



BACTERIAL VAGINOSIS: A REVIEW ON RISK FACTORS ,DIAGNOSIS AND TREATMENT

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ABSTRACT

Bacterial vaginosis (BV) is an ecological imbalance of the vaginal microbiota affecting mostly women of reproductive age group. Bacterial vaginosis recurrence is common, and easily treated, but even after cure can quickly recur. This review details some of risk factors, diagnosis, and treatment. Bacterial vaginosis increases the risk for acquiring sexually transmitted infections, including human immunodeficiency virus.

KEYWORDS : BV, PROM, H₂O₂, POC

INTRODUCTION:

Vaginitis is an inflammation of the vagina, usually characterized by any of the following: vaginal discharge containing many white blood cells (WBCs), vulvar itching, vulvar irritation, vaginal odor, vaginal erythema, dyspareunia, and dysuria [1, 2]. The three most common and important causes of vulvovaginitis are bacterial vaginosis (BV), being the most prevalent one, followed by candidiasis and trichomoniasis [3]. BV is a common vaginal infection that occurs mostly in women of child-bearing age or reproductive age [4]. BV has been associated with an increased risk of acquiring sexually transmitted infections (STIs), including human immunodeficiency virus (HIV), gonorrhea, chlamydia, and herpes simplex virus. BV can also lead to pelvic inflammatory disease, preterm birth, and posthysterectomy and postpartum vaginal infections.(5) BV is a clinical condition characterized by a thin, gray/offwhite, homogenous, malodorous adherent vaginal discharge which is more noticeable after intercourse and menses, having pH > 4.5. Fishy odor is noticed on addition of 10% potassium hydroxide to the vaginal fluid (whiff test), and the presence of clue cells, a few or no lactobacilli, and small number (<1/hpf) of polymorphonuclear leucocytes (PMNs) are also the characteristic features of BV [6]. Many cases of BV remain asymptomatic or present with only malodorous vaginal discharge with no inflammatory complaints [7]; thus BV is therefore referred to as "vaginosis" and not "vaginitis" [8]. Lactic acid produced by the normal flora, *Lactobacillus* through hydrogen peroxide (H₂O₂) production, is attributed to the acidimilieu of the vagina. This provides a local defense mechanism by inhibiting the growth of other organisms. Change in the normal vaginal flora causes change in pH simultaneously, which allows a variety of anaerobes and facultative bacteria to overgrow and cause chronic infection as well as abnormal vaginal discharge [6, 9]. Lactobacilli also produce antimicrobial substances like lactic acid, H₂O₂, and bacteriocin to promote a healthy ecosystem in the vagina thereby suppressing the growth of pathogens [9, 10].

DIAGNOSIS:

BV results from an alteration of the vaginal flora. A number of etiologic organisms have been identified, including *Gardnerella vaginalis*, *Mobiluncus* spp, *Prevotella* spp, *Mycoplasma hominis*, *Bacteroides* spp, and BV-associated bacteria (BVAB) 1, 2, and 3.(11) Risk factors for developing BV include sexual activity, particularly unprotected intercourse, an increased number of sexual partners, and women who have sex with women.

It is known that in BV the typical predominance of hydrogen peroxide and lactic acid producing *Lactobacillus*, which helps to keep the vaginal pH < 4.5 is disrupted, allowing for the growth and proliferation of the anaerobic microbes mentioned above. This shift in flora results in bacterial overgrowth leading to the common symptoms of vaginal

discharge and vaginal odor experienced by patients.(13)

The first bacterium discovered which represented BV infection was *G. vaginalis*, and it is still considered the primary pathogen associated with this diagnosis. In 1983, Amsel(14) proposed clinical diagnostic criteria for BV that was previously known as nonspecific vaginitis as identified by Gardner and Dukes in 1955.(12)

The diagnosis of BV can be made clinically if the patient meets 3 of the 4 following criteria: (1) presence of a homogenous, thin, grayish-white discharge; (2) vaginal pH > 4.5; (3) positive whiff test (amine odor with application of 10% potassium hydroxide to sample); and (4) clue cells (vaginal epithelial cells with a speckled appearance due to being coated with bacteria) on visualization using wet mount microscopy.(15)

Nugent scoring is also a reliable method of diagnosis commonly used in research studies but is not often seen in clinical practice because it requires Gram staining of the sample. The Nugent score assesses the quantity of the expected *Lactobacillus* organisms usually present in the vaginal flora in relation to the quantity of other organisms, such as *G vaginalis* and *Mobiluncus* spp, that are associated with BV. The sample is scored on a 0 to 10 scale. Scores that fall in the normal range (0-3) indicate there is an adequate presence of *Lactobacillus* with the absence of *G vaginalis* and *Mobiluncus* spp morphotypes. The intermediate range (4-6) represents a decrease in *Lactobacillus* concentrations but also with the presence of *G vaginalis* and *Mobiluncus* spp. Scores in the highest range (7-10) demonstrate the absence of *Lactobacillus* and the presence of large amounts of *G vaginalis* and *Mobiluncus*.(12)

In clinical settings in which microscopy is not available, detection of *G vaginalis* DNA using the Affirm VPIII test (Becton, Dickinson and Company, Franklin Lakes, NJ) can be used to help support a diagnosis of BV, particularly in patients with odorous vaginal discharge and an elevated vaginal pH.(12) The OSOM BVBlue (Sekisui Diagnostics, LLC, Lexington, MA) can also be used as a point-of-care(POC) test for BV diagnosis because results are available within 10 minutes. This test detects the presence of increased sialidase enzyme activity. Sialidase is an enzyme that is frequently produced by BV-associated bacteria that enhances the pathogenicity of organisms by allowing for easier invasion and destruction of tissues. Its presence indicates the existence of a BV-related bacteria.(12)

Vaginal culture is not useful for diagnosing BV, because many of the microorganisms associated with the condition are not amenable to culture and because colonization of the vagina with various organisms may make culture results difficult to interpret.(16) It is important to note that although *G vaginalis* is the primary bacteria associated with BV, its presence does

not always indicate an infection, because this bacterium has also been found in the vaginal flora of healthy individuals without BV and may be present in as many as 55% women who do not have BV.[11,12]

Treatment:

regimens for BV use metronidazole or clindamycin, either orally or as vaginal creams. The cure rate with oral therapy after a seven-day course has been 84-96% and 94% respectively for metronidazole and clindamycin.[17] The cure rates with vaginal gels have been reported to be 75% and 86% respectively.[18] Oral therapies with both agents have shown reduced pregnancy-associated morbidity while topical therapies have not.[19,20] However, both modes of therapy are effective in non-pregnant women.[21] The conventional treatment of BV in our hospital has been the usage of oral Treatment regimens for BV use metronidazole or clindamycin, either orally or as vaginal creams. The cure rate with oral therapy after a seven-day course has been 84-96% and 94% respectively for metronidazole and clindamycin.[17] The cure rates with vaginal gels have been reported to be 75% and 86% respectively.[18] Oral therapies with both agents have shown reduced pregnancy-associated morbidity while topical therapies have not.[19,20] However, both modes of therapy are effective in non-pregnant women.[21]

However, in view of an increased frequency of recurrent vaginal discharge in patients treated for bacterial vaginosis, we attempted to detect antibiotic resistance among strains of *G. vaginalis* as the probable cause. Recurrent infections might be due to the survival of metronidazole or clindamycin resistant bacteria in the vagina. However, it is reported that less than one percent of the cultivable vaginal anaerobic bacteria are resistant to metronidazole.[22] The interest in BV has increased lately due to the evidence on adverse sequelae to this disorder, such as amniotic fluid infection, clinical chorioamnionitis, premature rupture of membranes (PROM), preterm delivery, low birth weight and postpartum endometritis.[23] Non-pregnant women with BV have been reported to get post-abortion pelvic inflammatory disease,[24] post-hysterectomy vaginal cuff cellulitis and plasma cell endometritis.[23] Several studies have also reported an altered vaginal microflora being linked to an increased susceptibility to the acquisition of HIV and other sexually transmitted infectious agents such as *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. [25] However, increase in rates of syphilis or *Trichomonas vaginalis* have not been reported with BV.

CONCLUSION:

Bacterial vaginosis is a common vaginal imbalance. Some factors, especially vaginal douching, smoke and sexually active women may increase the risk of BV. *Lactobacillus* spp. were the predominant isolates found in the vaginal sample followed by a number of Enterobacteriaceae members and Gram positive bacteria. Many developments are still needed for diagnosis and treatment.

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