

Poster 13

Genomic and phenotypic heterogeneity of *Gardnerella* genus – implications for women’s urogenital health

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Abstract

Background: *Gardnerella* species have been associated with bacterial vaginosis but are also found in asymptomatic women [1]. **Objective:** Characterize *Gardnerella* urogenital isolates from asymptomatic women (HW) and women diagnosed with overactive bladder (OAB), to understand bacterial factors that may influence health outcomes. **Methods:** *Gardnerella* isolates (urine, $n=5$ HW, $n=4$ OAB) were subjected to WGS (Illumina). Virulence determinants searched included vaginolysin, a cytolysin specific to human erythrocytes, and sialidases, crucial in mucosal surface interactions. Antimicrobial resistance genes were predicted using ResFinder. Sialidase activity was confirmed using neuraminic acid fluorogenic substrate. Susceptibility to different antibiotics (benzylpenicillin, meropenem, clindamycin, metronidazole, and erythromycin) was determined by agar dilution method following EUCAST guidelines. **Results:** *G. vaginalis*, *G. pickettii*, *G. leopoldii*, and *G. greenwoodii* were identified. The presence of sialidases was variable among isolates: *nanH2* was not detected, and *nanH3* was detected in 3 isolates. Isolates with *nanH3* displayed sialidase activity, with exception of one isolate, likely due to observed nucleotide sequence alterations. Different types of vaginolysin (*vly*) were detected in 8 isolates: type 1A was detected in *G. vaginalis* and *G. greenwoodii*; type 1B, associated with vaginal symptoms was detected in *G. vaginalis*, *G. pickettii* and *G. greenwoodii*; and type 2, associated with odour and discharge, was identified in *G. leopoldii* (HW and OAB). Genes previously associated with macrolides and lincosamides resistance were predicted *in silico*, but further analysis showed no functional operons or low homology with the reference gene. In general, MICs to the tested antibiotics were low, with exception of c18Ua_112-*G. leopoldii* with metronidazole MIC=8mg/L. **Conclusions:** Our findings underscore the complexity of *Gardnerella*’s role in urogenital health. The majority of low MIC observed support the effectiveness of commonly prescribed antibiotics against *Gardnerella*. Vaginolysin was prevalent, displaying diverse types associated with different clinical manifestations. Further exploration of host-microbe interactions is needed to decipher the mechanisms and clinical implications of these variations.

Keywords: urogenital microbiome; virulence; antimicrobial susceptibility

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References

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