



## Original Research Article

# Study of Association of Non-Specific Vaginitis and HIV in Women Patients Attending a Tertiary Care Hospital

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## ABSTRACT

### Keywords

Acquired immune deficiency syndrome, Bacterial Vaginosis, Human Immunodeficiency Virus, Sexually transmitted diseases

For many, many years, and in fact still in many areas bacterial vaginosis is really known as non-specific vaginitis. Several studies have linked BV to an increased risk of acquisition of sexually transmitted diseases (STDs) and human immunodeficiency virus (HIV)/acquired immune deficiency syndrome as well as a number of gynaecological complications. In particular, it is important to know whether vaginal flora changes may enhance HIV acquisition as suggested, and to unravel some of the factors that influence such changes, as these could be perhaps modified. The present observational and prospective study was conducted in the Microbiology department at a Tertiary care Hospital, situated in India. Two hundred and fifty women of reproductive age group (15 – 45 years) formed the study population. Amsel's Clinical criteria and Nugent's microbiological criteria for diagnosis of BV were used. Total Prevalence of Vaginitis in HIV Positive women was 6.4 % (16/250). Out of this, prevalence in HIV Positive women with BV was 4% (10/250), with *Candida* vaginitis prevalence was 2.4% (6/250) and, with *Trichomonas vaginitis* prevalence was 0%. 0.8 % (2/250) HIV Positive women showed normal vaginal flora i.e. no vaginitis. BV is one of the most frequent conditions encountered in sexually transmitted diseases (STD), genitourinary medicine (GUM) or other reproductive health clinics throughout the world. Vaginal flora changes may enhance HIV acquisition. Lactobacilli dominated vaginal ecology may be an important defense against pathogen acquisition. Women with bacterial vaginosis are more likely than women with normal vaginal flora to acquire infection due to HIV.

## Introduction

For many, many years, and in fact still in many areas bacterial vaginosis is really known as non-specific vaginitis, but this is not the case and we are dealing with a very specific entity which has very significant implications for the health of young women.

There has been this chronology where it was first related to be non-specific, we have seen the name change many times through *Haemophilus*, *Gardnerella*, but what has finally been settled on now for the last 15-20 years is that this entity should be called

bacterial vaginosis. The term “Bacterial Vaginosis” was introduced to describe increased vaginal discharge without signs of vulvovaginal inflammation and a noticeable absence of leukocytes. It is hypothesized that anaerobes produce succinic acid, which inhibits white blood cell migration (Holmes, K. K et al., 1981). Bacterial Vaginosis is a condition of bacterial overgrowth in the vagina. The number of facultative and anaerobic bacteria in the vagina of patients with BV is 100 to 1000 times higher than the number in patients whose flora is dominated by lactobacilli. In addition, *Prevotella* and *Porphyromonas* species are especially virulent, and these species are present in particularly high concentrations in patients with BV (Eschenbach DA et al., 1988). It is a syndrome in which the vaginal flora is no longer dominated by lactobacilli and there is an over growth of *Gardnerella vaginalis* (Gram variable coccobacillus), *Mobiluncus* species, *Mycoplasma hominis*, *Peptostreptococcus* species and certain Anaerobic bacteria (Hillier SL et al., 1993, Spiegel CA et al., 1998). Bacterial vaginosis is the commonest cause of vaginal discharge occurring in women attending gynaecological clinics in our country (Saharan SP et al., 1993). It is the most common cause of vaginal discharge among women in reproductive age (Cherpes TL et al., 2003). Patients often present with a malodorous vaginal discharge although many are asymptomatic. BV is one of the most frequent conditions encountered in sexually transmitted diseases (STD), genitourinary medicine (GUM) or other reproductive health clinics throughout the world. BV has been strongly associated with poor pregnancy outcomes such as preterm delivery of low-birth-weight infants (Hillier SL et al., 1995) and several studies have now established associations between BV and HIV (Sewankambo N et al., 1997, Taha TE et al., 1998, Schmid G et al., 2000). In

particular, it is important to know whether vaginal flora changes may enhance HIV acquisition as suggested (Schmid G et al., 2000), and to unravel some of the factors that influence such changes, as these could be perhaps modified. Behavioral factors such as vaginal douching or menstrual hygiene practices have been suggested as important factors that might influence vaginal flora composition (Martino JL et al., 2002). Lactobacilli dominated vaginal ecology may be an important defense against pathogen acquisition as various studies have shown that women with bacterial vaginosis are more likely than women with normal vaginal flora to acquire infection due to herpes simplex virus type-2 (HSV-2), *Trichomonas vaginalis* (Martin HL et al., 1999), *Neisseria gonorrhoeae* (Martin HL et al., 1999) and HIV (Sewankambo N et al., 1997, Martin HL et al., 1999). Both trichomoniasis and bacterial vaginosis have been linked to an increased risk of transmission of human immunodeficiency virus (HIV) and other sexually transmitted diseases (Jones F R et al., 2007). Several studies have linked BV to an increased risk of acquisition of sexually transmitted diseases (STDs) and human immuno-deficiency virus (HIV)/acquired immune deficiency syndrome (Sewankambo N et al., 1997, Lin L et al., 1999, Moodley P et al., 2002), as well as a number of gynaecological complications (Faro S et al., 1993, Peipert JF et al., 1997, McGregor JA et al., 1993, Chaim W et al., 1997, Hillier SL et al., 1995, Watts DH et al., 1990). In particular, it is important to know whether vaginal flora changes may enhance HIV acquisition as suggested (Schmid G et al., 2000), and to unravel some of the factors that influence such changes, as these could be perhaps modified. Behavioral factors such as vaginal douching or menstrual hygiene practices have been suggested as important factors that might influence

vaginal flora composition(Martino JL et al., 2002).Lactobacilli dominated vaginal ecology may be an important defense against pathogen acquisition as various studies have shown that women with bacterial vaginosis are more likely than women with normal vaginal flora to acquire infection due to herpes simplex virus type-2 (HSV-2), *Trichomonas vaginalis* (Martin H L et al., 1999) *Neisseria gonorrhoeae* (Martin HL et al., 1999) and HIV (Sewankambo N et al., 1997, Martin HL et al., 1999). Objective of our study was to find out the association of Bacterial vaginitis and HIV infection.

### **Materials and Methods**

The present observational and prospective study was conducted in the Microbiology department at a Tertiary care Hospital, situated in India. Study protocol was reviewed and approved by institutional review board and each subject gave verbal consent. Two hundred and fifty women of reproductive age group(15 – 45 years) who (for antenatal care or for any other complaint) attended Gynaecology and Obstetric OPD/IPD at tertiary care hospitals formed the study population. Amsel's Clinical criteria and Nugent's microbiological criteria for diagnosis of BV were used(Nugent RP et al., 1991). Age, pregnancy status, parity, ethnicity, mode of contraception, number of sexual partners, presence or absence of symptoms, and a sexually transmitted diseases history were recorded.HIV status of each patient was noted with written informed consent. Women were excluded from the study if they had received systemic antibiotic therapy or local vaginal antimicrobial therapy within the preceding 2 weeks, were menstruating at the time of the examination, cervical cerclage, vaginal bleeding, placenta previa, spermicide use, recent douching, or sexual intercourse within 24 hours.

### **Results and Discussion**

In our study, as shown in Table 1, total Prevalence of Vaginitis in HIV Positive women was 6.4 %(16/250).Out of this, prevalence in HIV Positive women with BV was 4% (10/250), with *Candida* vaginitis prevalence was 2.4% (6/250) and, with *Trichomonas vaginalis* prevalence was 0%. 0.8 %(2/250) HIV Positive women showed normal vaginal flora i.e. no vaginitis. An association between BV and HIV has been reported in several studies (Sewankambo N et al., 1997, Royce RA et al., 1999, Lin L et al.,1999), possibly influenced by vaginal hygiene practices(Martino JL et al., 2002, La Ruche G et al., 1999, Gresenguet G et al., 1997). However, as in study by Edward Demba et al (Edward Demba et al.,2005), not all studies reporting on douching, BV and HIV have found associations between these factors(Fonck K et al., 2001). The relationship between HIV, risk for BV or other STIs is complex, and could be contributed to by high risk sexual behaviour. The study of Edward Demba et al (Edward Demba et al., 2005) was one of the first to report on female genital cutting in relation to HIV and vaginal flora in Africa. And they did not find any significant impact of this female circumcision on the vaginal flora or HIV serostatus.

In the present study the total prevalence of Vaginitis in HIV Positive women was 89 %(16/18). Table 2 shows the prevalence of BV as 55.5% (10/18) in HIV Positive women as compared to that of *Candida* vaginitis which was 33% ( 6/18) and *Trichomonas vaginalis* which was 0% (0/18). Warren D et al(Warren D et al., 1996) reported that one-third to one-half of HIV positive women have bacterial vaginosis. They reported three-quarters of women with bacterial vaginosis have no symptoms. In Edward Demba et al's study, HIV

prevalence was 12.8%. Overall, in their study, there was no association between BV and HIV, and among the microorganisms associated with BV, only *Bacteroides* spp. and *Prevotella* spp. were associated with HIV (Edward Demba et al., 2005).

In our study, as shown in Table 3, in HIV Positive women, clinically symptomatic vaginitis cases were 44.4% (8/18) and asymptomatic vaginitis cases were 55.6% (10/18). On Gram /Giemsa staining and after applying Nugent’s criteria, no vaginitis was observed in 11.11% (2/18) HIV positive women though clinically they were symptomatic. Further in HIV Positive women 16.6% (3/18) showed symptomatic BV and 39% (7/18) showed asymptomatic BV. There were 16.6%(3/18)symptomatic *Candida* vaginitis and 16.6%(3/18) asymptomatic *Candida* vaginitis in HIV positive women. We found no cases with *Trichomonas vaginitis* in HIV Positive women In a study carried out by Munjoma et al,( Munjoma et al., 2004) the prevalence of BV was 29% by Amsel criteria, 34% by Nugent criteria and 49% by the simple lactobacillus method. The sensitivity and

specificity of the simple method using Amsel as the gold standard was 83% and 65% respectively with a kappa value of 0.40. The sensitivity and specificity of the simple test using Nugent as the gold standard was 86% and 82% respectively with a kappa value of 0.68. Sensitivities and specificities of individual Amsel criteria including lactobacillus for determining bacterial vaginosis with Amsel as the gold standard were as follows; discharge 15% and 99%, whiff 96% and 85%, clue cells 96% and 75%, pH 99% and 22% and lactobacillus 83% and 65%. Using Nugent as the gold standard the respective sensitivities and specificities were as follows; discharge 08% and 99%, whiff 70% and 87%, clue cells 67% and 73%, pH 92% 22% and lactobacilli 86% and 82%. The HIV-1 prevalence in the BV study sample (n=392) was about 46%. According to Amsel criteria only 26% of the HIV positive participants had BV while according to the lactobacilli method 59% of the HIV positive participants did not have lactobacillus as part of the normal flora of the lower female genital tract.

**Table.1** Observations on the Basis of Gram/Giemsa Staining of the Vaginal Smear Done in HIV Positive Women Selected for Study

Total number of HIV positive cases out of 250 women → 18 (7.2 %).									
Total number of HIV positive cases out of 250 women with <u>normal vaginal flora (i.e. No Vaginitis )</u> → 2(0.8%)									
Total cases of vaginitis in HIV positive women (Out of 250)		Intermediate Bacterial vaginosis (Out of 250)		Definite Bacterial vaginosis (Out of 250)		Candida vaginitis (Out of 250)		richomonas Vaginitis (Out of 250)	
No	%	No	%	No	%	No	%	No	%
16	6.4	4	1.6	6	2.4	6	2.4	0	0

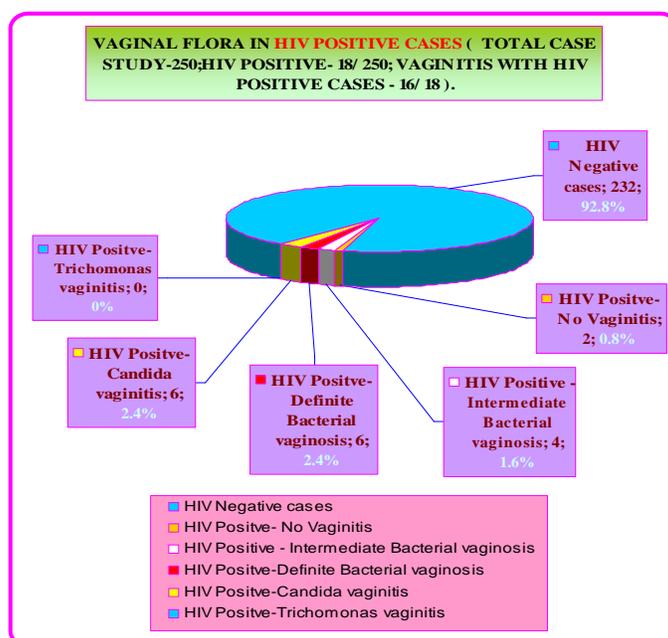
**Table 2** Comparison of the Proportion of Different Types of Vaginitis Observed after Doing Gram/Giemsa Staining of the Vaginal Smear in HIV Positive Women Selected for the Study

Total HIV positive cases out of 250 women →18									
Normal Vaginal flora in HIV positive cases out of 18 → 2(11%)									
Total Bacterial vaginosis cases in HIV positive cases out of 18 →10 (56 % )									
Total cases of vaginitis in HIV positive women (Out of 18)		Intermediate Bacterial vaginosis (Out of 18)		Definite Bacterial vaginosis (Out of 18)		Candida vaginitis (Out of 18)		Trichomonas Vaginitis (Out of 18)	
No	%	No	%	No	%	No	%	No	%
16	89	4	23	6	33	6	33	0	0

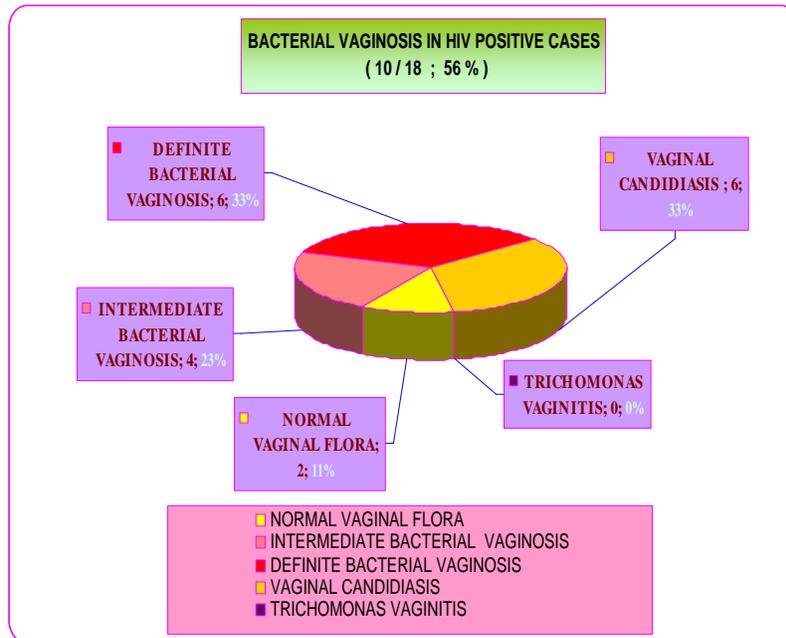
**Table.3** Vaginitis in Symptomatic / Asymptomatic Cases Observed after Doing Gram/Giemsa Staining of the Vaginal Smear in HIV Positive Women Selected for the Study

Total vaginitis case in HIV positive women – 16 / 18.				
GROUP I : HIV Positive women asymptomatic (i.e. No complains of abnormal vaginal discharge).				
GROUP II : HIV Positive women with complains of Abnormal vaginal discharge.(i.e. symptomatic).				
	GROUP - I		GROUP – II	
	No	%	No	%
Total HIV positive cases- 18.	8 out of 18	44.4	10 out of 18	55.6
Normal vaginal flora i.e. No vaginitis.	2 out of 18	11.11	0 out of 18	0
Intermediate Bacterial Vaginosis	2 out of 18	11.11	2 out of 18	11.11
Definite Bacterial Vaginosis	1 out of 18	5.5	5 out of 18	27.7
Vaginal Candidiasis	3 out of 18	16.6	3 out of 18	16.6
<i>Trichomonas vaginitis</i>	0 out of 18	0	0 out of 18	0

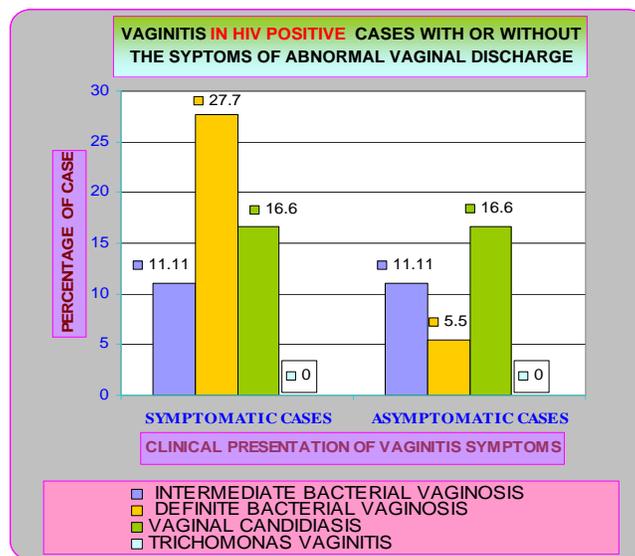
**Figure.1** Observations on the Basis of Gram/Giemsa Staining of the Vaginal Smear Done in HIV Positive Women Selected for Study



**Figure.2** Comparison of the Proportion of Different Types of Vaginitis Observed After Doing Gram/Giemsa Staining of the Vaginal Smear in HIV Positive Women Selected for the Study



**Figure.3** Vaginitis in Symptomatic / Asymptomatic Cases Observed after Doing Gram/Giemsa Staining of the Vaginal Smear in Hiv Positive Women Selected for the Study



Amsel BV positive predictive value for HIV was 42% while lactobacillus positive predictive value for HIV is 56%. Thus Munjoma et al concluded that the sensitivity of the lactobacillus method is as good as

Nugent criteria using Amsel as the gold standard. It is much simpler to perform, less expensive, easy to train and takes much shorter time to perform and therefore has a potential for a much wider use than both

Amsel and Nugent criteria. The simple lactobacillus method has a better PPV for HIV-1 compared to both Amsel and Nugent. Amsel criteria can be improved by removal of subjective criteria.

BV is one of the most frequent conditions encountered in sexually transmitted diseases (STD), genitourinary medicine (GUM) or other reproductive health clinics throughout the world. Vaginal flora changes may enhance HIV acquisition. Lactobacilli dominated vaginal ecology may be an important defense against pathogen acquisition. Women with bacterial vaginosis are more likely than women with normal vaginal flora to acquire infection due to HIV.

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