
qPCR-based quantification of *Gardnerella* spp. in vaginal and penile samples: insights into partner dynamics

Julia Gnägi^{*1}, Hanna Marti², Marcel Suleiman¹, Enrique Rayo², Natasha Arora³, and Monica Ticlla Ccenhua⁴

¹Fachhochschule Nordwestschweiz [Windisch, Schweiz] = FHNW University of Applied Sciences and Arts Northwestern Switzerland – Suisse

²Institute of Veterinary Pathology, University of Zurich – Suisse

³Zürich Institute of Forensic Medicine, University of Zürich, Zürich – Suisse

⁴SwissTPH - Swiss Centre for International Health - – Suisse

Résumé

Gardnerella spp. is a natural bacterial component of the vaginal microbiome. However, its overabundance is linked to bacterial vaginosis (BV), a shift in the vaginal microbial environment associated with an increased risk of infertility, perinatal complications and sexually transmitted infections (STI). Although BV is not currently classified as an STI, *Gardnerella* spp. has been detected in the penile anatomy. Reliable detection of *Gardnerella* spp. in vaginal and penile samples is therefore crucial for understanding its potential transmission dynamics, the role of male partners in BV onset and recurrence, and its broader implications for sexual health. We implemented and validated a quantitative polymerase chain reaction (qPCR) assay targeting the *elongation factor Tu* gene of *Gardnerella* spp. We applied this method to 163 vaginal fluid and penile skin samples from 22 heterosexual couples in Switzerland. This is intended to explore potential links between microbial patterns and factors such as partner dynamics, sexual practices, e.g. use of barrier contraceptives, and broader questions around the transmission and classification of *Gardnerella* spp. as a sexually associated pathogen. Our results show low to moderate positive correlations of *Gardnerella* spp. loads between sexual partners samples across three timepoints (Spearman's $\rho = 0.38, 0.76, 0.51$). No association was found between bacterial load and frequency of sexual intercourse. Condom use was linked to significantly lower *Gardnerella* spp. loads in penile skin samples, but not in vaginal fluid. Improved understanding of these patterns may support more effective treatment strategies and reduce stigma surrounding vaginal and sexual health by making this knowledge more accessible to the public.

*Intervenant