Vaginal Instability And Dysbiosis Is Prevalent Among Hispanic Women Living In Puerto Rico Regardless Of Body Mass Index

Elizabeth Rosalia Tapia, MPH, Comprehensive Cancer Center, Puerto Rico
Josefina Romaguera, MD, MPH, Department of OBGYN, School of Medicine, University of Puerto Rico Medical Sciences Campus (UPRMSC), Puerto Rico
Ana Patricia Ortiz, DrPH, MPH, Department of OBGYN, School of Medicine, UPRMSC, Puerto Rico
Filipa Godoy-Vitorino, Ph.D, Department of Microbiology and Medical Zoology, UPRMSC, Puerto Rico

Abstract

Hispanic women in Puerto Rico have nonoptimal cervicovaginal microbiome compositions, characterized by Community State Type (CST). The composition of cervicovaginal microbiota is influenced by factors such as ethnicity, physiology, and lifestyle. Previous research has shown that obesity is associated with higher vaginal microbiome diversity. Since obesity is a cancer risk factor, we aim to determine if body mass index (BMI) is associated with vaginal microbiome composition (VMB) to understand HPV infection risk and lower genital tract cancers among women in Puerto Rico. In this cross-sectional study, participants were recruited during routine gynecological visits at the University of Puerto Rico Medical Sciences Campus (n=256). Inclusion criteria included: 1) Ages 21-70 years, 2) non-pregnant, and 3) no hysterectomy. Participants received a metadata questionnaire and pelvic exam where cervical swabs were collected. Composition of the cervicovaginal microbiota was characterized through 16S/ITS gene sequencing. HPV infection was genotyped through high resolution SPF10-LiPA25. Among the population, there were no significant associations between BMI and VMB (Fisher's Exact Test, p= .167). There were significant associations between BMI, menopausal status, and previous Bacterial Vaginosis (Pearson's Chi-Squared Test, p= .003; <0.01). Ow/Ob women displayed higher prevalence of CST IV-B compared to normal BMI women. The cervicovaginal microbiome of Hispanic women in Puerto Rico is dominated by *L.iners* or diverse microbial communities, regardless of BMI and HPV status. Overweight and obese women (Ow/Ob) had a higher prevalence of disruptive microbial diversity. Our results indicate that women living in Puerto Rico display high prevalences of unstable vaginal microbial communities, dominated by *L.iners*. However, Ow/Ob women display higher rates of disruptive vaginal microbial diversity. These findings show that Ow/Ob women in Puerto Rico may be more susceptible to vaginal dysbiosis and poor vaginal health outcomes, including HPV and lower genital tract cancers.

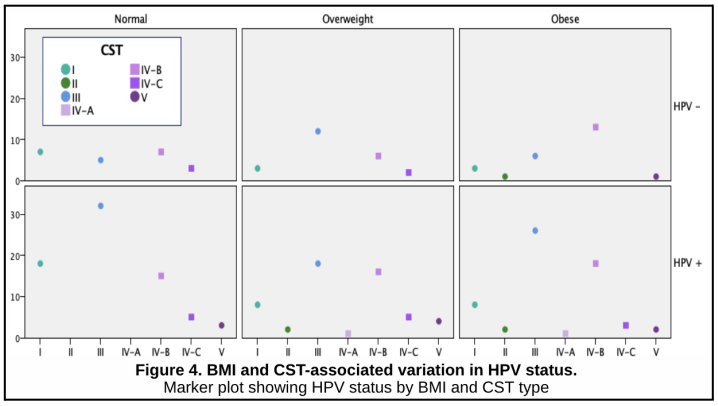


Figure 4. BMI and CST-associated variation in HPV status.
Marker plot showing HPV status by BMI and CST type

Recent Publications

1. Allen, N. G., Edupuganti, L., Edwards, D. J., Jimenez, N. R., Buck, G. A., Jefferson, K. K., Strauss, J. F., Wickham, E. P., & Fettweis, J. M. (2021). The vaginal microbiome in women of reproductive age with healthy weight versus overweight/obesity. *Obesity (Silver Spring)*. https://doi.org/10.1101/2021.03.18.435996
2. Auriemma, R.S., et al., The Vaginal Microbiome: A Long Urogenital Colonization Throughout Woman Life. Front Cell Infect Microbiol, 2021. 11: p. 686167.
3. Garg, A., Ellis, L. B., Love, R. L., Grewal, K., Bowden, S., Bennett, P. R., & Kyrgiou, M. (2023). Vaginal microbiome in obesity and its impact on reproduction. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 102365.
4. Godoy-Vitorino, F., et al.,Cervicovaginal fungi and bacteria associated with cervical intraepithelial neoplasia and high-risk human papillomavirus infections in a hispanic population. Frontiers in microbiology, 2018. 9: p. 2533.
5. Wang X, Huang X, Zhang Y. Involvement of Human Papillomaviruses in Cervical Cancer. Frontiers in Microbiology. 2018 ;9:2896. DOI: 10.3389/fmicb.2018.02896. PMID: 30546351; PMCID: PMC6279876.



Biography

Elizabeth Rosalia Tapia has expertise in reproductive and sexual health research and policy. She recently completed an NIH-funded program at the University of Puerto Rico Comprehensive Cancer Center through the Cancer Prevention and Control Research Training Program (CAPAC). In this study, she worked alongside Dr. Josefina Romaguera to evaluate the role of body mass on the composition of the vaginal microbiome and its potential implications for vaginal infections and disease. This research allows for insight on a population that experiences disproportionately high rates of HPV and cervical cancer. It is also a population that is often excluded from mainland United States' research studies, thus proving the importance of a work of this nature.

Email: elizabethrosalia17@gmail.com