

MATERNAL MENTAL HEALTH AND CARIOGENIC ORGANISMS IN HURRICANE-EXPOSED MOTHER-CHILD DYADS

Rosario-Colón P¹, Hanke-Herrero R¹, López Del Valle L¹, Rivas-Tumanyan S¹, Soto M¹, Martínez-González K², Buxó C¹, Morou-Bermúdez E¹

¹ University of Puerto Rico Medical Sciences Campus – School of Dental Medicine, Advanced Education Program in Pediatric Dentistry

² University of Puerto Rico Medical Sciences Campus – School of Medicine



Introduction

- Hurricane María caused widespread disruption in Puerto Rico, including prolonged loss of electricity, limited access to clean water, food insecurity, and interruption of healthcare services, resulting in significant psychosocial stress.
- Pregnant women were particularly vulnerable, experiencing increased emotional distress and reduced access to prenatal care. Prenatal maternal stress has been shown to influence fetal development and has been associated with alterations in the infant microbiome.
- However, its effect on the oral microbiome remains unclear. Salivary Mutans Streptococci (MS) and yeast are key microorganisms involved in early childhood caries and are known to be transmitted from mother to child.

Objective

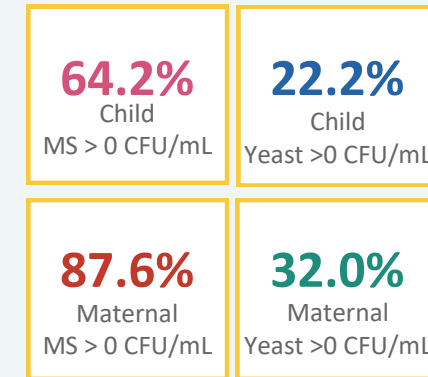
- Assess the association between maternal mental health and salivary MS and yeast levels in mother-child dyads prenatally exposed to Hurricane María in Puerto Rico.

Methodology

- The Hurricane Exposures and Long-Term infant Outcomes Study (HELiOS) cohort includes 187 mother-child dyads prenatally exposed to Hurricane María in Puerto Rico. 122 mother-child dyads with microbiological and mental health data were used for this cross-sectional study.
- Maternal mental health was assessed using validated instruments (PHQ-9, PSS-10, PCL-5). Standardized oral examinations were performed, and saliva samples were collected and cultured in selective media to quantify MS and yeast (CFU/mL).
- Associations were assessed using chi-square or Fisher's exact tests and sequential logistic regression models, adjusting for potential confounders.

Results

Prevalence of Oral Microorganisms



Maternal Mental Health Prevalence

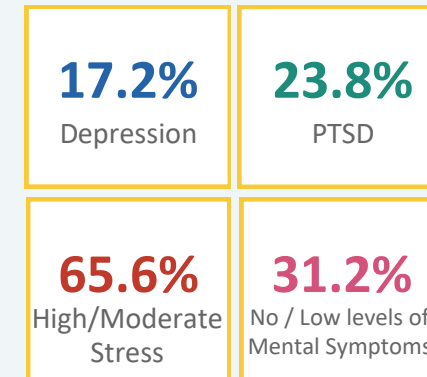
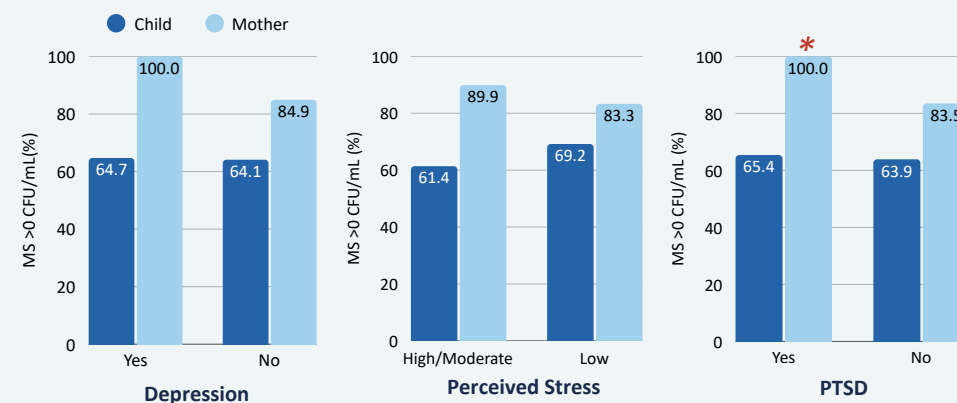


Figure 2. MS Prevalence (> 0 CFU/mL, %) by Maternal Mental Health Group



*PTSD was significantly associated with Mothers' Salivary MS prevalence, Fisher's test p-value = 0.035

Figure 4. Adjusted Odds Ratios (95% Confidence Intervals) for Child Microbiological Outcomes According to Maternal Mental Health Measures.

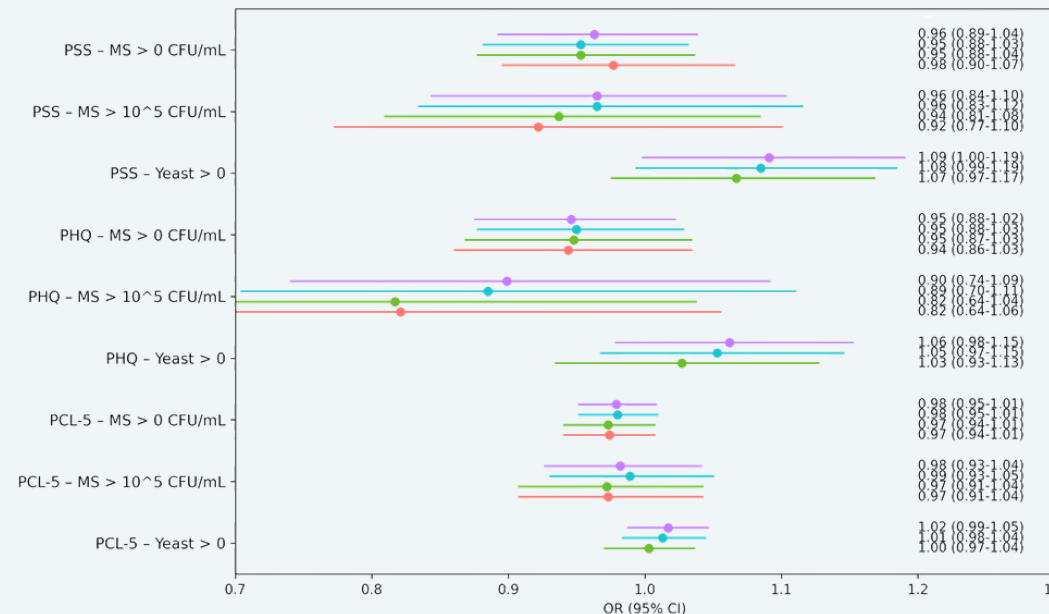
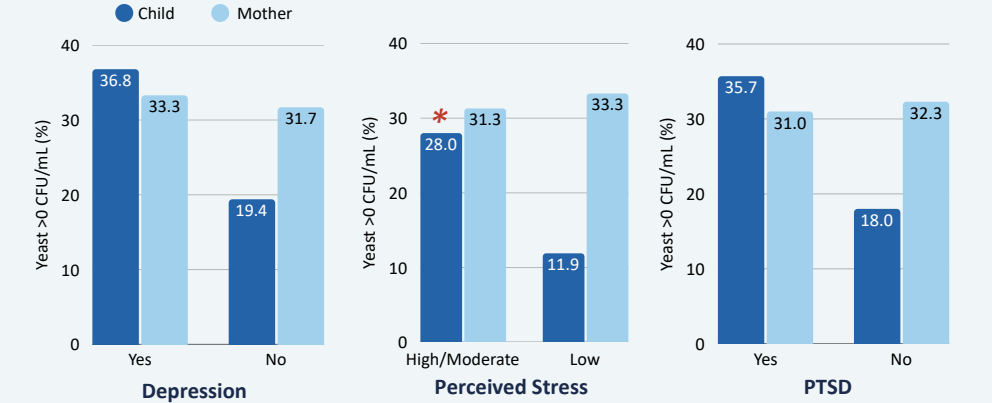


Figure 1. Yeast Prevalence (> 0 CFU/mL, %) by Maternal Mental Health Group



*High / moderate maternal stress was significantly associated with child yeast presence, chi-square p-value=0.045

Figure 3. High (>10⁵ CFU/mL) MS Load Prevalence (%) by Maternal Mental Health Group

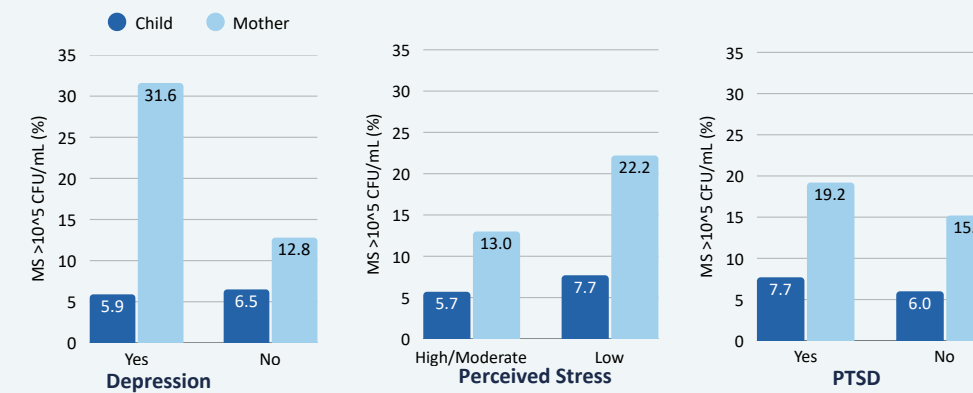
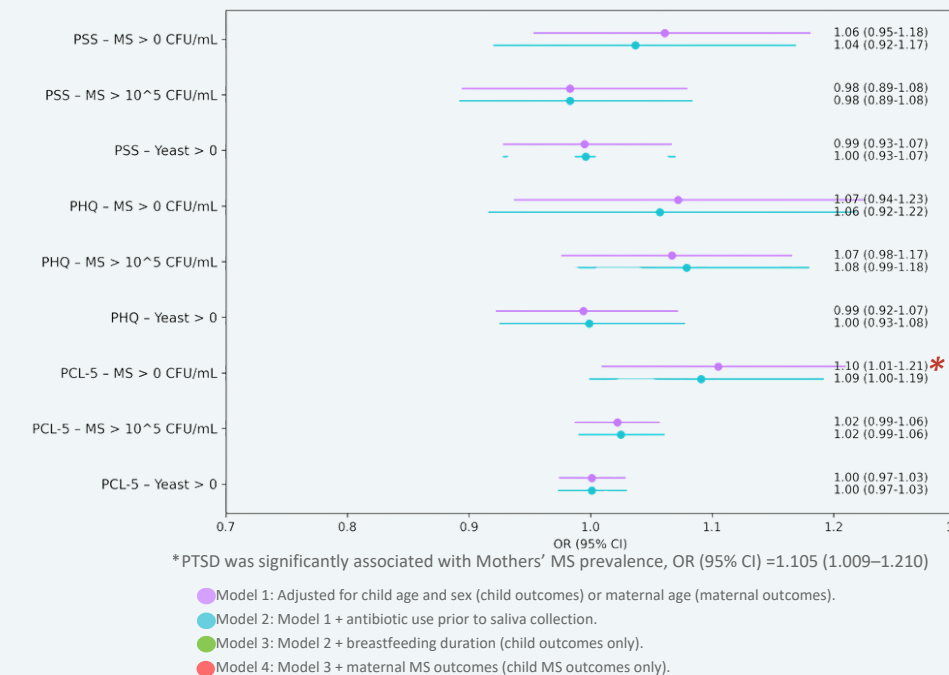


Figure 5. Adjusted Odds Ratios (95% Confidence Intervals) for Maternal Microbiological Outcomes According to Maternal Mental Health Measures.



*PTSD was significantly associated with Mothers' MS prevalence, OR (95% CI) = 1.105 (1.009-1.210)

- Model 1: Adjusted for child age and sex (child outcomes) or maternal age (maternal outcomes).
- Model 2: Model 1 + antibiotic use prior to saliva collection.
- Model 3: Model 2 + breastfeeding duration (child outcomes only).
- Model 4: Model 3 + maternal MS outcomes (child MS outcomes only).

Discussion of Key Findings

- Unadjusted analyses suggested associations between maternal stress and prevalence of yeast in children, and between PTSD and salivary MS presence in mothers. Multivariable-adjusted associations between continuous mental health measures and microbial outcomes were not significant.
- A significant association between maternal PTSD scores and presence of maternal salivary MS was observed in age-adjusted models.
- In HELiOS, hurricane exposures have previously been linked to maternal mental health and epigenetic changes in children.

Conclusion

- Data suggests a possible association between hurricane exposure-associated maternal stress and presence of oral yeast in infants, possibly due to impact on the immune system.
- PTSD may be associated with high salivary MS levels in mothers.
- Future longitudinal studies with larger samples and broader covariate adjustment are needed to clarify these relationships.

References



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