral HPV has been linked to approximately 71.7% of all oropharyngeal squamous cell carcinoma (OSCC). The prevalence of oral HPV among people with HIV (PWH) is high, particularly in Puerto Rico, thus making Puerto Ricans disproportionately vulnerable to OSCC. Therefore, it is crucial to determine factors that can explain disparities in OSCC development. Here, we characterized the proteomic profile of Puerto Rican PWH with and without oral HPV 18 infection (HPV18+) to further understand biological mechanisms altered in the oral microenvironment that could increase OSCC risk.

METHODS: Saliva samples collected from ten Puerto Rican PWH with and without oral HPV infection were selected for protein extraction via the Minute™ Native Protein Precipitation Kit. Concentrations were measured using Pierce™ 660nm Protein Assay and Tandem Mass Tagging 11-plex was performed by the RCMI proteomics core. Statistical differences between groups were evaluated using Proteome Discover.

RESULTS: HPV18+ showed significant decrease of desmoplakin (DSP, p=0.01), methionine sulfoxide reductase A (MSRA, p=0.03), leukocyte elastase inhibitor (LEI, p= 0.05), heat shock protein 90 (HSP90AA1, p=0.05), glutathione S-transferase pi 1 (GSTP1, p=0.05), and glutamate dehydrogenase 1 (GLUD1, p=0.05). Decreased abundance of DSP, GSTP1, MSRA has been associated with loss of tissue integrity, perturbed ROS homeostasis, altered protein repair and inefficient protein folding, respectively. Additionally, decreased GLUD1 and SERPINB1 have been identified as biomarkers for other cancers.

CONCLUSION: We identified a specific proteomic profile in saliva associated with oral HPV18+ in Puerto Rican PWH that may represent potential biomarkers for OSCC prevention in Puerto Rican PWH.

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IRB approval number: 2021-05-50

POLYMORPHISMS OF TLR 4 AND 9 AS BIOMARKERS FOR CERVICAL DYSPLASIA AND HPV INFECTION IN A GROUP OF PUERTO RICAN WOMEN

Keimari Mendez, MD[1]; Ana Rosario, MD[1];
Magaly Martinez, PhD[2]; Alejandro Rivera, BS[2];
Josefina Romaguera, MD[1]; Filipa Godoy, PhD[1].
[1]University of Puerto Rico-School of Medicine;
[2]University of Puerto Rico-Comprehensive Cancer Center

INTRODUCTION: Cervical cancer, a leading cause of mortality globally, is caused by Human Papillomavirus (HPV) in over 90% of cases. Puerto Rican women have higher incidence than other populations. Epigenetics and immune related host factors may explain this health disparity. Toll like receptors (TLRs) are involved in the immune response of cancer and inflammation. Single nucleotide polymorphisms(SNPs) of TLR4 and TLR9 have been related to HPV infection and cervical cancer. We aimed to correlate the presence of 8 SNPs with cervical dysplasia and HPV infection. Our hypothesis is that increased susceptibility to HPV infection and cervical dysplasia is due to these polymorphisms.

METHODS: We obtained 210 cervicovaginal samples from *protocol #10510114* for our study. Information about cervical dysplasia, HPV genotype and sociodemographic data was available. We measured expression of 8 SNPs using PCR, then determined allele's frequency and analyzed its correlation with degree of cervical dysplasia and HPV positivity.

RESULTS: Women who expressed a NCOI of AA had 3.11 times higher odds of having dysplasia compared to women who expressed a NCOI of AG(p=0.03). Women exhibiting a CG Earl profile had 2.21 higher odds of being HPV-positive compared to women with a GG Earl. (p=0.03).

CONCLUSION: We found 2 SNPs of TLR 4 to be significantly associated with severe dysplasia (NCOI) and hr HPV infection(EARI). 35.71% of severe dysplasia patients had lr-HPV infection, raising concern for different epidemiology in PR. Future studies with other SNP's and better representation of dysplasia and cancer cases will be done to explore its use as potential biomarkers.

IRB approval number: IRBB3550122/IBC #145222

ACCESS TO HIV PREVENTION AND TREATMENT SERVICES IN PUERTO RICO DURING THE COVID-19 PANDEMIC: A MIXED-METHODS STUDY

Edda I. Santiago Rodríguez, DRPH, MPH, MA[1]; Mario Rodríguez Cancel, PHD[1]; Glorian Carrasquillo Sanchez, MPH[1]; Yarieliz Rodríguez Feliciano, MHSN[1]; Ilia Otero Cruz, MPH[1]; Luis A. Arroyo-Andujar, MPH, MA[1]; Milton Rodríguez Padilla, MPHE[1]; Souhail Malave Rivera, PHD, MSC[1]; Carlos Rodríguez Díaz, PHD, MPHE[2].
[1]University of Puerto Rico, Medical Sciences Campus, School of Public Health;
[2]Boston University, School of Public Health

INTRODUCTION: COVID-19 overwhelmed healthcare infrastructure, leading to disruptions in routine HIV care and services in some places. We aimed to explore the impact of the COVID-19 pandemic on HIV prevention and care services for Latinx sexual and gender minorities in Puerto Rico.

METHODS: We are conducting a convergent mixed-methods study. We used semi-structured interviews with healthcare providers (HCP), sexual minority men (SMM) and transgender women (TW) to describe their experience offering and receiving services respectively. Interview guide included questions about access, satisfaction with services, telemedicine, among other areas. We used an online survey to capture the experience of accessing treatment and services from sexual and gender minorities in PR. A thematic analysis was completed for the qualitative data. Descriptive statistics were completed for que quantitative data.

RESULTS: A total of 15 HCP, 15 SMM and 7 TW completed the semi-structured interview. SMM expressed no problems accessing HIV prevention or treatment services during COVID-19. Most expressed that the changes clinics enforced during the COVID-19 pandemic benefited treatment adherence. Sixty-one participants completed the survey, most being SMM (n=49) with a mean age of 46 yrs [24 – 72]. About n=28 were HIV positive. Results show that 83.3% of participants didn't have challenges accessing prevention services. More than half (60.4%) requested condoms, 58.3% got HIV tested, 41.7% asked for PrEP and 20.8% went for counseling. Around 72.4% of HIV positive participants didn't interrupt their antiretroviral care.

CONCLUSION: Preliminary findings show that HIV prevention and treatment services were not greatly disrupted through the COVID-19 pandemic in Puerto Rico.

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COVID-19 MATERNAL INFECTION AND ITS ASSOCIATION TO CHILDBIRTH AND DEVELOPMENTAL OUTCOMES

Polaris González-Barrios, PhD, MSc[1]; Keimarisse Diaz-Colon, PhD[2]; Cynthia García-Coll, PhD[2]; Eliannette Martínez-Vera[3]; Brittany M. Nieves-Ayala, MS[4]; Juanita Negrón-Pagán MD[2]; Leticia Gely-Rojas MD[2]; Inés Garcia García, MD[2]; Lourdes Garcia-Fragoso, MD[2].
[1]Deparment of Psychiatry, University of Puerto Rico, Medical Sciences Campus;
[2]Department of Pediatrics, Neonatology section, University of Puerto Rico, Medical Sciences Campus;
[3]University of Puerto Rico, Rio Piedras;
[4]Ponce Health Sciences University.

INTRODUCTION: COVID-19 infection may bring alterations to maternal-childbirth and developmental outcomes that are yet to be discovered. This study aims to explore if there are possible associations between maternal-infection type, and timeframe of infection, with childbirth and developmental outcomes.

METHODS: N=44 mother-child dyads recruited to assess maternal prenatal COVID-19 infection, childbirth outcomes, and child development (milestones, cognitive, motor, language, behavioral, autism risk) at 6-24-months. Sample was categorized between COVID-19 maternal infection [symptomatic (S) vs. asymptomatic (A)]. Descriptive statistics assessed frequencies of behavioral variables, birth outcomes, and mean comparisons assessed group tendencies among assessments. SPSS v.29 was used for analysis, CI 95%, $p<.05$.

RESULTS: 16 mothers contracted symptomatic COVID-19 during pregnancy, 26 were asymptomatic and 2 unknowns. Birth outcomes indicate that prematurity rate was higher in A-group ($n=26$, $F(40,6)=9.81$, $p=.003$); as well as intensive care admissions ($n=22$, $p<.05$). 99% of the mothers in A-group were infected in third trimester while S-group varied across trimesters. Interestingly, developmental mean comparisons (cognitive, motor, language and behavioral) varied across groups but only significant differences were seen with: Positive behavior (Mean 5. 30 vs. 4.13) and Sociability scores (6.07 vs. 4.66) higher for S- group ($p<.05$) and autism risk higher for A-group ($F(35, 9) = 15.3$, $p<.001$).

CONCLUSIONS: Results reveal interesting tendencies in which COVID-19 asymptomatic maternal infection group presented worse childbirth outcomes, worsened social and positive behaviors among children, and increased autism risk. This could be associated with third-trimester infection. Results warrant further analysis and increased sample size to better understand results.

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MAMMARY AND AXILLARY LYMPHADENOPATHY POST COVID-19 VACCINATION IN THE PUERTO RICAN POPULATION

Maillim I. Ortiz López, MS-III; Andrés I. Gorbea Dolagaray, MS-III;
Sergio M. Aymat Sánchez-Vahamonde, MS-III; Gabriel O. Camareno Soto, MS-III;
Elyette M. Lugo Quiñones, MS-III; Daniel E. Del Toro Pedrosa, MS-III; Nora E. Núñez Peña, MS-III;
Luis J. Méndez Rosa, MS-III; María D. Díaz Rosario, MS-III; Adrián G. Girald Rodríguez, MS-III;
Bárbara L. Riestra Candelaria, PhD.
Universidad Central del Caribe, Bayamón, Puerto Rico

INTRODUCTION: The COVID-19 pandemic halted world economics and became the leading cause of death in many countries. The vaccines developed have been associated with a wide array of symptoms, such as axillary and mammary lymphadenopathy (LAD). Currently, there is limited data available on LAD after COVID-19 vaccination in the Puerto Rican population. This study aims to evaluate the presence and characteristics of LAD findings after each dose of the vaccine among this population.

METHODS: This study engaged over 160 participants through a questionnaire consisting of 36 questions. The survey assessed possible mammary/axillary lymphadenopathy effects the participants may have experienced after each dose of the COVID-19 vaccine. The investigation sought to identify LAD symptoms post-vaccination, comparing intensity across age and gender, and exploring the relationship between pre-existing conditions and symptom exacerbation.

RESULTS: The data collected shows a trend regarding the presence of mammary/axillary lymphadenopathy after COVID-19 vaccination in the Puerto Rican population. 24% reported some degree of pain after receiving the first dose, while 10.7% reported inflammation in the ipsilateral axillary injection site. Furthermore, 67% of LAD cases lasted between three and seven days after vaccination, while only 8% lasted for more than four weeks.

CONCLUSION: This research highlights the commonality and benign nature of LAD following COVID-19 vaccination in the Puerto Rican population. It underscores the necessity for healthcare providers to be aware of vaccination-related LAD so they may educate patients about possible symptoms post-vaccination. Finally, this will allow them to manage patient concerns effectively and avoid unnecessary diagnostic procedures.

IRB approval number: 2023-04 Universidad Central del Caribe

NEUROINFLAMMATION CORRELATES WITH COMBINED OBESOGENIC ENVIRONMENT AND STRESS HORMONES

Ricardo Vazquez[1]; Yalimar P. Rivera[2]; Fabiola Rodriguez[1]; Gabriela Ortiz[1]; Yaritza Inostroza-Nieves[1].
[1]San Juan Bautista School of Medicine, Caguas, PR;
[2]University of Puerto Rico, Humacao Campus, Humacao, PR

INTRODUCTION: Childhood obesity is a significant health challenge that broadly impacts metabolic and mental health. Some individuals are more susceptible to obesity when exposed to psychosocial stress during adolescence. Neuroinflammation is thought to mediate this association; however, the mechanisms underlying this vulnerability remain unclear. We sought to determine the adverse synergy of an obesogenic environment and stress hormones on neuroimmune function.

METHODS: Human microglia cells (HMC3) were treated with palmitate and hydrocortisone for 24 hours to study their effects on cytokine, ROS production, and inflammation pathways activation. IL-6 and TNF-α levels were measured using ELISA. ROS production was measured using the MUSE Oxidative Stress kit.

RESULTS: Human microglia showed various morphological properties change in response to hydrocortisone and palmitate. Il-6 and TNF-α were overproduced in response to palmitate and hydrocortisone. In addition, the combination of palmitate and hydrocortisone synergistically increases the ROS production in HMC3 cells. NF-κB activation was significantly influenced by palmitate and hydrocortisone.

CONCLUSIONS: Long-term consumption of an obesogenic diet during adolescence negatively affects microglia function and increases inflammation by microglia cells. Elevated inflammation and affected microglia may contribute to the amplified stress reactivity and obesity-related behaviors seen in those who have experienced childhood trauma. These results deepen our understanding of potential mechanisms linking early exposure to trauma and obesity.

PENICILLIN ALLERGY DE-LABELING IN PUERTO RICO: PERCEPTIONS AND PRACTICES AMONG PHYSICIANS

Gabriel Gonzalez-Diaz, MS[1]; Joshua Vivas, MS[1]; Gerardo E. Rodríguez-Matias, BS[1]; Emil Varas-Rodríguez, MPH[1]; Francis Cedeño, BS[2]; Oscar Duyos, MD, FAAOS[3].
[1]Ponce Health Sciences University, School of Medicine, Ponce, PR, 00716;
[2]University of Puerto Rico, School of Medicine, San Juan, PR, 00921;
[3]Menonita Medical Center, Cayey, PR, 00736

INTRODUCTION: Over 80% of self-reported penicillin allergies are inaccurately labeled, leading to increased medical costs, post-surgical complications, and reliance on second-tier antibiotics. Recent evidence has increasingly supported the safety and benefits of de-labeling; however, the extent of its implementation within Puerto Rico's healthcare context remains unexplored. This study aims to examine current practices, perceived limitations, and attitudes related to penicillin allergy de-labeling among physicians in Puerto Rico.

METHODS: We conducted a survey including physicians in Puerto Rico. The survey gauged frequency of de-labeling practices, testing methods, perceived limitations, and attitudes towards de-labeling.

RESULTS: 152 physicians completed the survey. The preliminary data demonstrates a reluctance to de-label, with a majority avoiding penicillin prescriptions even without confirmation of allergy. Only 47% of respondents had encountered de-labeling opportunities, and fewer had attempted it, primarily using oral challenge tests. Concerns over adverse reactions, availability of alternatives, and logistical challenges were predominant limitations. Despite this, the attitude towards de-labeling was overwhelmingly positive, highlighting its perceived safety, potential for cost savings, and resistance reduction.

CONCLUSION: There is a clear discrepancy between the positive perceptions of penicillin allergy de-labeling and its clinical practice implementation in Puerto Rico. Addressing the identified limitations, particularly through educational interventions and improved clinical protocols, may enhance de-labeling practices. Such efforts could lead to optimized antibiotic use, improved patient outcomes, and reduced healthcare costs. Further investigation with a larger sample is warranted to confirm these initial observations and to fully understand the scope and impact of de-labeling practices on the island.

Funding: N/A

IRB approval number: This study was conducted in accordance with guidelines and protocols approved by the Institutional Review Board at Ponce Health Sciences University (Protocol #2307157290).

SEX DIFFERENCES IN BDNF EXPRESSION IN THE EXTINCTION OF MORPHINE PLACE PREFERENCE

Richiez-Mateo Wilma V.[1]; Lloret-Torres Mario[2]; Bonilla-Rullán Pedro[3]; Arraiza-Truust Helena[4]; Rosado-Rodríguez Fabiana[4]; Schrils Soto, Ricardo A.[4]; Torres-Rodríguez, Cristal M.[2]; Barreto-Estrada, Jennifer L[2]

[1]Department of Biology, University of Puerto Rico-Bayamón Campus, 00959-1919; [2]Department of Anatomy and Neurobiology, University of Puerto Rico-Medical Sciences Campus, 00936, [3]Departament of Social Sciences, School of Public Health, University of Puerto Rico, Medical Sciences Campus, 00936, [4]Department of Biology, University of Puerto Rico-Río Piedras Campus, Rio Piedras, 00925-253.

INTRODUCTION: CDC data shows that 74.8% of drug-related deaths are caused by opioids (2022). Addiction is a disorder of chronic drug-seeking caused by aberrant learning patterns, resulting in neuroplasticity changes in the corticomesolimbic reward system. Therefore, we study the biological basis of extinction of morphine seeking in female rats, through the expression of the pro-extinction molecule, brain-derived neurotrophic factor (BDNF) and its receptor, tropomyosin receptor kinase (TrK-B). Results will be compared to previous data in males.

METHODS: Animals were conditioned to morphine (5mg/kg) by using the conditioned place preference (CPP) paradigm, followed by extinction training, according to the estrous cycle. Withdrawal symptoms like rearings, grooming and side-transitions were assessed. Western blots were performed to evaluate BDNF and Trk-B expression in the reward system, i.e., the nucleus accumbens (VS/Nac), amygdala (AMY), and hippocampus (HPC).

RESULTS: Three behavioral phenotypes were identified: extinction, extinction-resistant, and sham-extinction. 45% of extinction trained females vs. 64% of males extinguished morphine CPP, whereas 55% of females vs. 36% of males were extinction-resistant. Sham-extinction females extinguished 40% of the time, compared to 20% of males. HPC-BDNF was upregulated in extinction males and females. AMY-BDNF increased only in males after extinction training. VS/Nac-BDNF showed no difference in males, while extinction females showed a significant upregulation. Non-phosphorylated Additionally, VS/Nac-Trk-B increased in extinction-resistant females. Preliminarily, animals in diestrus and estrous (low sex hormones) extinguished morphine preference.

CONCLUSION: In females, increased HPC and VS/NAc BDNF expression enables morphine extinction, whereas in males HPC mediates extinction and AMY mediates withdrawal symptoms.

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THE EFFECTS OF ADOLESCENT OR ADULT ACUTE STRESS ON COCAINE SEEKING IN MALE RATS

Marian Sepúlveda-Orengo; Joshua A. Pérez-Torres, Yobet Pérez-Pérez; Roberto Morales-Silva; Genesis Rodríguez-Torres.
Department of Basic Sciences, Ponce Health Sciences University-School of Medicine/ Ponce Research Institute, Ponce, Puerto Rico 00732, USA

INTRODUCTION: Adolescent or adult traumatic stress, such as violence and physical assault, has emerged as a substantial risk factor for substance use disorder (SUD). Preclinical studies suggest that stressful experiences during adolescence have long-term behavioral outputs and neurophysiological consequences, and altered efficacy of synaptic transmission in adulthood. To identify groups at risk of developing SUD, researchers must first elucidate the neurobiological mechanisms behind the stress/drug-addiction comorbidity. We hypothesized that stressful experiences, either during adolescence, adulthood, or both, will lead to higher cocaine-seeking behavior.

METHODS: To test this, we used the fear-conditioning (FC) paradigm as a stressful experience in both, adolescent or adult Sprague Dawley rats. In adolescent rats, 30 days after stress induction, rats were exposed to 12 days of short-access cocaine self-administration, followed by 15 days of extinction, and two reinstatement sessions (cue- and cocaine-primed). In adult rats the exact same protocol was used, except it was started five days after FC.

RESULTS: Contrary to our hypothesis, the stressed adolescent group showed no differences in cocaine consumption, extinction, and cue-primed reinstatement, relative to the controls. Moreover, cocaine-primed reinstatement significantly decreased compared to the non-stressed adolescent group. On the other hand, stressed adult male rats showed seemingly higher cocaine acquisition, no difference in extinction, and statistically significant difference in both, cue- and cocaine-primed reinstatements, compared to non-stressed adult rats.

CONCLUSION: Our findings show that the effects of acute stress on cocaine seeking behavior are dependent on the timing of the stressful event, with stressed adults showing higher reinstatement than adolescent.

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POLYSACCHARIDE PEPTIDE INDUCES AN INTERFERON-DRIVEN RESPONSE WITH NO CYTOTOXICTY IN JURKAT T-CELLS.

Alondra Bermejo Sanfeliz, [B.S. Student][3]; Glamaris Rosario Sanfiorenzo, [B.S. Student][3];
Angelisa Franceschini, [M.D.][2]; Nawal M. Boukli, [Ph.D.][1];
and Eduardo Alvarez Rivera, [Ph.D]1.
[1]Department of Microbiology and Immunology;
[2]Department of Pathology, Universidad Central del Caribe, School of Medicine, Bayamón, Puerto Rico;
[3]Department of Biology, Universidad de Puerto Rico, Bayamón, Puerto Rico.

INTRODUCTION: HIV-1 continues to be a significant threat on the adaptive immunity proven to be detrimental in CD4+ T-cells. Our recent findings demonstrated that Polysaccharide peptide (PSP) extracted from the mushroom *Coriolus versicolor* induces potent anti-HIV-1 effects. Specifically, PSP significantly impacts viral entry through the pre-production of Protein Kinase-R (PKR) under Toll-like Receptor 4 (TLR4). The current study sought to determine the anti-HIV roles of PSP in the adaptive immunity. The latest pre-liminary data has revealed the up-regulation of: TLR4, Nuclear Factor Kappa B (NF-kB), and the interferon (IFN) PKR with no PSP-induced cytotoxicity. These new datasets led to the hypothesis that PSP activates the transcription of IFNs under TLR4 signaling in T-cells. The outcome of this research will give insight towards the PSP antiviral effects in the adaptive immunity.

METHODS: PSP anti-HIV role was evaluated using Jurkat T-cells treated with 50µg-1,000µg for a total of 6 days. Viral load gathered from collaborators at Laboratorio Borinquen were performed to assess total HIV-1 with/ without PSP using PKR inhibitors. Immunoblots were performed for: PKR, TLR4 and NF-κB in Jurkat T-cells. MTT-viability were implemented to understand PSP cytotoxicity in Jurkats.

RESULTS: Viral load revealed an average of 73% and 11% (PKR blocker) PSP-induced restriction in innate immunity. Immunoblotting resulted in the overexpression of PKR, TLR4 and NFκB in PSP-treated Jurkat T-cells. MTT reported no PSP-cytotoxicity during a 6-days treatment.

CONCLUSION: The data gathered in this research demonstrates the first findings of PSP's immune boosting capabilities in the adaptive immunity.

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REDUCTION OF EZRIN LEVELS IMPAIRS MACROPHAGE SURVIVAL IN CYSTIC FIBROSIS LUNGS

Jocelyn Sánchez Santiago, BS[1,2]; Ravindra Gudneppanavar, PhD[2]; Emanuela Bruscia, PhD[2]; Thomas S. Murray, MD, PhD[2].
[1]San Juan Bautista School of Medicine;
[2]Yale School of Medicine

INTRODUCTION: Cystic Fibrosis (CF) develops due to a gene mutation of the Cystic Fibrosis Transmembrane Regulator (CFTR) and is characterized by a multisystemic hyperinflammatory state. Ezrin, a filamentous actin binding protein, is the link between CFTR and PI3K/AKT pathways. CF monocytes and macrophages (MΦ) induced with lipopolysaccharide (LPS) express low levels and altered cellular distribution of ezrin, affecting the immune response to bacteria. We researched if the absence of Ezrin levels enhances monocytes/MΦ cell death in response to acute lipopolysaccharide (LPS) inflammation.

METHODS: An acute inflammation model was recreated in WT and EZ-KO mice nebulizing with 12.5 mg *Pseudomonas aeruginosa* (PA) LPS and lung tissue obtained after 24hr for macrophage population analysis. Paraffin-embedded lung tissue sections were stained with CD68 (an MΦ marker), TUNEL (cell death marker) and DAPI (nuclei) and further images using a Leica Thunder Fluorescence microscope. Quantification of CD68 positive cells was done by counting cells and a Student's t-test was used to measure statistical significance between two groups.

RESULT: We found that there is a significance difference between the numbers of cells in Ez-KO mice in contrast to WT mice.

CONCLUSION: Ez-KO mice have reduced numbers of lung IMs in response to LPS. Ez-KO and CF-KO mice lung tissues have decreased number of MΦ post 24h of 1xLPS and 3x LPS stimulation, respectively compared to WT mice.

Funding: Funding was provided by the Yale School of Medicine Summer Research Program.

NEUTROPHIL EXTRACELLULAR TRAP FORMATION IN PRIMARY CILIARY DYSKINESIA: INSIGHTS FROM PMA-INDUCED NETOSIS

Karla J. Rosario-Pacheco BS[1], Sonya J. Malavez-Cajigas MS[1], Mercedes Lacourt-Ventura MS[1], Jose Muñiz BS[1], Wilfredo de Jesús-Rojas MD[1]; Marcos J. Ramos-Benitez PhD[1].
[1]Basic Sciences, Ponce Health Sciences University, Ponce Research Institute, Ponce, Puerto Rico

INTRODUCTION: Primary Ciliary Dyskinesia (PCD) exhibits impaired mucociliary clearance and recurrent infections, leading to neutrophil infiltration and Neutrophil Extracellular Trap (NETs) formation in the airways. NETs display a contradictive role, capable of pathogenic protection and tissue damage. Previous studies suggest reduced NETs formation in neutrophils from patients with PCD. This study aims to examine NETosis in these patients in response to Phorbol 12-myristate 13-acetate (PMA), a common NETosis stimulant.

METHODS: Neutrophils from five patients with PCD and matched controls were isolated and stimulated with PMA (25 – 100nM) to induce NETosis, recorded and quantified via live cell imaging. Plasma nitrate levels were measured as a surrogate for nitric oxide (NO) production capacity in PCD patients.

RESULTS: No significant differences were observed in NETosis capacity between PCD patients and healthy controls at 25nM and 50nM PMA. However, at 100nM PMA, NETs were significantly reduced in PCD patients ($P<0.05$). Plasma nitrate analysis suggested a possible correlation between NO production and NETosis capacity in response to PMA ($R^2= 0.72$, $P=0.07$).

CONCLUSION: NETosis discrepancies in response to PMA may be attributed to variations in NO synthesis capacity. PMA, which induces NO in neutrophils and enhances NETosis, may not elicit similar NO levels in PCD patients, potentially explaining the reduced NETs formation observed. This questions PMA's utility for *ex vivo* stimulations in this context since other physiologically relevant stimuli, such as LPS, have been shown to not induce NO in neutrophils. This research advocates to further explore the complex nature of NETs in PCD.

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HL-60 CELLS AS AN IN VITRO MODEL FOR STUDYING NETOSIS IN RESPONSE TO PSEUDOMONAS AERUGINOSA LIPOPOLYSACCHARIDE

Sonya J. Malavez-Cajigas, MPH[1]; Fabiana I. Marini-Martínez, MS[1]; Karla J. Rosario-Pacheco[1]; Lourdes M. Caro-Rivera[1]; Mercedes Lacourt-Ventura, MS[1]; Bethzaly Velázquez Perez[1], Marcos J. Ramos-Benítez, PhD[1]

[1]Basic Sciences Department, Ponce Research Institute & Ponce Health Sciences University, Ponce, Puerto Rico, 00732

INTRODUCTION: Neutrophil Extracellular Traps (NETs) play a dual role in infectious diseases, influencing both immune responses and disease progression. Understanding this complex process is essential for uncovering its clinical implications. However, studying NETosis in primary neutrophils has significant challenges, such as brief lifespan, phenotypic variability, and inability to be cryopreserved. Therefore, researchers regularly use neutrophil-like cells for functional analyses. In this study, we assessed the NETosis capacity of HL-60 cells in response to Lipopolysaccharide (LPS) and compared their responses to those of primary neutrophils.

METHODS: We isolated neutrophils from the blood of healthy donors using magnetic separation. Also, we cultured HL-60 cells, differentiating them into neutrophil-like cells. NETosis was induced with varying concentrations of LPS from Pseudomonas aeruginosa (10 – 100 µg/ml). We quantified NETosis using live cell imaging technology and performed immunofluorescence to confirm the presence of NETs structures.

RESULTS: HL-60 cells exhibited significantly increased NETosis compared to non-stimulated cells when stimulated with LPS at concentrations of 75 µg/ml or above ($P<0.05$). Immunofluorescence confirmed the formation of NETs in HL-60 cells 2 hours after LPS stimulation. However, NETosis levels in HL-60 cells were significantly lower than those observed in primary neutrophils at equivalent LPS concentrations ($P<0.05$).

CONCLUSION: Our results indicate that HL-60 cells cannot fully replace primary neutrophils in this context. However, they still offer a feasible in vitro model for exploring the underlying mechanisms of NETosis induced by LPS. This study starts to evaluate how this cell line could be useful to study NETosis in the context of bacterial infections.

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ROLE OF MITOCHONDRIAL DNA DAMAGE IN THE MAINTENANCE OF MITOCHONDRIAL DYNAMICS IN A HUMAN HEPATOMA CELL LINE

Moraima Sosa-Porrata, MS[1]; Sabrina L. Correa-Rivera, BS[2]; Sylvette Ayala-Peña, PhD[3]; Carlos A. Torres-Ramos, PhD[2].
[1]Instituto Tecnológico de Puerto Rico, Manatí, Puerto Rico;
[2]Department of Physiology, University of Puerto Rico Medical Sciences, San Juan, Puerto Rico;
[3]Department of Pharmacology and Toxicology, University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico

INTRODUCTION: Mitochondrial dynamics, encompassing fusion and fission processes, is vital for maintaining mitochondrial function and eliminating damaged components, including mitochondrial DNA (mtDNA). Imbalances in mitochondrial dynamics can contribute to various diseases affecting underserved populations. The OPA1 protein plays a key role in mitochondrial dynamics, with the long isoforms of OPA1 (long-OPA1) prevalent over the short-OPA1 during mitochondrial fusion. MtDNA repair, particularly base excision repair (BER), is another mechanism crucial for maintaining functional mitochondria. This study explores the relationship between mtDNA damage and mitochondrial dynamics, hypothesizing that mtDNA damage alters mitochondrial dynamics.

METHODS: The impact of DNA damage induced by the alkylating agent methyl methanesulfonate (MMS) on mitochondrial dynamics was assessed in the human hepatoma cell line, HepG2. Specifically, OPA1 isoforms were analyzed after exposing cells to 6mM MMS for 30 minutes. Western Blot analysis of whole-cell protein lysates at different time points post-treatment was employed to detect changes in the long-OPA1 versus short-OPA1 ratios.

RESULTS: Preliminary results demonstrate statistically significant decreases in the long-OPA1/short-OPA1 ratios at 12-, 24-, 48-, and 72 hours post-treatment, suggesting that DNA damage alters mitochondrial dynamics.

CONCLUSION: Our findings indicate that mtDNA damage alters mitochondrial dynamics by inhibiting mitochondrial fusion. These results provide an initial step toward understanding the interplay between mtDNA repair and mitochondrial dynamics, offering insights into potential therapeutic targets for diseases associated with mitochondrial dysfunction in underserved populations.

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IRB approval number: Not applicable. The study was performed using a commercially available cell line.

AN *IN VITRO* MODEL TO STUDY THE EFFECTS OF LEAD IN A DOPAMINERGIC CELL LINE

Lizbeth Vázquez Casul, BS, MSc[1]; Ricardo A. Schrils Soto, BSc[2]; Jennifer L. Barreto-Estrada, PhD[1]; María I. De Jesús-Burgos, PhD[3]; Juan C. Jorge Rivera, PhD[1].
[1]Department of Anatomy and Neurobiology, University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico;
[2]Department of Biology, Faculty of Natural Sciences, University of Puerto Rico-Rio Piedras Campus, San Juan, Puerto Rico;
[3]Department of Biology, University of Puerto Rico-Cayey Campus, Cayey, Puerto Rico.

INTRODUCTION: Parkinson's Disease (PD), one of the most common neurodegenerative diseases, is characterized by the loss of dopaminergic neurons in the substantia nigra. Of growing concern is environmental pollution with lead (Pb) and its plausible association with PD. Since Cytochrome C (CytC) plays a pivotal role in both the electron transport chain and apoptosis, we aim to determine whether Pb modulates the relative levels of this protein. If so, this could provide a study model to shorten the bridge between a possible etiology of neurodegenerative diseases and the effects of exposure to environmental pollutants, such as heavy metals.

METHODS: N27a cell line was seeded and sub-cultured. At an estimated density of 85%, cells were exposed to Pb at 10^{-7} M, 10^{-6} M or 10^{-5} M for a period of 24 hours. Proteins were extracted and Western Blot (WB) analysis was conducted in triplicates to evaluate the relative levels of CytC.

RESULTS: WB's densitometric analyses yields paradoxical effects at 10^{-5} M Pb, where 2 sets of experiments showed a diminution of CytC relative levels, and 2 sets showed a slight increase or no change.

CONCLUSION: It is necessary to confirm this preliminary result with ELISA and to quantify the effects of 10^{-5} M Pb on dopaminergic cell survival. Conversely, chronic, rather than acute, exposure to Pb might dictate the fate of dopaminergic neurons.

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REGULATION OF EXTRACELLULAR VESICLE POPULATIONS RELEASE IN GLIOBLASTOMA CELLS BY PYK2 AND MEK/ERK SIGNALING

Neisha Ramírez Serrano; Felix Y. Narváez Irizarry; Emir Rinaldi Pérez; Lilia Kucheryavykh, PhD.
Department of Biochemistry, Universidad Central del Caribe, Bayamon, PR, 00956

INTRODUCTION: Glioblastoma (GBM), the deadliest brain cancer, is typically fatal within a year despite treatment. Tumor-associated myeloid cells (TAMs) support GBM growth, treatment resistance, and immune surveillance via extracellular vesicles (EVs), which exchange biomolecules. EVs travel through the bloodstream, triggering signaling pathways in distant organs, recruiting cells, and modulating immune responses, crucially regulating the tumor immune microenvironment. We hypothesize that Pyk2/MEK/Erk signaling regulates EV release by modulating the actin cytoskeleton, impacting TAM activation in GBM. This study aims to investigate the role of Pyk2/MEK/Erk in EV release in GBM cells, potentially offering insights into therapeutic targets.

METHODS: Two humans primary GBM cell lines with and without Pyk2 CRISPR/Cas9 knock-out (Pyk2KO) were used. Confocal imaging and flow cytometric analysis of EVs, purified from cell conditioned medium were employed.

RESULTS: The study identified that knocking-out Pyk2 shifted EVs to the population of smaller diameter. Using Integrin as plasma membrane marker, we identified 84.70% Integrin+ and 15.30% Integrin- EV's, purified from medium conditioned from WT cells, compared to 89.07%/10.93% from Pyk2KO cells, respectively. Treatment with Erk/MEK inhibitor Avutometinib altered EVs populations to 79.11% Integrin+ and 20.89% Integrin-. Combining Avutometinib with Pyk2 knock-out resulted in 78.83% Integrin+ EV and 21.17% Integrin-.

CONCLUSIONS: Pyk2 is responsible for the upregulation of EV's derived from the endoplasmic reticulum. Conversely, Mek/Erk signaling primarily enhances the release of EVs shed from the plasma membrane. Overall, these findings underscore the interplay between Pyk2, Erk/MEK signaling, and plasma membrane dynamics in regulating EV biogenesis and composition.

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All experimental procedures were carried out in accordance with the broad consent approved by the Institutional Review Board (IRB) Human Research Subject Protection Office (protocol #2012-12B, July 16, 2019).

IMPACT OF *S.MARCESCENS* LIPOPOLYSACCHARIDE IN REDUCING ONCOGENIC PHENOTYPES IN ORAL SQUAMOUS CELL CARCINOMA

Jeannette L. Salgado-Montilla, MS[1]; Gabriel Borges-Vélez, PhD[1]; Angel J. Amaral-Maisonet[1,2], Jurelis Torres-Reyes, MS[1]; Esther A. Peterson-Peguero, PhD[1,2]; Josué Pérez-Santiago, PhD[1,3].
[1]University of Puerto Rico Comprehensive Cancer Center, San Juan, PR;
[2]University of Puerto Rico Río Piedras Campus, San Juan, PR;
[3]University of Puerto Rico Medical Sciences Campus, School of Dental Medicine, San Juan, PR.

INTRODUCTION: Oral squamous cell carcinoma (OSCC) is a globally prevalent and highly aggressive cancer with a 5-year survival rate of 60%. The complexity of its multi-factorial mechanism is a challenge for the development of preventive and therapeutic strategies. Shifts in lipopolysaccharides (LPS), from Gram-negative bacteria in the oral cavity, can significantly alter the tumor microenvironment influencing inflammation, metabolism, and introducing toxins that potentially impact cancer progression.

METHODS: OECM-1 cells were used as the model for OSCC. The cells were cultured and treated with LPS from *Serratia marcescens* starting at 11 mM concentration (1:2 dilution factor) to test viability. We measured changes in oncogenic phenotypes by performing proliferation, migration, and invasion assays for 24 hours (h) and 48h with LPS treatments at concentrations of 2.75mM and 5.5mM.

RESULTS: Higher concentrations of LPS significantly reduced cell viability, with an inhibitory concentration of 50% (IC50) values of 13mM and 5.8mM at all time points. LPS treatment at 5.5mM showed a 50% reduction in cell proliferation ($p=0.0472$) and migration area ($p=0.0419$) compared to untreated cells. No significant differences were observed at the 2.75mM concentration. Morphological changes were noted at both 2.75mM and 5.5mM concentrations.

CONCLUSION: LPS from *S. marcescens* can decrease oncogenic phenotypes in the OSCC cell model. Our results suggest that there could be host response variation to LPS dependent on bacterial-induced modifications, which may impact inflammation-related cancer progression. LPS from *S. marcescens* could be a novel alternative to influence tumor growth by altering the oncogenic phenotype of cells in OSCC.

CHARACTERIZATION OF MYELOID-DERIVED SUPPRESSOR CELLS IN RESPONSE TO RESTRAINS STRESS IN PRECLINICAL MODELS OF OVARIAN CANCER

Yadiel A. Rivera-López, BS[1]; Alexandra N. Aquino-Acevedo, PhD[1]; Yesenia Castillo-Ocampo, PhD[1]; Melanie Ortiz-León, BS[1]; Luinet L. Meléndez-Rodríguez, BS[1]; and Guillermo N. Armaiz-Pena, PhD[1,2].

[1]Department of Basic Sciences, Division of Pharmacology, School of Medicine, Ponce Health Sciences University, Ponce PR; [2]Divisions of Cancer Biology and Women's Health, Ponce Research Institute, Ponce PR.

INTRODUCTION: Ovarian cancer (OC) is the fifth- and seventh-leading cause of cancer death among females in the United States and Puerto Rico, respectively. Chronic stress has been shown to increase tumor-associated inflammation, immunosuppression and promote disease progression. Myeloid-Derived Suppressor Cells (MDSC) are immature and immunosuppressive cells that play a key role in the tumor microenvironment (TME). However, the role of chronic stress on MDSC infiltration and function in OC is poorly understood. This study aims to determine the role of chronic stress on MDSC biology in the OC TME. We hypothesize that chronic stress enhances MDSC infiltration into OC TME and drives OC progression.

METHODS: To address this, we inoculated 3 to 4-month-old C57BL/6 female mice with ID8 or IG10 OC cells and subjected them to restraint stress (2 hours daily) for 6-8 weeks. Tumors were analyzed by immunofluorescence (IF) and flow cytometry (FC) to characterize MDSC by the expression of cell surface markers ($CD11b^+$ and $Gr\text{-}1^+$ (Ly-6G/Ly-6C). In addition, we performed bone marrow isolation from C57BL/6 mice to obtain myeloid cell precursors and differentiate them *ex-vivo* into MDSC using GM-CSF and IL-6.

RESULTS: Our results suggest that chronic restraint stress led to increased infiltration of MDSC in the TME in ID8 (p=0.0001) and IG10 (p=0.0013) mouse models. FC results show increased infiltration of MDSC (p=0.04) in IG10 tumors and enrichment of polymorphonuclear-MDSC in stress hormone-treated groups.

CONCLUSION: These results suggest that chronic stress can regulate MDSC infiltration and function and enhance the immunosuppressive nature of the OC TME.

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TARGETING AURKA AND AURKB AS A NOVEL THERAPEUTIC STRATEGY AGAINST TRIPLE-NEGATIVE BREAST CANCER PATIENTS.

Joel A. Orengo Orengo MS[1], Melanie E. Cruz BS[1], Alexandra N. Aquino-Acevedo PhD[1], Harold I. Saavedra, PhD[1].
[1]Ponce Research Institute, Ponce Health Sciences University, Ponce, Puerto Rico.

INTRODUCTION: Women of African heritage, including non-Hispanic black (NHB), black Hispanic/Latino (H/L), and Caribbean Hispanic/Latino women (including Puerto Rican) are more likely to be diagnosed with triple-negative breast cancer (TNBC) and have a poorer prognosis than non-Hispanic White (NHW) and White H/L. The dysregulation of mitotic kinases can activate molecular pathways involved in expressing epithelial-to-mesenchymal transition (EMT) biomarkers. Using the Cancer Genome Atlas database, we identified higher expressions of AURKA and AURKB in NHB women compared to NHW women and higher expressions of AURKB in NHB women with TNBC. Our studies aim to inhibit the expression of mitotic kinases such as AURKA and AURKB in TNBC to evaluate the effects on early metastasis. Therefore, we hypothesize that inhibiting AURKA and AURKB will decrease EMT biomarkers and early metastasis in women of African heritage.

METHODS: SiRNA-mediated knockdown, immunoblotting, and qRT-PCR with EMT biomarkers were performed using the MDA-MB-231 cells (NHW), MDA-MB-157 (NHB), and HCC70 (NHB) TNBC cells.

RESULTS: Western blots indicate that the downregulation of AURKA and AURKB expression may lead to a decreased of EMT biomarkers such as N-cadherin and Vimentin. In addition, preliminary data suggests a decrease in the expression of AURKA, AURKB, Vimentin, and N-cadherin mRNAs, while the expression of E-cadherin increased.

CONCLUSION: These results indicate the potential use of mitotic kinase inhibitors as therapies against TNBC. Ultimately, we will study the combined inhibition of AURKA and AURKB in TNBC cell lines and PDX models from women of African heritage.

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IMPACT OF ERGOSTEROL PEROXIDE, PACLITAXEL, AND THEIR COMBINATION ON KI-67 EXPRESSION IN TNBC XENOGRAFTS

Iris I. Sánchez-Lebrón, BS[1]; Rene A. Vega-Mercado[2]; Miguel Noy, MD[3]; Michelle M. Martínez-Montemayor, PhD[1].
[1]Department of Biochemistry, Universidad Central del Caribe-School of Medicine, Bayamón, PR;
[2]Department of Biology, University of Puerto Rico, Mayagüez Campus, Mayagüez, PR;
[3]Laboratorio de Patología Dr. Noy, San Juan, PR.

INTRODUCTION: Triple Negative Breast Cancer (TNBC) is a lethal breast cancer subtype with no targeted therapies available. The natural compound, Ergosterol Peroxide (EP), has exhibited selective anti-cancer and anti-proliferative effects in TNBC with minimal toxicity to healthy tissue.

METHODS: To explore its potential, our objective in this study was to assess EP's *in vivo* anti-proliferative effect. A histopathological analysis on murine tumor tissue excised from xenografts generated from two TNBC cell lines, SUM-149 and MDA-MB-231 was conducted. Mice were treated with vehicle, EP, Paclitaxel (PTX), or their combination. Paraffin embedded formalin-fixed tumor tissue slides for H&E, Ki-67, and unstained paraffin-embedded tissue were prepared by a pathologist. Ki-67 expression was evaluated in ten high-power fields (HPF) at X400 overall magnification per slide, categorized as low or high, and further classified by percentage.

RESULTS: Ki-67 expression in SUM-149 slides was not different (p-value = 0.47) in EP treated mice and was numerically lower in combination treated (p-value = 0.09) mice. MDA-MB-231 cell line tissues exhibited uniformly high Ki-67 expression, regardless of treatment (p-value for EP study=1.0). Ki-67 analysis of the combination study in MDA-MB-231 tumors revealed a p-value = 0.05, which is statistically significant and demonstrates a decrease in proliferation, where the combination of EP and PTX was most effective.

CONCLUSION: Our findings suggest that EP holds a promising potential as an effective treatment option for TNBC patients, especially when combined with other drugs. Nonetheless, further research of EP is recommended, particularly in combination with PTX.

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EVALUATING ERGOSTEROL PEROXIDE'S IMPACT ON TNBC METASTASIS

Luz V Arroyo-Cruz, PhD[1]; Paola S. Rivera-Fuentes, BS[2]; Israel Almodóvar, PhD[3]; Taotao Ling, PhD4; Fatima Rivas, PhD[4]; Michelle M Martínez Montemayor, PhD[1].

[1]Department of Biochemistry, Universidad Central del Caribe - School of Medicine, Bayamón, PR;
[2]Department of Biology, University of Puerto Rico, Río Piedras Campus, San Juan, PR;
[3]Department of Mathematics, University of Puerto Rico, Mayagüez Campus, Mayagüez, PR;
[4]Department of Chemistry, Louisiana State University, Baton Rouge, LA.

INTRODUCTION: Triple-negative breast cancer (TNBC), constituting 15% of breast cancers, exhibits lower survival rates due to rapid growth and spread. TNBC lacks estrogen receptors (ER), progesterone receptors (PR), and HER2 receptor expression. TNBC is more common in Hispanic and African American women. Racial disparities exist in metastatic TNBC, where ~25% of TNBC patients face metastases, affecting lungs, liver, and brain. Ergosterol peroxide (EP), is a selective anti-TNBC therapeutic, however its anti-metastasis properties have not been investigated until now.

METHODS: In this study, the effects of EP on cancer cell metastasis to the lungs in mice injected with the MDA-MB-231 TNBC cell line were analyzed. Female athymic nu/nu mice (n=18/group) received GFP-MDA-MB-231 cell injections and were divided into vehicle and EP groups. EP was administered at 100mg/kg BW via oral gavage. Organs were collected, imaged, and analyzed for metastatic foci using ImageJ software. Data analysis utilized Microsoft Excel, GraphPad Prism, and R software.

RESULTS: Results evidence a highly significant ($P<0.001$) decrease in the metastasized tumor area in EP-treated mice compared to the vehicle group. These significant EP-induced anti-metastasis results were seen for the metastatic foci area in the lung and liver. However, although there were a smaller number of metastatic foci between in the EP-treated group vs. the vehicle mice, this difference was not statistically significant.

CONCLUSION: This study suggests the treatment with EP has potential anti-metastasis effects which increases the potential of EP as a potent anti-cancer agent.

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PUERTO RICAN BEAUTY PAGEANT CONTESTANTS AND THEIR USE OF ULTRAVIOLET RAY TANNING BEDS: A TRANSVERSAL STUDY.

Laura I. Ortiz López, MS-III; Maillim I. Ortiz López, MS-III;
Camila N. Fontane, MS-IV; Eneida De La Torre, M.D.
Universidad Central del Caribe, Bayamón, Puerto Rico

INTRODUCTION: Having tanned skin has become popular among beauty pageant contestants. Ultraviolet rays cabins emit UVA/UVB rays and using them before age 20 has been proven to increase the risk of melanoma by 47%. This study explores the knowledge Puerto Rican contestants have about indoor tanning, its associated health risks, motivations to seek this service, and whether they developed skin cancer.

METHODS: A 21-question survey was administered to adults who participated in a beauty pageant in Puerto Rico and used ultraviolet tanning beds/booths at least once. The survey was distributed through social media. The questions were related to participants' demographics, their health, use of UV tanning cabins, and the development of skin malignancies.

RESULTS: The questionnaire was completed by 46 participants. 26.1% of them did not know about the risk of developing skin cancer after UV cabin exposure. Cutaneous diseases present among participants before exposure include atopic dermatitis (10.8%), psoriasis (4.3%), and vitiligo (2.2%). At the time of data collection, 100% of them had not been diagnosed with skin cancer. However, 17.4% had a family history of skin malignancy. Regarding motivations, 8.7% stated it was mandatory for the pageant competition while 74% claimed someone suggested it to them.

CONCLUSION: This research emphasizes the need to raise awareness regarding the long-term side effects associated with indoor tanning within the beauty industry. Encouraging individuals to prioritize their skin health by utilizing alternative tanning methods, such as self-tanning sprays or lotions, in order to avoid excessive exposure to UV radiation is essential.

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STRESSORS AND RESILIENCE: A STUDY OF ORTHOPAEDIC SURGEONS IN PUERTO RICO

Gerardo E. Rodríguez-Matias, BS[1]; Gabriel Gonzalez-Diaz, MS[1]; Joshua Vivas, MS[1]; Francis Cedeño, BS[2]; Emil Varas-Rodríguez, MPH[1]; Jerry Cruz, BS[2]; Hans Hess, MD2; Oscar Duyos, MD, FAAOS[3]
[1]Ponce Health Sciences University, School of Medicine, Ponce, PR, 00716;
[2]University of Puerto Rico, School of Medicine, San Juan, PR, 00921;
[3]Menonita Medical Center, Cayey, PR, 00736

INTRODUCTION: Physician burnout, characterized by exhaustion, depersonalization, and decreased accomplishment, is a well-documented phenomenon with adverse effects on healthcare delivery. In Puerto Rico, orthopaedic surgeons face an increased risk of burnout. This vulnerability stems not only from a low surgeon-to-population ratio but also from the island's healthcare system's challenges. These challenges include physician migration, economic disparities, privatization, and a predisposition for natural disasters. Despite these significant stressors, the prevalence and impact of burnout within this specific cohort remain unexplored.

METHODS: We administered a cross-sectional survey containing the Maslach Burnout Inventory-Human Services Survey, General Health Questionnaire-12, and Revised Dyadic Adjustment Scale. 67 orthopaedic surgeons and 27 of their partners participated, representing over 60% of the island's orthopaedic workforce.

RESULTS: The survey disclosed a burnout prevalence of 1 in 4 surgeons (28.4%), stating a high risk of emotional exhaustion (58.2%) and depersonalization (37.3%), but counterbalanced by a robust sense of personal accomplishment (94.0%). Regarding stressors, over two-thirds identified the healthcare system and private insurance restrictions (66.7%). In terms of mental health, some (25.4%) exhibited symptoms of concern. Finally, a portion of surgeons (22.0%) and their partners (14.8%) reported relationship distress.

CONCLUSIONS: The determined prevalence of burnout among orthopaedic surgeons in Puerto Rico uncovers a complex interplay between resilience and healthcare system challenges. The high personal accomplishment rate suggests protective factors but does not mitigate significant emotional exhaustion and depersonalization. These results emphasize the need for further research on targeted interventions and policy changes in Puerto Rico's healthcare system.

Funding: N/A

IRB approval number: This study was conducted in accordance with guidelines and protocols approved by the Institutional Review Board at Ponce Health Sciences University (Protocol #2306153075).

SCREENING TESTS ADHERENCE OF PUERTO RICAN POPULATION PARTICIPATING IN MEDICINA URBANA'S CLINICS: A MOBILE HEALTH CLINIC DESCRIPTIVE STUDY

Jean Pérez Verdejo; Andrés Gorbea; Myrmarie Cruz; Andrea Vélez Figueroa; Cecilia Olmo López; Delmarie M. Rivera Rodríguez; Andrea Firpo Pabon; Jose Encarnación; Rychel Torres Rodríguez.
Universidad Central del Caribe. Faculty Advisor: Dr. Iris Parrilla,
School of Medicine Address: Universidad Central del Caribe, PO BOX 60327
Bayamón, PR, 00960-6032, Phone: (787) 420-0054 (Andres Gorbea)

INTRODUCTION: This study examines the awareness and adherence to recommended screening tests among the Puerto Rican population attending Medicina Urbana's community clinics, aiming to identify factors influencing adherence and improve preventive healthcare practices.

METHODS: A descriptive study utilizing a mobile health clinic model was conducted, involving recruitment of participants aged 21-80 years from Medicina Urbana's clinics. An anonymous survey assessed participants' knowledge and adherence to screening tests, with data securely managed via REDCap and analyzed for correlations using Epi Info software. Ethical considerations were rigorously followed, with informed consent obtained through QR codes.

RESULTS: The findings from the study include increased awareness and adherence to screening tests, attributed to targeted informational campaigns and interventions. The study expects to develop accessible health resources within the clinics, enhancing patient-provider communication and promoting personalized preventive care strategies. These efforts aim to foster a proactive healthcare culture among the Puerto Rican community served by Medicina Urbana.

CONCLUSION: The research highlights the importance of tailored educational and outreach initiatives in improving screening test adherence. By addressing identified barriers and enhancing health literacy, Medicina Urbana's clinics can significantly impact preventive health behaviors, reducing preventable diseases and promoting well-being in the Puerto Rican population.

QUALITY OF AN ASSISTIVE TECHNOLOGY APP FOR OLDER ADULTS WITH DISABILITIES: PRIMARY CARE PHYSICIAN'S PERSPECTIVE

Elsa M. Orellano, PhD[1]; Wency L. Bonilla Díaz, MPH[2]; Radamés Revilla Orellano, MDS[3]; Jesús Mejías Castro, B.S.S[4]
[1]University of Puerto Rico Medical Sciences Campus, School of Health Professions, Occupational Therapy Program, San Juan, Puerto Rico;
[2]Huertas College, School of Health, Caguas, Puerto Rico;
[3]University of Puerto Rico Medical Sciences Campus, School of Medicine, San Juan, Puerto Rico;
[4]University of Puerto Rico Humacao Campus, Biology Department, Humacao, Puerto Rico

INTRODUCTION: Lack of information has been reported to be the main barrier to access assistive technology (AT) among older Hispanic living in Puerto Rico. This study aimed to assess the quality of *My Assistive Technology Guide* (MATG) among Primary Care Physicians (PCPs) to increase older Latinos' access to AT and describe the PCPs experiences using the MATG.

METHODS: In this pilot usability project, ten PCPs were trained in the use of the MATG prior to using it for 30 days. At the end of the usage period, a mixed method design was used to simultaneously collect quantitative data using the *User Mobile Application Scale* (uMARS) and qualitative data through interviews. Data analysis included descriptive statistics and a thematic content analysis.

RESULTS: The overall uMARS mean score was high (4.4 ± 0.61). Functionality domain obtained the highest rating (mean 4.8 ± 0.53) while customization domain obtained the lowest (mean 2.3 ± 0.43). Subjective quality was rated high (mean 3.0, IQR 1.0). The PCPs reported a positive experience using the MATG to learn and inform older adults about AT and provided recommendations to improve the MATG and support its use as part of their medical practice.

CONCLUSIONS: The results indicated a high quality and usefulness of the MATG, suggesting that it might be a useful tool for PCPs' management of older adults' functional disabilities. Future research is recommended to assess the effectiveness of the MATG in the prevention and management of older adults' functional disabilities.

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ASSOCIATION OF ADVERSE CHILDHOOD EXPERIENCES AND PERCEIVED SOCIAL SUPPORT WITH DEPRESSION LEVELS IN NICU MOTHERS.

Roberto Y. Rodriguez Lozada[3]; Paula C. Román Villamil[3]; Gabriela M. Vera Santiago[3]; Yelenis Díaz Vicioso[3]; Darielie L. Rivero Rolón[3]; Andrea C. Morales Dávila, BS[3]; Mariela V. Pérez Otero[3]; Polaris González-Barrios, PhD[2]; Cynthia García Coll, PhD[1]; Zayhara Reyes Bou, PhD[1]; Inés García García; MD[1], Lourdes García Fragoso, MD[1], José Martínez González, PhD[4]

[1]Department of Pediatrics, University of Puerto Rico, Medical Sciences Campus;
[2]Department of Psychiatry, University of Puerto Rico, Medical Sciences Campus;
[3]Department of Natural Sciences, Undergraduate, University of Puerto Rico, Río Piedras Campus, and Bayamón Campus.
[4]Department of Clinical Psychology, Carlos Albizu University, San Juan, Puerto Rico.

INTRODUCTION: Admission of a newborn to the Neonatal Intensive Care Unit (NICU) could pose emotional distress for mothers, especially those who experienced adverse events during childhood or perceive weak social support. This study aims to determine the association between maternal adverse childhood experiences (ACEs), perceived social support, and signs of depression.

METHODS: Mothers with neonates in the NICU-Pediatric Hospital of PR (n=102) were interviewed using a structured psychological assessment protocol. Interview sections included: the Patient Health Questionnaire (PHQ-9), the Multidimensional Scale of Perceived Social Support Scale (MSPSS), and the ACEs questionnaire with 10 items of possible adverse events during childhood. Descriptive statistics were used to assess tendencies, frequencies, and means. Associations between each score were analyzed using Spearman's correlation (due to sample skewness) and general linear models (CI- 95% confidence and $p<.05$) using SPSSv. 29.

RESULTS: A statistically significant correlation ($p<0.05$) was seen between the number of ACEs and MSPSS responses, where mothers with more ACEs tended to perceive weaker social support regardless of their PHQ-9 responses. The overall correlation between PHQ-9 and ACEs was insignificant ($p>0.05$). A general linear model sustains the association of ACEs and MPSS with no impact on depression.

CONCLUSION: Perceived social support during prenatal and postnatal periods seems to decrease as ACEs increase. Further assessment of the impact of other socio-demographic variables on how mothers perceive social support is warranted. These results point to the need for proper maternal mental health interventions to increase support within the NICU environment.

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BREASTFEEDING PRACTICES AND CHALLENGES DURING THE FIRST 6 MONTHS OF LIFE: PRELIMINARY RESULTS

Laura Geroy MD[1]; Norma Claudio MD[2];
Lourdes García Tormos Ed.D., CCC-SLP, BCS-S, IBCLC, CNT [2];
Lourdes García Fragoso MD[2], Ashley Diaz MD[1];
Zayhara Reyes-Bou MD[2]; Inés García García MD[2]
[1]San Juan City Hospital;
[2]Neonatology Section, Department of Pediatrics,
Medical Sciences Campus, University of Puerto Rico

INTRODUCTION: The World Health Organization (WHO) and The American Academy of Pediatrics (AAP) have recommended exclusive breastfeeding (EBF) for the first 6 months after giving birth. Despite benefits, mothers discontinue breastfeeding prematurely due to obstacles encountered, such as inadequate support, cesarean deliveries, early return to work, and lack of information.

METHODOLOGY: Descriptive prospective cohort study of 200 non-adolescent mothers who delivered neonates with a gestational age of at least 36 weeks at San Juan City Hospital from May 1, 2022, to January 31, 2023. Mothers were contacted by telephone to complete questionnaires after obtaining written consent. Epi info was used for analysis. IRB approved (010522).

RESULTS: During the interval analyzed, 70 mothers answered the questionnaire at 1 month, where 50.5% reported breastfeeding, 36.6% breastfed supplemented with formula, and 49.5% denied breastfeeding. Of the surveyed mothers, 68.32% reported no barriers to lactation. Most common barriers included: baby did not want to breastfeed (12.87%), work commitments (6.93%), stress (5.94%), and lack of time (4.35%). 76.56% of mothers received breastfeeding information upon hospital discharge. Although most mothers denied barriers to breastfeeding, most of them experienced unsuccessful exclusive breastfeeding. Lack of timely information by Pediatricians or OB-GYNs after hospital discharge may have contributed to some of these barriers.

CONCLUSIONS: Despite denying barriers, a high rate of unsuccessful exclusive breastfeeding was found in our population. Pediatricians should promptly provide education and support immediately after birth with appropriate coordination of outpatient resources to increase exclusive breastfeeding.

ENHANCING BREASTFEEDING PRACTICES: INTERVENTIONAL STUDY IN THE HISPANIC POPULATION OF PUERTO RICO

Liana Cortes, MD[1]; Jeyka Marin, MD[1]; Jose Martin, MD FACOG[1].
[1]Department of Obstetrics and Gynecology, San Juan City Hospital, San Juan Puerto Rico

INTRODUCTION: While initiating breastfeeding rates rise, recent data highlights a notable decline after the initial 6 months, with 84% of Caucasian mothers initiating breastfeeding, but only 25% sustaining it for 6 months. In Puerto Rico, 51% of infants were exclusively breastfed up to three months, yet only 31% reached the 6-month mark. Our aim is to enhance breastfeeding rates in Puerto Rico through the distribution of educational materials and the identification of barriers impeding breastfeeding.

METHODS: Educational video was shown, then a self-administered questionnaire about desire, knowledge, and barriers of breastfeeding was given to patients.

RESULTS: 108 patients responded to the questionnaire. Educational video and explanations were provided only 22.2% of women felt totally oriented and 33.92% felt regularly oriented. Common barrier identified was "short maternity leave" with 13.43%. 32% of the women do not know that the hospital provided education by a certified nurse specializing in breastfeeding, 60% of the women indicate getting information from the internet and 23% received information by an OBGYN and 32% in the hospital.

CONCLUSION: Recognizing prevalent obstacles allows us to play a role in elevating the breastfeeding rate within the Hispanic community, promoting extended breastfeeding duration. Particularly worrisome is the fact that only a small proportion of women received guidance from their Obstetrician-Gynecologist. To address these challenges, it is crucial to reinforce the importance of doctors and medical staff being advocates for and possessing basic knowledge about breastfeeding. Our discoveries underscore the necessity of incorporating additional counseling during hospital admission and prenatal care.

IRB approval number: San Juan City Hospital 00002788

UNDERSTANDING THE COLLECTIVE PERSPECTIVE OF PUERTO RICO SOCIETY ON ABORTION: ATTITUDES, BELIEFS AND BEHAVIORS

Gustavo Cruzado, MD, FACOG[1]; Liana Cortes, MD[1]; Carolina Casalduc, MD[1]; Claudia Cruzado, MS[2]; Patricia Meléndez, MS[2]
[1]Department of Obstetrics and Gynecology, San Juan City Hospital;
[2]Universidad Central del Caribe

INTRODUCTION: In 2022, Puerto Rico reported approximately 4,200 abortions, reasons behind women's thoughts on this topic have not been reported. In 2017, three-quarter of Puerto Ricans living in rural areas expressed opposition to abortion. Study aims to understand Puerto Ricans' perspective concerning abortion, identifying factors that influence opinions and beliefs.

METHODS: Validated questionnaire was completed by the respondents. Descriptive and analytical data was analyzed.

RESULTS: N=200 (150 women and 50 men) respondents completed the questionnaire. Women (62.86%) responded that the decision of abortion should be of the "women-only" and men (55.56%) responded that decision should be from the "women and partner". Based on the highest educational level, respondents with doctorate and baccalaureate feel oriented the most about abortion and reported receiving appropriate education. 45% of the women and 55% of the men reported having recommended the abortion procedure for themselves or for someone else. Factors that influenced their opinion; 60% of women and 89% of men responded, "evidenced based medicine", followed by "religious beliefs" with 38% of women and 11% of men and the third one "family opinion" with 28% of women and 22% of the men.

CONCLUSIONS: Different opinions exist concerning abortion. Socioeconomics, religion, cultures, gender, among others play a critical role in opinion. Our findings reveal that our population needs education, which is essential for promoting health, safety, autonomy and reproductive rights. Giving accurate information we can empower individuals to make informed consent decisions and ensure legal abortion services for those who need them.

Acknowledgments: No conflicts of interest to disclose.

IRB approval number: 00002788

MAPPING TRANSLATIONAL RESEARCH COLLABORATIONS: INSIGHTS FRON AN IDeA CLINICAL RESEARCH CENTER

Carlamarie Noboa-Ramos, MS, PhD[1]; Mariela Lugo Picó, MS[1]; Luisa Morales, DrPH[2]; Vicmag Cabrera, BA[3], Loren A. Meléndez, MS[1].
[1]University of Puerto Rico, Medical Science Campus, San Juan, Puerto Rico;
[2]Ponce Health Science University, Ponce, Puerto Rico;
[3]Universidad Central del Caribe, Bayamón, Puerto Rico

INTRODUCTION: Delving into the intricate web of translational research collaborations, our study aims to analyze the evolving landscape of the Hispanic Alliance of Clinical and Translational Research from 2020 to 2023 using cutting-edge Social Network Analysis (SNA).

METHODS: We conducted a systematic document review of all the Hispanic Alliance Calls for Pilot Projects from 2020 to 2023 including key attributes of the investigators and collaborators (e.g., academic institution, highest degree, collaborator type). Scientific collaboration was defined as two or more researchers working together in grant proposal for a pilot project application. Study data was recorded and tracked using an Excel spreadsheet. R-Statistical software was used to analyze and map the networks resulting from collaboration interactions comparing the 2020 Call and 2023 Call. Network statistics were performed including nodes, isolates, edges, components, density, diameter, average degree, and the size of the main component.

RESULTS: Within a vibrant network comprising 134 investigators, clinicians (49.3%) and basic researchers (25.4%) are predominant. Initial findings showcase a remarkable surge in interdisciplinary collaborations and affiliations over time. Notably, the number of translational research clusters surged from 4 to 13, with mentorship emerging as a critical conduit bridging diverse research clusters; 16 to 65 nodes in comparison from 2020 to 2023.

CONCLUSION: This groundbreaking study unveils the intricacies of IDeA CTR translational research dynamics, showing a palpable surge in collaboration diversity and depth. By harnessing data-driven insights, our approach catalyzes informed decision-making to amplify collaboration, diversity, and program efficacy, offering invaluable guidance for policy and practice.

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EMPOWERING COMMUNITY ENGAGEMENT: ASSESING THE IMPACT OF THE HISPANIC ALLIANCE'S COMMUNITY HEALTH AND RESEARCH COUNCIL

Carlamarie Noboa-Ramos, MS, PhD[1], Mariela Lugo Picó, MS[1], Edna Acosta Pérez, PhD[1], Luisa Morales, DrPH[2], Vicmag Cabrera, BA[3], Loren A. Meléndez, MS[1].
[1]University of Puerto Rico, Medical Science Campus, San Juan, Puerto Rico,
[2]Ponce Health Science University, Ponce, Puerto Rico,
[3]Universidad Central del Caribe, Bayamón, Puerto Rico

INTRODUCTION: The Hispanic Alliance for Clinical & Translational Research is a collaborative effort among Puerto Rico's three primary health academic universities, aimed at supporting island-wide research endeavors. The Alliance established a Community Health and Research Council to enhance involvement in decision-making processes for research initiatives targeting health disparities. This evaluation examines the evolution of collaboration and participation among Council members.

METHODS: Formative evaluation, utilizing items from the Spanish version of the Community Engagement Survey Engage for Equity, were conducted using REDCap to assess community context, collaboration capacity, community engagement, health outcomes, and members' experiences on a scale from 1=None to 5=A lot. A total of 21 and 18 members were invited to complete the evaluation in Year 1 and Year 3, respectively, with a response rate exceeding 52% each year. Descriptive analyses were performed using SPSS-V29.

RESULTS: There was increased knowledge of the council's structure and function (M from 3.6 to 3.9) and understanding of members' main roles (M from 3.4 to 3.9). Improvements in collaboration quality (M from 4.2 to 4.7) and overall satisfaction (M from 4.2 to 4.7) from Year 1 to Year 3. Higher mean scores showed progress for community context, collaboration capacity, adherence to Community-Based Participatory Research principles, health outcomes, and community-level research and policy outcomes. Council members actively participated in decision-making processes conducive to implementing research activities.

CONCLUSION: This evaluation highlights the Council's growth and impact in knowledge and capacity, along with members' perceptions regarding the Alliance's contributions to health, community-level research, and policy outcomes.

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BREAKING BOUNDARIES: BUILDING A DYNAMIC PBRN FOR TRANSFORMATIVE HEALTHCARE COLLABORATION IN PUERTO RICO

Carlamarie Noboa, MS[1], PhD; Enid J. García, MD[1], MS; Loren A. Meléndez, MS[1], Laura Domenech, MD[2]; Barbara Carlo, BA[1].
[1]University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico;
[2]Ponce Health Sciences University, Ponce, Puerto Rico

INTRODUCTION: Pioneered in the US during the 1980s, Practice-based Research Networks (PBRNs) have revolutionized collaboration between academic researchers and clinicians, driving knowledge translation into communities. In Puerto Rico, the Hispanic Alliance for Clinical and Translational Research launched the island's inaugural PBRN to forge a collaborative nexus among healthcare providers, researchers, and community stakeholders. This presentation unveils diverse perspectives, experiences, and opportunities shaping this groundbreaking collaborative network.

METHODS: Network leaders were strategically chosen, initiating conceptualization and stakeholder outreach for PBRN recruitment. Semi-structured meetings fostered dialogue to discern needs and build trust. A comprehensive research readiness assessment explained participant experiences. Through meticulous strategic planning, the network delineated organizational structure, branding, objectives, resources, processes, and priority activities.

RESULTS: After two years of intensive planning, the PBRN blossomed into the "Generating Research Opportunities Working together (GROW PR Network)" with a robust organizational framework. With over 90 collaborators including FQHCs, hospitals, academic, and nonprofit organizations, the network grew. An AIRe Club emerged as a hub for idea exchange and collaborative project development. Five membership meetings, ongoing site visits, and dissemination efforts continue to promote collaboration among academics, clinicians, and community members.

CONCLUSION: The GROW PR Network heralds a singular opportunity to collectively address community-based healthcare queries and translate research discoveries into practice. Active stakeholder engagement across all phases is imperative for fostering a resilient collaborative network, driving scientific implementation, and nurturing enduring relationships to uplift community health services and outcomes.

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EMPOWERING MUTISECTORAL STAKEHOLDERS: GENERATING RESEARCH OPPORTUNITIES WORKING TOGETHER APPROACH

Carlamarie Noboa, MS, PhD[1]; Enid J. García, MD[1], MS; Loren A. Meléndez, MS[1]; Barbara Carlo Reyes, MS[1]; Laura Domenech, MD[2].
[1]University of Puerto Rico Medical Sciences Campus, San Juan, Puerto Rico,
[2]Ponce Health Sciences University, Ponce, Puerto Rico

INTRODUCTION: Collaborative stakeholders' engagement through networks is pivotal in translating research into evidence-based practices and impact population health. The Generating Research Opportunities Working together for Puerto Rico (GROW PR Network) aims to cultivate a collaborative network of healthcare providers, academic researchers, and community stakeholders to advance scientific knowledge and enhance healthcare services and outcomes. This research presents how GROW PR Network fosters stakeholders' engagement to develop, implement, and disseminate collaborative research initiatives.

METHODS: A semi-structured activity was held using Team-based learning, culturally appropriate approaches, and context analysis. Participants were 24 multisectoral individuals. They collaboratively exchanged research ideas based on their experiences, and community and patients' needs. Four groups were arranged, one-virtually. Three prompts were used to develop a draft with a main research concern, collaborative research to address the concern, and a main topic.

RESULTS: Groups identified healthcare access needs for populations with chronic health conditions, mental health concerns, and within vulnerable communities. One group highlighted the opportunity to research medical literacy among clinicians and patients in rural PR. Collaborative strategies involving multisectoral organizations and enhanced accessibility to medical services emerged. Groups developed their preliminary collaborative research concepts.

CONCLUSION: Team-based learning fosters engagement, partnerships, gap identification, and research involvement. Including evidence-based strategies along with culturally appropriate interventions creates an environment of respect for unique linguistic and social contexts in PR, prioritizing the exchange of ideas, helping to build lasting relationships and generate research opportunities working together for PR.

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