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Original Research Article

A study of Bacterial Vaginosis in Ante-Natal Patients

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ABSTRACT

Background
This study was carried out to determine the prevalence of bacterial vaginosis in pregnant women and to assess the associated morbidity and pregnancy outcomes, as well as the correlation between bacterial vaginosis (BV) and HIV Infection.
Methods
A total of 100 antenatal women were examined and detailed history obtained. Under antiseptic precaution high vaginal swabs were taken with the help of a sterile vaginal speculum without performing per vaginal examination. Various tests have been performed to confirm BV like whiff test, gram stain, vaginal pH and clue cells.
Results
Prevalence of BV was highest in the age group 26-30 years followed by those over 30 years. 26.47 % of women with BV developed preterm labour as compared to 10.60% of women without BV. 32.35% of women with BV had premature rupture of membranes (PPROM) as compared to 13.63% of women without BV. 23.52% of women with BV had PROM as compared to 10.60% of women without BV. 17.64% of women with BV reached upto term.
Conclusion
The average age recorded was 25 yrs. Maximum distribution of population was in the age group 26-30 yrs. Primi gravida formed the majority of the study population. Meitei ethnic group also constituted the majority of the study population. The prevalence of BV in this study was 34%, mostly affecting pregnant women above 25 years of age. The prevalence is higher among the Muslims and in HIV positive patients. BV is associated with adverse pregnancy outcome such as preterm labour (PTL), pre-term premature rupture of membranes (PPROM) and premature rupture of membranes(PROM).
Keywords: Bacterial Vaginosis, HIV, Antenatal Women, Pregnancy Outcomes.

INTRODUCTION

The vaginal flora constitutes a dynamic and complex ecosystem, with many different aerobic and anaerobic organisms present at one time. This means that any sampling of vaginal flora is only a snap-shot in time and gives no indication of the changing pattern under different circumstances.

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The term “bacterial vaginosis” (BV) has evolved over more than a century. Gardnerella vaginalis is an important causative organism for bacterial vaginosis. Half of the women diagnosed with BV are asymptomatic. When clinically symptomatic, BV is characterised by - smelly, watery, grey or yellow vaginal discharge, with odour often worsening right after intercourse, vaginal soreness after intercourse and mild vulval itching or burning.[1]

The absence of straightforward laboratory testing has led to a tendency for misdiagnosing BV in the clinical context. There are numerous techniques available for BV clinical diagnosis. A set of composite clinical criteria that Amsel[2] created in 1983 are currently commonly employed in research as well as clinical practice.

The most common method for diagnosis of BV is Gram stain. The grading of the microbial flora seen on Gram stained slides provides a cheap, simple, reproducible and objective method of diagnosing BV.

In this study we wanted to determine the prevalence of Bacterial vaginosis in pregnant women and to assess the associated morbidity and pregnancy outcomes, as well as the correlation between BV and HIV infection.

MATERIALS & METHODS

The study was carried out in those pregnant women attending ante-natal clinic and admitted in ante-natal ward/labour ward of Obstetrics and Gynaecology department of Regional Institute Medical Sciences hospital, Imphal. A total number of hundred (100) cases were examined, studied and analysed.

In all the cases, a detailed history was taken including age, address, parity, occupation, socio-economic status, last menstrual period , previous obstetrics history, number of living children, abortion (induced/spontaneous), preterm delivery, PROM, Intra uterine device (IUD), Low birth weight (LBW), HIV status, previous contraception - IUCD with duration and smoking. Those patients with multiple pregnancy, placenta previa, history suggestive of cervical incompetence, vaginal bleeding, antibiotic use in the current pregnancy, suspected uterine malformation were not included in the study.

Each patient was subjected to a thorough clinical and obstetrical examination as per proforma enclosed. Routine laboratory investigation were carried out which included ABO grouping and Rh typing, Hb%, total leucocyte count, differential leucocyte count, bleeding time, clotting time, ESR, Urine routine examination, VDRL & HIV (after proper counselling). High vaginal swab was examined for the presence of BV.

Study Procedure

Under antiseptic precaution high vaginal swabs were taken with the help of a sterile vaginal speculum without performing per vaginal examination. Various tests have been performed to confirm BV. Vaginal discharge sampled from the posterior fomix is used to determine vaginal pH utilizing narrow-range pH paper and color change analysis. pH > 4.5 in BV. The "Whiff" test involves adding a drop of 10% KOH to a sample of vaginal secretions, which when BV is present, gives off a distinct fishy odor. Clue cells can be identified on a “wet mount” smear. The vaginal smears were Gram-stained and scored for BV according to Nugent's criteria by an experienced laboratory technician.

RESULTS

In the present study 100 patients admitted in the ante-natal ward/labour ward of Obstetric and Gynaecology department, RIMS were examined, studied & analysed. In all the cases, a detailed history of each case, routine blood and urine examination and a thorough clinical and obstetrical examination were performed.

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		Vaginal flora morphology	
Age	**N**	**BV (%)**	**N (%)**
<20 yrs	11	03(27.27)	08(72.72)
21-25 yrs	20	04(20)	16(80)
26-30 yrs	42	18(42.85)	24(57.14)
>30 yrs	27	09(33.33)	18(66.66)

Table 1: Age distribution

From the above table 1 it is evident that prevalence of BV was maximum in the age group 26-30 yrs followed by >30 yrs.

Parity		Vaginal flora morphology	
		BV (%)	**N (%)**
P0<0	42	14(33.33)	28(66.66)
P1+0	34	11(32.35)	23(67.64)
P2+0	15	06(40.00)	09(60.00)
P3+0 & above	09	03(33.33)	06(66.66)

Table 2: Parity

From the above table 2 it is evident that primi gravida constitutes the maximum of the study group. Prevalence of BV was maximum in P_2+0 group.

Location	**N**	Vaginal flora morphology	
		BV (%)	**N (%)**
Urban	67	23(34.32)	44(65.67)
Rural	33	11(33.33)	22(66.66)

Table 3: Location

From the above table 3, it is evident that prevalence of BV was almost the same in the urban and rural group.

			Vaginal flora morphology	
			BV (%)	**N (%)**
Smoking	Yes	0	0(0)	0(0)
	No	100	34(34.00)	66(66.00)
IUCD	Yes	27	10(37.03)	17(62.96)
	No	73	24(31.23)	39(68.76)

Table 4: Correlation between BV and risk factors

The above table 4 shows that none of the patients in the study group was a smoker and prevalence of BV was slightly more in patients who use IUCD.

Characteristic		**N**	Vaginal flora morphology	
			BV (%)	**N (%)**
HIV infection	Positive	7	03(42.85)	04(57.14)
	Negative	93	31(33.33)	62(66.66)
VDRL	Positive	00	00(00)	00(00)
	Negative	100	34(34.00)	66(66.00)

ISSN: 0975-3583,0976-2833 VOL12, ISSUE 10, 2021

Table 5: Association between BV and HIV & syphilis

Table 5 shows that none of the patients are VDRL reactive. 42.85% of HIV positive patients have BV as compared to only 33.33% of the HIV negative patients.

		PTL	PPROM	PROM	TP with intact membrane
BV	Yes	09(26.47)	11(32.35)	08(23.52)	06(17.64)
	No	07(10.60)	09(13.63)	07(10.60)	43(65.15)

Table 6: Co-relation between BV and PTL, PPROM & PROM

From the above table 6, it is evident that 26.47 % of women with BV developed preterm labour as compared to 10.60% of women without BV. 32.35% of women with BV had PPROM as compared to 13.63% of women without BV. 23.52% of women with BV had PROM as compared to 10.60% of women without BV. 17.64% of women with BV reached upto term.

DISCUSSION

The present study was undertaken to determine the prevalence of BV in pregnant women and to find a correlation of BV with demographic profile, risk factors and HIV infection.

Of the total 100 women enrolled for the study majority were primi gravidae, above 25 years of age, from urban area, meitei/hindu by religion and non- smoker.

Prevalence of BV in the present study is 34% which co-relates with the findings of Eschenbach DA et al,[3] 1988 (33%), Hoist E et al,[4] 1987 (34%), Bhalla et al, 2007[5] (34%).

The incidence of BV varies according to the population studied. The contrasting prevalence figures maybe because of various reasons such as differences in economic status and education background, study populations and method used for diagnosis of BV.

In the present study prevalence of BV is maximum in 26-30 yrs of age group which co-relates with findings of Sewankambo N et al, 1997.[6] The age profile of persons with bacterial vaginosis is remarkably different from that of most other sexually transmitted infections. Unlike most other infections in females, where the highest rates are almost always seen in women under 25, there is a strong correlation between the presence of bacterial vaginosis and being older than 25. Women under 25 report having more sexual partners and changing partners more frequently, but they also report fewer incidences of BV and being against the suggested method of sexual transmission. Studies on women receiving in vitro fertilization therapy have revealed that young women are substantially more likely to have BV, therefore this association may be more complicated than expected.

In the present study we found no association between prevalence of BV with parity. The prevalence is a bit high in P2+0 group. Otherwise prevalence is almost the same in all the groups.

Additionally, there is evidence of a racial discrepancy in BV, with women of Afro-Caribbean descent living in the UK experiencing it at a higher rate than those of Caucasian origin. Additional studies have demonstrated that black women are more likely than white women to get BV. Royce et al.'s research[7] revealed that pregnant Black and White women have different vaginal flora. Even after controlling for confounding variables, they showed that over 300 pregnant black women had a 2.6-fold higher blood pressure in the third trimester of their pregnancy than did a comparable number of pregnant white women.

The higher prevalence of BV among the Muslims may be due to vaginal douching which is more commonly practiced by the Muslims. The results of Hawes SE et al., 1996,[8] which demonstrate that douching is independently linked to developing BV (HR 2.1 95% CI 1,0-4.3), may be related to this. According to a recent study conducted in inner London hospitals, black race was no longer significantly connected with BV once vaginal douching was taken into account. Despite being a single study, it raises the possibility that cultural differences, rather than genetic or socioeconomic variations, may be the cause of the varying

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BV rates among racial groups.

In the present study, we found no association between prevalence of BV with locations, as almost equal prevalence was seen in women from urban areas and those from rural areas. There have also been reports linking smoking to BV. Nevertheless, as none of the study's subjects smoked, no such link was discovered. Research from Sweden and the UK have repeatedly linked smoking to BV and STDs. According to data from a London prenatal population, the population attributable risk for current smokers compared to past and non-smokers is 8.5%. Results from a pregnant population, however, might not be very generalizable. Although smoking may weaken immunity and make infections more likely, it may also be a sign of poor health-seeking behavior. The relationship between inadequate health care seeking practices and the prevalence of bacterial vaginosis has not been examined in any research. Given that a sizable portion of the UK population with more than five lifetime sexual partners smokes compared to non-smokers, smoking may be a predictor of sexual behavior. However, changes in partner preferences or aging may complicate that relationship.

According to the current study, IUCD users had a slightly higher prevalence of BV than non-users. Studies conducted in Sweden and Belgium discovered a strong correlation between BV and IUCD use when compared to oral or barrier contraceptive users. However, the same investigations were unable to detect any correlation between IUCD users and non-contraceptive users. Compared to non-contraceptive users, IUCD patients had a markedly higher incidence of BV, according to two American studies. Since women over 30 are more likely to use IUDs and have a higher prevalence of BV, any correlation observed may be a product of the study's age distribution.

Seven of the ladies in this study were HIV positive. Compared to 33.33% of HIV-negative women, 42.85% of HIV-positive women have a BV prevalence. Numerous investigations have indicated that there may be a connection between BV and HIV transmission. According to research by Klebanoff et al., the presence of hydrogen peroxide-producing Lactobacilli in the vagina creates an environment that is more acidic and harmful to HIV as well as BV-associated flora. According to their hypothesis, a lower vaginal pH may consequently prevent the development of CD4 cells, while a higher, more alkaline pH linked to BV may promote HIV survival. According to Cohen et al., BV is associated with a higher detection of IL-10, an anti-inflammatory cytokine, in endocervical secretions. This, in turn, raises the sensitivity of macrophages to HIV-1 infection.

It has been demonstrated that BV microorganisms, particularly M. homoinis, can raise the expression of HIV-1 by increasing the activity of a soluble HIV-inducing factor (HIF). It has been demonstrated that a genital tract infection with G. vaginalis, which is frequently isolated in BV, can boost HIV-1 production and hence raise the risk of sexual transmission. One cross-sectional study in Thailand was carried out in 144 commercial sex workers and results showed that 47% of women infected with HIV had BV compared to 24% who were not infected with HIV. Results from another study in rural Uganda demonstrated that HIV-1 frequency in young women with normal vaginal flora was half that of women with severe BV. HIV may encourage aberrant vaginal flora, or BV may make HIV more easily acquired through intercourse. The evidence that is now available points to a causal link between BV and HIV, suggesting that BV may operate as a co-factor or independent risk factor for the spread of HIV infection.

In the present study the incidence of preterm labour (PTL), PPROM, PROM in women with BV is higher than that of women without BV.

About 15–20% of pregnant women will have BV, and compared to women without BV, these women are up to 4 times more likely to have a PTB. The first case-control research indicating a link between low birth weight and BV was published by Eschenbach et al. The prevalence of BV, which is determined by an aberrant gas liquid chromatography pattern from vaginal secretions, was compared between 114 women who gave birth at term and 57 women who gave birth prematurely (49% BV). Gravett et al[9] and Martius et al[10] provided more

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evidence of the importance of BV by reporting that PPROM and births prior to 37 weeks were linked to BV detection.

Ascending genital tract infection is the mechanism via which BV can cause preterm birth (PTB), and pro-inflammatory cytokines such interleukin-lo, interleukin-1α^, and tumor necrosis factor-o are produced as a result of an immunological response. Intercellular signaling is aided by cytokines, which are proteins released during immunologically based inflammatory processes. They exist throughout the course of a typical labor, but larger quantities have been seen in the amniotic fluid of women who experience spontaneous preterm labor because of infection. This initiates a chain reaction that draws in inflammatory mediators like prostaglandins. This ultimately results in uterine contractions and cervical ripening, which may cause preterm labor. Women with BV have been discovered to have higher levels of phospholipase A2 and C in their lower genital tracts. These enzymes are responsible for cleaving arachidonic acid, the obligatory substrate for prostaglandin synthesis, from glycerophospholipids in the cell membrane.

CONCLUSION

The average age recorded was 25 years. Maximum distribution of population was in the age group 26-30 years. Primi gravida formed the majority of the study population. Meitei formed the majority of the study population. The prevalence of BV in this study was 34% mostly affecting pregnant women above 25 years of age. Prevalence is higher among the Muslims and in HIV positive patients. BV is associated with adverse pregnancy outcome like PTL, PPROM and PROM.

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