002.4 RELATIONSHIP BETWEEN THREE NOVEL BACTERIAL VAGINOSIS (BV) ASSOCIATED BACTERIA AND NONGONOCOCCAL URETHRITIS IN MEN WHO HAVE SEX WITH WOMEN

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Background Bacterial vaginosis associated bacteria (BVAB) have been detected among cisgender men who have sex with women (MSW) and may be associated with clinical syndromes in men. We evaluated the frequency and correlates of three BVAB in MSW and their association with nongonococcal urethritis (NGU).

Methods MSW without *Neisseria gonorrhoeae* attending an urban STD clinic from 2014–2018 completed a computer-assisted self-interview, clinical interview and examination. NGU was defined as ≥ 5 polymorphonuclear leukocytes/hpf on a urethral Gram stain plus urethral symptoms or visible discharge. Urine specimens were tested for *Chlamydia trachomatis* and *Mycoplasma genitalium* using Aptima (Hologic, Inc.) and for BVAB2, *Mageeibacillus indolicus*, *Sneathia* spp., *Trichomonas vaginalis*, *Ureaplasma urealyticum*, herpes simplex virus, and adenovirus using quantitative PCR (qPCR). A subset of men contributed serial monthly specimens over 6 months.

Results Of 317 MSW ages 17–71, 67 (21.1%) had *Sneathia* spp., 36 (11.4%) had BVAB2, and 17 (5.4%) had *M. indolicus* at enrollment. Co-colonization with >1 BVAB was observed in 50% (36/71). No demographic and few behavioral characteristics were associated with these BVAB; only having multiple partners (≥ 3 past two months) was more common among men with than without these BVAB (BVAB2: 47% vs. 23%, *M. indolicus*: 53% vs. 24%, *Sneathia* spp: 42% vs. 22%, $p \leq 0.03$ for all). *Sneathia* spp. were associated with lower odds of prevalent NGU (adjusted Odds Ratio [aOR]=0.36, 95% CI=0.13–0.97) whereas neither BVAB2 nor *M. indolicus* were associated with prevalent NGU (aOR=0.62; 95% CI=0.15–2.55; aOR=3.12; 95% CI=0.63–15.54). In 34 men with serial samples, persistence was common and not significantly different between BVAB (median persistence for BVAB2=2 months (range=2–6); *M. indolicus*= 4 months (range=3–5); *Sneathia* spp.=3 months (range=2–8); $p \geq 0.20$ for each comparison).

Conclusions BVAB2, *M. indolicus*, and *Sneathia* spp. were frequently detected in MSW attending an STD clinic, but not associated with increased risk of prevalent NGU.

002.5 SECRETED PROTEOLYTIC ACTIVITY OF BACTERIAL VAGINOSIS-ASSOCIATED BACTERIA

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Bacterial vaginosis (BV) is a prevalent dysbiotic vaginal condition associated with increased risk for acquisition/transmission of sexually transmitted infections (STIs). While the microbes present in women with BV are highly variable, functional features such as increased catabolism of peptides/amino acids are relatively conserved. To date, the bacterial proteases initiating this process and identity of host protein targets remain undefined. We hypothesized that broad-acting proteases are secreted by BV-associated bacteria and modulate host factors relevant to STI acquisition.

Bacterial suspensions and cell-free supernatants from select BV-associated species were evaluated for proteolytic activity using the universal protease substrate, casein, in agar plates and fluorometric assays. Degradation of collagen was explored using zymography or fluorophore-conjugated collagen with or without inhibitors. Fibrinogen/thrombin degradation was explored through clot inhibition assays and protein gel electrophoresis.

Our investigations reveal that BV-associated bacteria including *Prevotella amnii*, *Prevotella bivia*, *Porphyromonas asaccharolytica*, *Porphyromonas uenonis*, *Sneathia amnii*, *Sneathia sanguinegens*, *Gardnerella vaginalis*, and *Gardnerella piotti* produce secreted proteases with broad substrate specificity. However, only select species degrade specific host protein polymers, namely collagen. Further investigation of *Porphyromonas* enzymes revealed that metallo- and cysteine proteases coordinate broad activity. Both species secrete three collagenases, which were fully abrogated by metalloprotease inhibitors in *P. uenonis*, but not *P. asaccharolytica*. Finally, both species degrade fibrinogen and thrombin to abrogate blood clotting.

These studies reveal proteolytic activity is conserved among numerous vaginal bacteria with important roles in BV pathogenesis. However, modulation of specific host targets is more variable. Vaginal *Prevotella* and *Porphyromonas* species increase risk of HIV acquisition and our findings show *Porphyromonas* species exhibit proteolytic activities through diverse and redundant enzymes. These activities could induce barrier disruption and microhemorrhage in the cervicovaginal niche, thereby increasing the risk of STI acquisition. Further characterization of secreted proteases and their targets could identify new therapeutics for BV and STIs.

002.6 ASSOCIATIONS BETWEEN VAGINAL BACTERIA AND BACTERIAL VAGINOSIS SIGNS AND SYMPTOMS: A COMPARATIVE STUDY OF KENYAN AND AMERICAN CISGENDER WOMEN

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Background Vaginal colonization with specific bacterial vaginosis (BV)-associated bacteria has been associated with individual BV signs and symptoms (Amsel criteria). Bacterial colonization