PREVALENCE OF BACTERIAL VAGINOSIS AMONG HIV POSITIVE ANTENATAL WOMEN IN JUTH - JOS

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ABSTRACT

Background: Bacterial vaginosis and its related organisms have been linked to higher risk of sexual acquisition and transmission of the human immuno deficiency virus (HIV). The association of bacterial vaginosis with higher rates of late miscarriage; preterm prelabour rupture of membranes, chorioamnionitis and preterm births has been documented. These factors have implications for mother to child transmission (MTCT) of HIV. It is therefore pertinent to document the prevalence of bacterial vaginosis among HIV positive women in our setting.

Objective: To determine the prevalence of bacterial vaginosis between HIV positive pregnant women compare to those who are HIV negative in JUTH-Jos.

Study design, setting and subjects: A cross sectional study was carried out among HIV positive pregnant women as the study group and HIV negative pregnant women as controlled group at the antenatal clinic of the Jos University Teaching Hospital (JUTH), Jos.

Main outcome Measures: Bacterial vaginosis status among HIV positive and HIV negative pregnant women at the antenatal clinic, JUTH-Jos. This was compared using the chi square test to determine if there is a statistically significant difference in the two groups.
**Results:** A total of 518 pregnant women were recruited for the study (257 HIV positive VS 261 HIV negative). The overall prevalence of bacterial vaginosis in both groups was 26.6%. The prevalence among women who are HIV positive was 39.3% compared to a prevalence of 14.2% among HIV negative pregnant women. This difference was statistically significant (p<0.05).

**Conclusion:** The prevalence of bacterial vaginosis among pregnant women in JUTH, Jos is high. HIV infection is a significant exposure risk factor for bacterial vaginosis among pregnant women in Jos. A policy for routine screening of bacterial vaginosis among all HIV positive pregnant women in this setting is recommended.

**Key words:** Bacterial vaginosis, HIV, Pregnancy, Jos.
INTRODUCTION

Abnormal vaginal flora is an important cause of obstetrics adverse sequelae. Bacterial vaginosis and its related organisms have been implicated in higher rates of late miscarriage, preterm prelabour rupture of membranes, chorioamnionitis, spontaneous preterm labour, preterm birth and post partum endometritis.

The reported prevalence of bacterial vaginosis in pregnant women ranges from 14% to 21% in western countries\textsuperscript{1, 2, 3, 4}. A prevalence rate of 40.8% has been reported in a non-pregnant population in southern Nigeria\textsuperscript{5}. A study done in Ghana showed a low prevalence of 1.4% among antenatal women\textsuperscript{6}. An estimated 25-30% of women have bacterial vaginosis at any given time, mostly without signs such as fishy odour or discharge\textsuperscript{7}, and this rises to 85% in prostitute populations\textsuperscript{8}.

Bacterial vaginosis is a non-inflammatory clinical condition caused by multiple organisms and available data indicates that four categories of vaginal bacteria are independently associated with this clinical condition, the most predominant among them being Gardnerella
vaginalis\(^2\). Other organisms include Bacteriodes spp., Mobilincus spp., and Mycoplasma hominis. It has been defined as a mild infection of the lower genital tract, characterized by the presence of three of four criteria: 1. Release of a fishy odour after addition of 10% potassium hydroxide, 2. A vaginal PH >4.5, 3. Clue cells in the vaginal discharge, and 4. a milky homogenous, malodorous vaginal discharge\(^9,10\). It is also characterized by a depletion of Lactobacillus spp and an overgrowth of diverse aerobic, anaerobic and micro-aerophilic species\(^11\).

A study of pregnant women demonstrated that women who had bacterial vaginosis on screening were five times more likely to have preterm labour or late miscarriage than those without the condition\(^12\). Of greater clinical importance is the links between bacterial vaginosis and HIV infection\(^13\). There is evidence to support several mechanisms through which bacterial vaginosis and other reproductive tract infections facilitate HIV transmission. Measurement of HIV in genital secretions indicates that HIV infectiousness and susceptibility may be greater in the presence of concurrent reproductive tract infections\(^14\). Also significant is the sharp decline in the concentration of HIV in genital secretions when the infection is treated\(^13,14\).
In view of the relationship between bacterial vaginosis and HIV infection and also the associated risk of adverse obstetric sequelae including increased vertical transmission of HIV during pregnancy, screening women for bacterial vaginosis and treating those infected is a major strategy in the prevention of HIV as well as reducing the risk of mother-to-child transmission of HIV particularly in the setting of high HIV seroprevalence.
LITERATURE REVIEW.

Bacteria vaginosis formally referred to as non-specific vaginitis\textsuperscript{15}, is an important cause of obstetric and gynaecological adverse sequelae. It has been included in the CDC’s list of emerging infectious diseases. Apart from its association with adverse pregnancy outcomes, bacterial vaginosis is associated with increased risk of sexual acquisition of HIV\textsuperscript{13}. It is defined as a mild infection of the lower female genital tract, characterized by a depletion of Lactobacillus spp and an overgrowth of diverse aerobic, anaerobic and microaerophilic species such as Gardnerella vaginalis, Provetella spp, Peptostreptococcus spp., Mycoplasma spp and ureaplasma urealyticum, Mobiluncus spp.

History and Nomenclature

The term ‘bacterial vaginosis’ has evolved over more than a century. The discovery of Lactobacillus spp. in vaginal secretions by Albert Doderlein in 1892 marked the beginning of extensive research into the detailed composition of the vaginal flora. Following his findings, normal vaginal flora was regarded as homogenous, consisting only of Gram-positive rods, mainly of the Lactobacillus spp. Any individual with a more heterogenous pattern was regarded as unhealthy and women with this pattern were described as having an infection known then as non-specific vaginitis. In 1954, Gardner and Dukes\textsuperscript{16} discovered a new
microorganism, which was named Haemophilus vaginalis, and was thought to be the sole organism responsible for non-specific vaginitis$^{15}$. As identification techniques improved with time, this organism was then categorized into the genus Corynebacterium, and thus became known as Corynebacterium vaginalis. Further identification revealed this to be a new genus and, in honour of the work carried out by Gardner in this field, it was renamed Gardnerella vaginalis and the condition became known as Gardnerella vaginitis.

Since G. vaginalis can be cultured from at least 50% of women without signs or symptoms of vaginitis$^{17}$, it has become clear that many microorganisms other than G. vaginalis are associated with the condition. In the early 1980s, various anaerobic bacteria were implicated in causing the characteristic fishy malodour produced by volatile amines in vaginal secretions. This led to the term ‘anaerobic vaginosis’ being adopted until, in 1984, the term bacterial vaginosis was adopted to reflect the polymicrobial alteration in vaginal flora causing an increase in vaginal pH, sometimes associated with an homogenous discharge, but in the absence of a demonstrable inflammatory response$^{18}$. 
Epidemiology and risk factors

Bacterial vaginosis (BV) is the commonest cause of abnormal vaginal discharge in young women of reproductive age. The incidence varies according to population studied.

Several risk factors for BV have been proposed, some of which are still disputed. The trigger for the change from Lactobacillus-dominated flora to BV-associated flora has been linked to many possible factors including age at first sexual intercourse, change in sexual partners, greater number of life-time sexual partners and concurrent sexually transmitted. Other risk factors include cigarette smoking, use of intrauterine contraceptive devices, vaginal douching and racial factors with blacks having a higher prevalence than the caucasians. A 2.6-fold increase in BV was demonstrated in over 300 black women in their third trimester of pregnancy compared to a similar number of white women even after adjustment for confounding factors.

Microbiology

The normal vaginal flora is dominated by Lactobacillus spp., which plays a major part in maintaining the dynamic ecosystem in the
vagina. By metabolizing glycogen in the vagina, Lactobacilli produce lactic acid, which lowers the vaginal pH to below 4.5. This creates a hostile environment, which deters the growth of potentially pathogenic bacteria, particularly G. vaginalis and anaerobes. The low pH generated by the production of lactic acid also reduces the adherence of bacteria to the vaginal epithelium. Other compounds produced by the Lactobacilli such as lactacin B, acidolin and hydrogen peroxide inhibit the growth of other bacteria. Certain Lactobacilli are capable of producing hydrogen peroxide (H₂O₂) and have been shown to reduce BV and Trichomoniasis and have a bactericidal effect on G. vaginalis and Prevotella bivia in vitro. Mobilincus spp. and Bacteroides spp. produce the keto-acid, succinate, as a major biochemical metabolite and this is found in elevated concentrations in women with bacterial vaginosis. The absence of lactic acid and the production of succinate, which also raises vaginal pH, have been postulated to blunt the chemotactic response of polymorphonuclear leukocytes and to reduce their killing ability. This may explain why BV produces no cellular inflammatory response despite the presence of high numbers of potentially pathogenic micro-organisms.

During pregnancy, there is a rise in the overall numbers of vaginal flora compared to the non-pregnant state due mainly to an increase in
lactobacilli by approximately 10-fold. There is a concurrent reduction in anaerobes but relative stability of aerobes. With increasing gestation, the flora tends to become more benign, mainly due to increasing numbers of Lactobacilli such that, at term, the vaginal flora is dominated by organisms of low virulence. Any alteration in this balance such as occurs in BV, can result in adverse sequelae.

**Diagnosis**

- **Clinical features**: Up to half the women diagnosed with BV are asymptomatic. If symptoms are present, they will usually be described as an increased vaginal discharge, which is malodourous. Pruritus and vulvovaginitis are uncommon symptoms and another cause should be sought if these are present. On examination, there may be the characteristic vaginal discharge of BV, which is whitish-grey, thin, homogeneous and adherent to the vaginal walls, and in addition, a fishy smell may be noted.

- **Composite clinical criteria**: There has been the tendency in the clinical setting to misdiagnose BV due to the lack of simple laboratory testing. Various methods exist for the clinical diagnosis of BV. In 1983, Amsel developed a set of composite
clinical criteria, which are still widely used both in clinical practice and in research. The diagnosis is made by finding three of the following four signs: 1. A homogeneous vaginal discharge; 2. An elevated vaginal pH >4.5; 3. a positive ‘whiff’ test on addition of a solution of 10% potassium hydroxide (KOH) to a sample of vaginal secretions; and 4. The presence of ‘clue’ cells on microscopic examination of a wet preparation of vaginal secretions.

The presence of at least three out of four of these criteria is regarded as diagnostic of BV. The assessment of vaginal discharge is the most subjective of these, but still correlates better with the presence of BV than the patient’s own impression of whether or not she has an abnormal vaginal discharge.

Vaginal pH is measured using narrow-range pH paper and assessing the colour change produced by a sample of vaginal secretion taken from the posterior fornix. A low pH virtually excludes BV. An elevated pH is the most sensitive but least specific of the criteria used for the diagnosis of BV, as an increase can also be associated with menstruation, recent sexual intercourse or infection with Trichomonas vaginalis. The ‘whiff’ test involves the addition of a drop of 10% KOH
to a sample of vaginal secretions which produces a characteristic fishy odour in the presence of bacterial vaginosis. It has been demonstrated that some BV microorganisms such as Mobilincus spp. produce trimethylamine, a substance linked to the smell of rotten fish which may explains the characteristics malodour of BV\textsuperscript{29}. As a single entity, the ‘whiff’ test has a positive predictive value of 90% and specificity of 70\%\textsuperscript{30}.

‘Clue cells’ are desquamated vaginal epithelial cells that are densely coated in adherent bacteria such that their borders are indistinct. The detection of clue cells on direct microscopy is the single most sensitive and specific criterion for BV, but is operator-dependent\textsuperscript{31}. Clue cells can be identified on a Gram stain or a ‘wet preparation’ and are regarded as pathognomonic of BV. It has been demonstrated that Gram’s stain diagnosis alone corresponds well to the use of composite criteria\textsuperscript{32, 33, 34} and to the presence of the associated bacteria\textsuperscript{32}.

The main difficulty for obstetricians and gynaecologists is the lack of instant access to direct microscopy, which as discussed above is the most reliable method of diagnosing BV. New rapid tests for BV have been developed which measure metabolic products from anaerobic bacteria such as proline aminopeptidase or are based on DNA probes,
for example ‘Affirm VPIII’ which probes for G. vaginalis genes\textsuperscript{35, 36}. Studies have also demonstrated a strong relationship between BV and absence or depletion of vaginal lactobacilli using molecular techniques\textsuperscript{37}. It is hoped that when simple but accurate test similar to urine pregnancy tests are developed for the diagnosis of BV in antenatal clinic settings, this will enhanced prompt diagnosis and treatment of the condition.

**Obstetric complications associated with bacterial vaginosis**

- **Spontaneous preterm labour and preterm birth**—in the industrialized world, preterm birth accounts for 8-10\% of all births and is the major cause of perinatal morbidity, mortality and subsequent neurodevelopmental problems such as cerebral palsy. The aetiology of preterm birth is multifactorial, but there is now well-accepted evidence to implicate infection as a cause in up to 40\% of cases\textsuperscript{38, 39}. Abnormal genital tract colonization has been found to be associated with preterm birth\textsuperscript{40, 41}. The mechanism by which BV can induce preterm birth is linked to ascending genital tract infection, with an immune response resulting in the production of pro-inflammatory cytokines such as interleukins and tumour necrosis factor\textsuperscript{42, 43}. Phospholipase A\textsubscript{2}
and phospholipase C are enzymes responsible for cleaving arachidonic acid, the obligate precursor for prostaglandin synthesis, from glycerophospholipids in the cell membrane and have been found to be elevated in the lower genital tract of women with BV\textsuperscript{44, 45}.

- **Postpartum endometritis**—postpartum endometritis is a relatively common obstetric complication and, although the incidence is higher in women undergoing caesarean section, it may also occur following a vaginal delivery. Risk factors include prolonged rupture of membranes, prolonged labour and increased number of vaginal examinations. Postpartum endometritis following a Caesarean section tends to develop within 2 days and is described as early endometritis. This is most likely to be due to the introduction of bacteria into the endometrial cavity at delivery. Women who have a vaginal delivery usually develop late endometritis, which can occur up to 6 weeks post natally. This delayed infection tends to result from ascending over a course of time. Facultative anaerobes linked to BV are commonly isolated in cases of endometritis. In a study which examined the rate of postpartum endometritis in women delivered by Caesarean section, those women with BV were nearly 6 times more likely to develop the condition than
women without BV despite antibiotic prophylaxis\textsuperscript{4}. In another study, which looked at women delivered both vaginally and by Caesarean section, BV was the strongest predictor of postpartum endometritis irrespective of mode of delivery\textsuperscript{46}. It is therefore recommended that women should be screened and treated for BV in late pregnancy. The effective use of antibiotic regimens, especially in women undergoing an elective or emergency Caesarean section, reduces postpartum complications. This is particularly important in the setting of HIV where Caesarean section is offered as an intervention for preventing mother to child transmission of HIV.

**Bacterial vaginosis and sexual acquisition of HIV**

Several studies have demonstrated the possibility of an association between BV and the transmission of HIV\textsuperscript{23, 26, 47}. It has been shown that the presence of hydrogen peroxide-producing Lactobacilli in the vagina results in a more acidic environment, which is not only toxic to BV-associated flora but also to HIV\textsuperscript{26}. It is postulated that a lower vaginal pH may block the production of CD4 lymphocytes whereas a higher, more alkaline pH associated with BV, may enhance HIV survival.
It has been shown that the BV microorganisms, especially M. hominis, are able to increase the activity of a soluble HIV-inducing factor and, therefore, increase HIV-1 expression. Genital tract infection with G. vaginalis, which is commonly isolated in BV, has been shown to be able to stimulate HIV-1 production and hence increase the likelihood of sexual transmission. HIV may promote abnormal flora in the vagina or BV may enhance the acquisition of HIV through sexual transmission. The evidence available supports a causal relationship between BV and HIV and BV may be an independent risk factor or a cofactor for transmission of HIV infection. A better understanding of the pathogenesis of BV and methods to reduce the risk of BV-related transmission are required.

**Treatment of Bacterial vaginosis**

The polymicrobial nature of BV poses a problem in attempting to find the most appropriate drug therapy. There is a need for drug therapy that is both sufficiently broad spectrum, but targeted against the bacteria involved in BV. Many trials have suggested different antibiotics with varying doses and treatment regimens. Currently, treatment recommendations worldwide advocate the use of either metronidazole or clindamycin orally or vaginally. Oral metronidazole is generally well tolerated, but may give rise to nausea and a metallic
taste in the mouth. Despite this, allergy to metronidazole is rare; the
drug is inexpensive and also Lactobacilli sparing. Metronidazole vaginal
gel produces systemic levels of drug far below those of the oral
preparation spares Lactobacilli but costs more than the oral
preparation. Clindamycin cream is the most expensive of the
treatments and has been shown to delay return of Lactobacilli to the
vagina compared to metronidazole. Both oral and vaginal preparations
of clindamycin have been linked to the development of
pseudomembranous colitis\textsuperscript{50}. However, clindamycin 2% vaginal cream
is associated with few side effects and only a very small fraction is
absorbed systemically.

Recently, randomized placebo-controlled trial has shown the efficacy of
probiotics used as adjunct to metronidazole in the treatment of BV\textsuperscript{51}.
Probiotics helps to restore the normal vaginal microbiota with
lactobacilli which has an important impact on BV proliferation.
JUSTIFICATION FOR THE STUDY

The association between bacterial vaginosis and preterm labour is well known. Also there is a link between bacterial vaginosis and sexual acquisition of HIV infection which poses a risk for mother-to-child transmission if this infection if not identified and treated in pregnancy. Programs that offer testing and counseling for HIV infection as well as intervention to prevent mother-to-child transmission of HIV are rapidly expanding in response to the growing HIV epidemic in the country. However, screening for STI’s and BV is still limited although it is well known that these agents facilitate HIV transmission.

In view of the relationship between bacterial vaginosis and HIV infection and also the associated risk of adverse obstetric sequelae including increased vertical transmission of HIV during pregnancy, screening women for bacterial vaginosis and treating those infected is a major strategy in the prevention of HIV as well as reducing the risk of mother-to-child transmission of HIV particularly in the setting of high HIV seroprevalence. Formulating policies for routine screening for BV among HIV positive women will depend on data showing a significant difference in the prevalence rate of BV in HIV positive pregnant women compare to those who are HIV negative. This fact justifies the need for this study.
AIMS AND OBJECTIVES

The broad aim of this study is to determine the prevalence of bacterial vaginosis among HIV infected pregnant women at the Jos University Teaching Hospital, Jos.

The specific objectives are:

1. To determine the prevalence of bacterial vaginosis among HIV infected pregnant women
2. To determine the prevalence of bacterial vaginosis among HIV negative women
3. To compare the prevalences of bacterial vaginosis in the two groups.
4. From the finding above make recommendation on policy for screening and management of bacterial vaginosis in our institution.

Null hypothesis: There is no statically significant difference in the prevalence of bacterial vaginosis between pregnant women who are HIV positive and those who are HIV negative in JUTH.
MATERIALS AND METHOD

Study area and Design

The study is cross-sectional in design and was carried out at the antenatal clinic of the Jos University Teaching Hospital (JUTH), Jos, between 1st January 2007 and 31st December 2007. The laboratory examination was carried out at the AIDS Prevention Initiative in Nigeria (APIN)/Harvard PEPFAR supported laboratory of JUTH, Jos.

Study subjects: the study participants were selected from the antenatal clinic after obtaining consent for the study.

Selection criteria: The following criterion was used to select the participants for the study:

- Informed consent to participate in the study
- Those women who had gone through voluntary counseling and testing (VCT) for HIV by the PMTCT nurse counselors
- Those who are HIV positive by double rapid determine test and confirmed with Western blot in the JUTH-APIN/PEPFAR laboratory
- Those who are HIV negative by double rapid determine test were included as controls

Those that are HIV positive by western blot test were screened for bacterial vaginosis. Those who are HIV negative were screened for
bacterial vaginosis as a control group for comparison to determine statistical significance in the prevalence of the condition between the two groups. The diagnosis of bacterial vaginosis was based on Amsel diagnostic criteria\textsuperscript{20}.

**Diagnosis of BV by Amsel Criteria (Amsel et al, 1983)**

A positive diagnosis was made if 3 of the following 4 criteria are present:

1. Homogeneous vaginal discharge
2. A “fishy” odour is produced when 10\% Potassium Hydroxide is added to vaginal secretion. (Whiff test).
3. Vaginal pH > 4.5
4. “Clue cells” are found on microscopy (wet mount and Gram stain).

Diagnostic criterion 1, 2, and 3 were done in the Antenatal clinic side laboratory by the researcher. Consent for participation was obtained in each case by the researcher before examinations were done.

Examination for detection of clue cells by microscopy was done by the laboratory scientist in the APIN-PEPFAR supported laboratory of the Jos University Teaching Hospital, Jos.
**Whiff test (Pheifer et al, 1978)**

**Principle:** Amines are produced by the decarboxylation of amino acids in the presence of Bacterial vaginosis. The amines produced become volatile in the presence of potassium hydroxide giving a fishy odour. A drop of the vaginal secretion was placed on a glass slide, followed by a drop of 10% potassium hydroxide, mixed. A positive case gives a fishy odour.

**PH value**

This was determined by means of a pH dipstick onto the secretions on the speculum. PH values above 4.5 are diagnostic of bacterial Vaginosis.

**Detection of BV by microscopy (wet mount and Gram stain)**

A swab of the vaginal fluid from the posterior fornix was placed in normal saline on a microscope slide, covered with a cover slip, and examined microscopically with x10/40 objective. Positive cases showed clue cells (epithelial cells with granules and heavily coated with bacteria with the peripheral borders obscured).

Gram stain of the vaginal fluid was examined under x100 objective for clue cells, to have a clearer picture.
**Sample size determination:** the sample size for the study was determined using the formula below and a prevalence of BV among pregnant women of 21%\(^1, 2, 3, 4\).

\[
N = \frac{z^2 pq}{D^2}
\]

N- Minimum sample size
Z- 1.96 at 95% confidence level
p- Prevalence of the condition
D-level of significance, 0.05 at 95% confidence level

This gives a minimum sample size of 255 for each group. This is approximated to 260 for HIV pregnant women and 260 for HIV negative pregnant women as controls for the study.

**Data management and analysis**

The data was managed using Epi info version 3.3 October 2004, CDC Atlanta, USA. Relevant graphs were generated using Epi-graphs. The Chi Square test was done to determine the strengths of association between exposure and outcome variables in the experimental and controlled groups. Association was considered statistically significant at p-value <0.05.
**Ethical clearance:** Ethical clearance was obtained from the JUTH ethical clearance committee to conduct the study. The participants signed consent for participation. Other ethical considerations for the study participants were as follows:

1. Confidentiality of test results for each participant was ensured.
2. Those who were found HIV positive were linked to access specific treatment, care and other interventions for their condition and for prevention of mother to child transmission of HIV.
3. Those who were screened positive for bacterial vaginosis were given appropriate treatment at no cost to them.
4. Participation was purely based on volunteerism and not coercion and participants were at liberty to decline participation without loosing their rights to other care available to them in the clinic.
Results:

This cross-sectional study was done among antenatal women who are HIV Positive as the experimental group and those who are HIV Negative as controls to determine the prevalence of bacterial vaginosis in the two groups and to test if there is a statistically significant difference in the two groups.

During the study period, a total of 518 pregnant women were included in the study comprising 257 HIV positive and 261 HIV negative women. The mean age was 27.8 years with a range 17-40 years and standard deviation (S.D.) ±5.3 years.

The overall prevalence of bacterial vaginosis irrespective of HIV status was 26.6% (Table I and fig. 1). The prevalence of bacterial vaginosis among HIV positive pregnant women was 39.3% compare to 14.2% among pregnant women who are HIV negative (Table I and fig. 2). This difference was statistically significant (chi square uncorrected=41.82, chi square Mantel -Haenszel=41.74), P-value<0.001.
Table I. Cross tabulation of HIV Status and Bacterial vaginosis in JUTH-Jos

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<th>Positive for Bacterial vaginosis</th>
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<td>HIV 1 Positive</td>
<td>156 (60.7%)</td>
<td>101 (39.3%)</td>
<td>257 (100.0%)</td>
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<tr>
<td>HIV Negative</td>
<td>224 (85.8%)</td>
<td>37 (14.2%)</td>
<td>261 (100.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>380 (73.4%)</td>
<td>138 (26.6%)</td>
<td>518 (100.0%)</td>
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**Statistical tests**

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<th>P-value</th>
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<tr>
<td>Uncorrected</td>
<td>41.82</td>
<td>0.001</td>
</tr>
<tr>
<td>Mantel-Haenszel</td>
<td>41.74</td>
<td>0.001</td>
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</table>
Fig. 1. Pie chart of BV status of pregnant women in JUTH-Jos
P-value<0.001

Fig. 2. Bar Chart of BV against HIV status of pregnant women in JUTH-Jos.
Discussion

This cross-sectional study was done to determine the prevalence of bacterial vaginosis among HIV positive antenatal women in Jos and to determine the difference compared to those who are HIV negative. This is probably the first study in Nigeria comparing the prevalence of BV among pregnant women who are HIV positive with those who are HIV negative.

The prevalence of bacterial vaginosis found in this study is 26.6% irrespective of HIV status. This prevalence is higher compared to 10.5% and 17.0% respectively in two different studies among antenatal populations in South-eastern Nigerian settings\textsuperscript{52,53}. This difference in prevalence could be explained by differences in the characteristic of the population studied. The present study consists of a larger sample size and about half of the women studied were HIV infected which is a risk factor for bacterial vaginosis as found in this study. Moreover, prevalence of BV had been reported in excess of 50% among pregnant women in sub-Saharan Africa\textsuperscript{54}. This higher prevalence in sub-Saharan African population may not be unconnected to the high prevalence of HIV infection in the region. From these
studies, it is apparent that the prevalence of BV is likely to be higher in areas were the burden of HIV infection is heavy.

The prevalence of BV among HIV positive pregnant women in this study is 39.3% compare to 14.2% among pregnant women who are HIV negative. This difference is statistically significant (p-value 0.001, table I). This finding suggests that HIV is a significant exposure risk for bacterial vaginosis. It is possible that HIV infection alters the local immune mechanisms in the lower genital tract that puts those women with HIV at higher risks for bacterial vaginosis organisms to thrive and proliferates in the vagina. Furthermore, studies have shown that HIV load in the genital tract correlates positively with BV and inversely with absence of BV\textsuperscript{55}. The increase in HIV load in the genital tract of women with BV leads to more exposure of the baby to this high viral load during the process of labour and delivery thereby increasing the risk of mother to child transmission of HIV if this infection is not identified and treated in pregnancy. This therefore implies that identification and treatment of bacterial vaginosis is an important strategy in the prevention of HIV transmission particularly with respect to mother to child transmission. In addition, other morbidities such as prelabour rupture of membranes, chorioamnionitis and preterm labour associated with BV are all well known risk factors that accelerate
transmission from mother to child of HIV\textsuperscript{56}. It is therefore sensible to put down a policy that ensures screening for bacterial vaginosis particularly among pregnant women who are infected with HIV. This should be a priority intervention particularly in settings of high HIV prevalence. However, were resources are not scarce this intervention should be extended to pregnant women who are HIV negative. This is important in view of the fact that BV increases the risk of HIV acquisition particularly in those women with serodiscordant partners who may not be using condoms consistently and correctly as recommended. Primary infection with HIV during pregnancy is associated with rapid increase in viral load which is known risk factor for vertical transmission from mother to child.

Future research in this area should follow up the babies to compare the MTCT rates in those whose mothers were infected with bacterial vaginosis with those who were negative for bacterial vaginosis after controlling for other factors to see if there is a significant difference in the risk of transmission in the two groups. Another area for future research is to evaluate the impact of mass screening and treatment of BV on MTCT rates and transmission among sero-discardant relationships in which the female partner is HIV infected.
In conclusion, this study showed that HIV infection is a significant exposure risk factor for bacterial vaginosis among pregnant women in the Jos University Teaching Hospital, Jos. It is therefore recommended that a policy be put on ground to ensure routine screening and treatment of bacterial vaginosis in pregnant women who are found HIV positive during antenatal clinics in Jos. When a multicentre study in the country confirms this finding, a national policy and guidelines for screening and treating bacterial vaginosis among HIV pregnant women could be developed.
References:


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