Hot Topic

National STD Curriculum Podcast

Is Bacterial Vaginosis (BV) an STI?

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Season 6, Episode 2

This episode reviews four recent BV studies which address the efficacy of treating male partners, women's self-management strategies, and how the vaginal microbiome might impact BV and HIV infection.

Topics:

- Bacterial vaginosis
- BV
- StepUp trial
- STI
- HIV

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Disclosures

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References

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Transcript

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intro-background**[00:00] Intro and Background**

Hello everyone. My name is Meena Ramchandani. I'm an infectious disease physician at the University of Washington in Seattle. This podcast is dedicated to an STI [sexually transmitted infection] literature review for health care professionals who are interested in remaining up to date on the diagnosis, management, and prevention of STIs.

An article was published in the *New England Journal of Medicine* in March of 2025 that might change how we think about BV \(or bacterial vaginosis\), and I thought it would be important to review in this episode. So, let's start out with a bit of background. What is BV? It's when there is an alteration in the vaginal flora with an increase in anaerobic bacteria and a reduction in the *Lactobacillus* species. The *Lactobacillus* species typically provide a healthy vaginal environment, and patients might present with thin white or grey vaginal discharge, a strong odor, or dysuria \(or burning with urination\). And, women with BV are at increased risk for STI acquisition, as well as other adverse health consequences, such as potential pregnancy complications. We don't know the cause of BV, but it's one of the most common vaginal conditions in reproductive-age women. It can be treated with antibiotics, but recurrences are common and can be up to 60 to 80% of women with ongoing partners. Now, historically, BV is not considered a traditional STI, but there is some data which may support sexual transmission of BV-associated bacteria. So, let's talk about what's been recently published in the literature on this topic.

paper-1**[01:38] Paper #1**

Vodstrcil LA, Plummer EL, Fairley CK, et al. Male-partner treatment to prevent recurrence of bacterial vaginosis. N Engl J Med. 2025 Mar 6;392\(10\):947-957. **[PubMed Abstract]**

This first article for review was published in the *New England Journal of Medicine* in March of 2025 by Dr. Vodstrcil and colleagues. It is titled "Male-partner treatment to prevent recurrence of bacterial vaginosis." I'm going to spend a bit more time on this study.

So, past trials of male partner treatment for patients with BV did not show it prevented recurrence in those women, but male partners were treated with oral antibiotics alone in those studies, and the studies had several limitations.

So, in this randomized controlled trial, which was also called StepUp, the authors evaluated whether oral and topical antimicrobial treatment of male partners of women with BV reduced the risk of recurrence of BV in those women at 12 weeks. From 2019 to 2023, 164 couples, consisting of a male and female partner, were enrolled in two sexual health services and three family planning clinics in Australia. Couples needed to be in a monogamous relationship and were randomly assigned to partner treatment group or the control group, and they had about 80 couples in each group. Most women, about 87%, had a history of BV, 80% had an uncircumcised male partner, and about 30% used an IUD [*intrauterine device]*. These are some of the possible risk factors associated with BV in past studies.

In both groups, partner treatment group as well as the control group, the female partner was treated with first-line antibiotics for BV in Australia, and this included metronidazole 400 mg orally twice a day for 7 days. Now, if metronidazole was contraindicated, women received either an intravaginal 2% clindamycin cream for 7 nights or intravaginal 0.75% metronidazole gel for 5 nights. These treatments are also recommended for BV per U.S. guidelines, except our metronidazole pills come in 500 mg dosages as opposed to the 400 mg dosage that they used in Australia. In the partner treatment group, men also received metronidazole 400 mg orally twice a day for 7 days, and they applied 2% clindamycin cream to the penile skin twice daily for 7 days. In the control group, men did not receive any treatment.

What the authors found is that recurrence of BV within 12 weeks was observed in 35% of women in the partner treatment group and in 63% of women in the control group. The mean time until recurrence was around 74 days in the partner treatment group and around 55 days in the control group. The authors did not find results differed substantially according to IUD use or circumcision status, and they found recurrence was

not associated with contraceptive use or sexual practices.

In this study, there was an absolute risk difference of -2.6 recurrences per person-year among women in the partner-treatment group than among women in the control group over 12 weeks. The trial was stopped early at the interim analysis because of a significant difference between these two groups. This study provides important evidence of sexual transmission of BV-associated bacteria that are likely present on the penile skin or the urethra. And, the results from this study have the potential to change the way we think about treating partners for this diagnosis, as well as allow for more education of patients in ways to potentially reduce recurrence, at least for some patients. There's a great editorial that was written by Dr. Muzny in the same issue of the *New England Journal of Medicine* that I would encourage you to read if you're interested in learning more about this topic.

paper-2**[05:14] Paper #2**

Davis A, Sun YY, Chitnis J, et al. Examining women's self-management strategies for recurrent bacterial vaginosis in New York City. Sex Transm Dis. 2025 Jul 1;52\(7\):428-435. **[PubMed Abstract]**

Along the lines of education around BV, the next article I'd like to briefly review was published in *Sexually Transmitted Diseases* in July of 2025 by Dr. David and colleagues. It is titled "Examining women's self-management strategies for recurrent bacterial vaginosis in New York City."

They interviewed 41 women who had a diagnosis of BV at one of the sexual health clinics in New York City in the last year. They found that women identified certain risk factors they felt were associated with a BV diagnosis and symptoms. These included sex with regular, new, and multiple partners; partner infidelity, and condomless sex. Many women attributed BV to partner factors, and several expressed frustration that providers informed them BV was not sexually transmitted, despite the women's experience that the onset or recurrence of BV seemed to be related to their partner.

Nonsexual triggers of BV were also identified by women, and these included diet, perfumed soaps and hygiene products, underwear choices, and incomplete medication adherence to BV treatment because metronidazole treatment is given for 7 days. Women with frequent BV recurrence reported making lifestyle changes to try to prevent recurrence, and these included a variety of dietary changes, switching to unscented hygiene products, or even changing sexual behaviors, such as using condoms more frequently or abstaining from sex.

So, this article was helpful to understand the types of triggers women perceive initiated an episode of BV and strategies they might use to reduce recurrence. It's interesting that women identified sex as a risk factor for BV, and may reflect some of the data we reviewed in the first article.

paper-3**[06:58] Paper #3**

Keller MJ, Wang T, Murphy K, et al. Cervicovaginal secretions in young women with bacterial vaginosis enhance HIV infection. J Infect Dis. 2025 Dec 20;232\(6\):1436-1445. **[PubMed Abstract]**

BV is associated with some potential adverse effects in women, and these include increased risk of other infections, such as HIV and HSV [herpes simplex virus], but the mechanisms are not well understood. An article was published in December of 2025 by Dr. Keller and colleagues in *The Journal of Infectious Diseases* that explored the underlying mechanisms for increased risk of HIV acquisition and transmission in the setting of BV. It is titled "Cervicovaginal secretions in young women with bacterial vaginosis enhance HIV infection."

They enrolled 19 women with a clinical diagnosis of BV, treated with either oral or intravaginal metronidazole, and compared these women to 13 controls who were without BV. Vaginal swabs and cervicovaginal lavage

were obtained at enrollment, 2 weeks, and 4 weeks after treatment.

The authors found that more participants with BV \(or 15 women\) had a vaginal community-state type of IV at the initial visit \(this is also known as a CST IV\), which is an anaerobic-dominant microbiome. This was in contrast to controls, which primarily had a *Lactobacillus*-dominant vaginal microbiome. *Lactobacillus* species help to provide a healthy and protective vaginal microbiome.

After treatment, despite clinical improvement, the authors found that 10 of the women with BV retained a CST IV 2 weeks later. And, at 4 weeks after treatment, 11 of the women with BV at enrollment had a CST IV. And, so, this indicates that despite metronidazole treatment and despite clinical improvement, these women continued to have an anaerobic-dominant vaginal microbiome.

When measuring the effects of cervicovaginal lavage on HIV infection of target cells, the authors found cervicovaginal lavage from controls inhibited HIV infection around 30% compared with control buffer. In contrast, cervicovaginal lavage from women with BV increased HIV infection of cells. With treatment of BV, there was a transient reduction in HIV infection enhancement at 2 weeks posttreatment, but then it rebounded at 4 weeks posttreatment, meaning that at 4 weeks posttreatment, the cervicovaginal lavage of women with BV continued to increase HIV infection of cells compared to control buffer.

The authors also looked at the effects of cervicovaginal lavage from women with BV on HSV infection and *E. coli*growth, and they found it followed similar patterns. For example, at enrollment, cervicovaginal lavage from women with BV had less anti-HSV activity than controls, with cervicovaginal lavage from some women enhancing HSV viral infection. Cervicovaginal lavage obtained from participants with a CST IV microbiome—so one that is anaerobic dominant—enhanced HIV infection to a greater extent than those with a cervicovaginal lavage with a CST I microbiome, which is *Lactobacillus* dominant.

HIV infection enhancement correlated positively with markers of vaginal dysbiosis, some mucosal immune mediators, such as Interleukin-1 alpha, and a greater abundance of certain bacteria such as *Prevotella* species—I might mispronounce these, but I'm going to do my best—*Dialister micraerophilus* and *Peptoniphilus lacrimus*.

This manuscript found cervicovaginal lavage in women with BV-enhanced HIV infection, and this enhancement correlated most strongly with an anaerobic-dominant vaginal microbiome. Most women with a clinical diagnosis of BV had an anaerobic-dominant vaginal microbiome at enrollment, but some actually retained the vaginal dysbiosis despite treatment and clinical improvement at follow-up a few weeks later. And, so, I'd be curious to hear further studies in this area about why this might occur.

paper-4**[10:55] Paper #4**

George SD, Amerson-Brown MH, Sousa LGV, et al. Investigating bacterial vaginosis pathogenesis using peptide nucleic acid-fluorescence in situ hybridization with a focus on the roles of *Gardnerella Species, Prevotella bivia*, and *Fannyhessea vaginae*. Open Forum Infect Dis. 2025 Sep 3;12\(9\):ofaf556. **[PubMed Abstract]**

The next article to review that may help us to understand the cause of BV was published in *Open Forum Infectious Diseases* in September of 2025 by Dr. George and colleagues. It is titled "Investigating bacterial vaginosis pathogenesis using peptide nucleic acid fluorescence in situ hybridization with a focus on the roles of *Gardnerella Species, Prevotella bivia*, and *Fannyhessea vaginae.*" I think that's how you pronounce it.

Previous data from this group demonstrated that the abundance of *Prevotella bivia* and *Gardnerella vaginalis* increased significantly in women just a few days prior to their episode of BV compared to healthy controls. They also had found that *Fannyhessea vaginae*—again, I think that's how you pronounce it, but I apologize if that's wrong—increased on the day BV was diagnosed. The group wanted to further explore the roles of these

bacteria in BV biofilm development, and so they used a peptide nucleic acid fluorescence in situ hybridization \(that's also known as PNA-FISH\) to fluorescently visualize and quantify the bacteria in vaginal specimens. They enrolled 18 cases with BV and then matched them to 18 controls.

The pooled median counts of *Gardnerella species* in BV cases were over 10-fold higher than those seen in controls. And the median counts of these bacteria became significantly greater than controls starting 5 days before the BV diagnosis and through 3 days after the diagnosis. The pooled median counts of *Fannyhessea vaginae* were also higher in cases compared to controls, and the median counts of these bacteria became significantly higher in cases compared to controls on the day of BV diagnosis and then remained higher through 3 days after diagnosis. In contrast, pooled median *Prevotella bivia* counts were consistently low across all days and was 0 on the day of BV diagnosis.

So, this study helped to investigate bacterial colonization over time preceding an episode of BV in women to better understand the polymicrobial communities of BV-associated bacteria. The authors found that there is a significant increase in the quantity of *Gardnerella species* starting about 5 days before BV diagnosis and *Fannyhessea vaginae* on the day of BV diagnosis, which might help to understand which bacteria are involved in the BV biofilm formation.

summary**[13:25] Summary**

To conclude, I'd like to summarize some key points for this session:

1. Adding oral and topical antimicrobial therapy for male partners in addition to treating female partners for BV resulted in a much lower recurrence rate of BV than treating women alone.
2. Women identify sexual and nonsexual risk factors for the onset of BV and use self-management strategies to help reduce the risk of recurrence.
3. Women with BV are more likely to have a CST IV vaginal microbiome, which is anaerobic dominant, and this microbiome may persist even despite treatment.
4. Cervicovaginal lavage obtained from participants with a CST IV microbiome enhanced HIV infection to a greater extent than those with a CST I microbiome, which is *Lactobacillus* dominant.
5. There was an increase in the quantity of *Gardnerella* species starting 5 days before BV diagnosis and *Fannyhessea vaginae* on the day of BV diagnosis that might play a significant role in BV biofilm development.

credits**[14:32] Credits**

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