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Original research article

THE PREVALENCE OF BACTERIAL VAGINOSIS AMONG WOMEN ADMITTED WITH PRETERM LABOUR

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Abstract

The aetiology of preterm labour is likely to be multifactorial. Prevention of morbidity lies in identifying high-risk patients. Various measures like risk scoring, biophysical, and biochemical markers were used to predict preterm labour but the overall predictive value was found to be poor and was not useful. Based on the proportion of bacterial vaginosis as 30% with a relative precision of 20% at 95% confidence level, the sample size was estimated to be 224 preterm pregnant women. A total of 225 pregnant women with preterm delivery were included in our study based on consecutive sampling during the study duration. The prevalence of bacterial vaginosis among patients with preterm labour was 12% (95% CI: 8.05%-16.98%). The mean age of the patients with bacterial vaginosis was significantly lesser than those without bacterial vaginosis (p=0.006).

Keywords: Bacterial vaginosis, preterm labour, prevalence

Introduction

Preterm labour is one of the most challenging obstetric complications encountered. PTL is one of the most important determinants of adverse infant outcomes in terms of both survival and quality of life. It complicates about 5-10% of all pregnancies and in about 30% it is due to deliberate medical intervention and in the remaining it is due to spontaneous PTL. 75% of all perinatal deaths are associated with PTL [1].

The aetiology of preterm labour is likely to be multifactorial. Prevention of morbidity lies in identifying high-risk patients. Various measures like risk scoring, biophysical, and biochemical markers were used to predict preterm labour but the overall predictive value was found to be poor and was not useful.

The single most predictor of preterm labour is previous preterm labour. So, identification of preterm labour in a nulliparous patient is difficult [2].

The last century has been marked by a persistent rise in the rate of PTL representing the failure of modern obstetrics to understand the complexity of phenomena and to develop effective PTL preventive interventions. Risk factors fail to predict as many as 70% of

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PTL. Of the many approaches to PTL prevention that have been investigated, no single intervention has been thoroughly studied as much as transvaginal scan (TVS) and vaginal smear examination in screening for PTL [3].

6-32% of pregnant women are affected by Bacterial vaginosis (BV). It is characterized by an imbalance in the vaginal microflora-the numbers of lactobacilli morphotypes are reduced and the numbers of anaerobic bacterial morphotypes are increased. It may be symptomless or it may be accomplished by increased vaginal discharge, with or without a fishy foul smell. Usually, there are no clinical signs of infection in the vaginal mucosa in women with BV. It is a risk factor for preterm delivery, preterm premature rupture of membranes (PPROM), chorioamnionitis and postpartum endometritis [4].

A recent meta-analysis, which included 18 studies showed that BV was significantly associated with preterm delivery, miscarriage and maternal infection. One of the most common genital infections in pregnancy is Bacterial vaginosis. BV is associated with a two to threefold increase in infection of amniotic fluid, infection of the chorion and amnion and histological chorioamnionitis. Intrauterine infection may occur early in pregnancy or even before pregnancy. Many times patients remain undetected and asymptomatic for months until preterm labour or premature rupture of membranes (PROM) occurs.

Preterm labour precedes almost half of preterm births. In around 12% of pregnancies, preterm birth occurs and is one of the most important causes of neonatal mortality worldwide [5].

According to studies conducted by Eschenbach DS *et al*. presence of clue cells is the single most reliable predictor of BV. At least 20 per cent of the epithelial cells should be clue cells, in women with BV. Using gram stain as the gold standard, the sensitivity of Amsel's criteria for diagnosis of BV is over 90 per cent. Specificity is 77 per cent.

In India not, many studies have been done to estimate the association of BV with peripartum and perinatal complications, so this study was done to know the prevalence of BV in Preterm labour [6].

Methodology

Materials and Methods

This study was conducted in the Department of Obstetrics and Gynaecology and Department of Microbiology.

Study design

A hospital-based cross-sectional study was conducted among the patients admitted with preterm labour.

Sample size

Based on the proportion of bacterial vaginosis as 30% with a relative precision of 20% at 95% confidence level, the sample size was estimated to be 224 preterm pregnant women.

A total of 225 pregnant women with preterm delivery were included in our study based on consecutive sampling during the study duration.

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Study population

Patients admitted with preterm labour in preterm labour.

Selection criteria

The patients were selected from the target population based on the inclusion and exclusion criteria.

Inclusion criteria

Patients with:

1. Gestational age less than 37 weeks.
2. Regular uterine contractions (four or more in 20 minutes or eight or more in 60 minutes), each lasting more than 40 seconds.
3. Cervical dilatation equal to or greater than 1 cm but less than 4 cm and effacement equal to or greater than 80%.
4. Intact foetal membranes.
5. Threatened pre-term labour.

Exclusion criteria

Patients with:

1. Multiple gestations.
2. Cervical cerclage.
3. Current use of corticosteroids.
4. PPROM.
5. Patients who are not willing to participate in this study.

Results

Table 1: Distribution of patients according to the prevalence of bacterial vaginosis (N=225)

Bacterial vaginosis	n (%)
Present	27 (12.0)
Absent	198 (88.0)

The prevalence of bacterial vaginosis among patients with preterm labour was 12% (95% CI: 8.05%-16.98%).

Table 2: Distribution of patients according to the prevalence of puerperal sepsis (N=225)

Puerperal sepsis	n (%)
Present	6 (2.7)
Absent	219 (97.3)

The prevalence of puerperal sepsis was 2.7% (95% CI:0.98%-5.71%).

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Table 3: Association of gestational age group with birth weight (N=225)

Gestational age group	Birth weight, n (%)			p-value
	SGA	Normal	LGA	
< 33 weeks	10 (7.0)	127 (88.8)	6 (4.2)	0.098
33 to 37 weeks	8 (9.8)	65 (79.3)	9 (11.0)	

There was no association between the gestational age group and birth weight.

Table 4: Association of age with the presence of bacterial vaginosis (N=225)

Bacterial vaginosis	Mean (SD)	p-value
Present	26.1 (3.2)	0.006
Absent	28.3 (4.0)	

The mean age of the patients with bacterial vaginosis was significantly lesser than those without bacterial vaginosis (p=0.006).

Table 5: Association of gestational age with the presence of bacterial vaginosis (N=225)

Gestational age	Bacterial vaginosis, n (%)		p-value
	Present	Absent	
< 33 weeks	24 (16.8)	119 (83.2)	0.004
33 to 37 weeks	3 (3.7)	79 (96.3)	

The presence of bacterial vaginosis was significantly more among with <33 weeks gestational age as compared to 33 to 37 weeks gestational age (p=0.004).

Table 6: Association of SES with the presence of bacterial vaginosis (N=225)

SES	Bacterial vaginosis, n (%)		p-value
	Present	Absent	
APL	14 (7.6)	171 (92.4)	0.001
BPL	13 (32.5)	27 (67.5)	

The presence of bacterial vaginosis was significantly more among BPL as compared to APL (p=0.001).

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Table 7: Association of parity with the presence of bacterial vaginosis (N=225)

Parity	Bacterial vaginosis, n (%)		p-value
	Present	Absent	
Primi	2 (4.7)	41 (95.3)	0.099
Multi	25 (13.7)	157 (86.3)	

There was no association between the presence of bacterial vaginosis and parity (p=0.099).

Discussion

Our study showed that the mean (SD) age of the patients admitted with preterm labour was 28.1 (4.05) with a minimum of 18 years and a maximum of 38 years. Also, the mean age of the patients with bacterial vaginosis was significantly lesser than those without bacterial vaginosis. Similar findings were reported in studies conducted in Nigeria [7] whereby women aged 21-30 were predominantly diagnosed to have BV as compared to other age groups. In comparison, a French population-based study reported maternal age of less than 20 years to be significantly associated with BV as compared to older women [8]. Others have reported the highest prevalence of BV among women aged more than 30 years [9]. The common finding in all these studies is that the age groups with the highest prevalence of BV are the most sexually active age group with the highest risk of pregnancies and STIs.

Our study showed that the prevalence of bacterial vaginosis among preterm patients was 12%. Many others have reported a higher prevalence of bacterial vaginosis in their studies. The mechanism by which bacterial vaginosis causes preterm birth is not known, but there is evidence that it causes infection of the upper genital tract, which in turn causes premature birth.

Literature shows that bacterial vaginosis has been associated with two-to threefold increases in infection of amniotic fluid, infection of the chorion and amnion, and histologic chorioamnionitis. Pregnant women with bacterial vaginosis have elevated vaginal or cervical levels of cytokines suggesting that microorganisms that cause bacterial vaginosis stimulate the production of cytokines. It is noteworthy that the presence of vaginal lactobacilli appeared to protect against preterm delivery. However, there is a relative reduction in the number of vaginal lactobacilli is seen in BV. These results are further supported by the study by Pruwar *et al.* [10] where the prevalence of bacterial vaginosis was lesser among the normal term delivery when compared to the preterm deliveries. Even the studies by Goval *et al.* [11] and McGregor *et al.* [12] had shown that the incidence of bacterial vaginosis was significantly higher among the preterm deliveries when compared to the normal term deliveries. Thus, these are well supported by the studies conducted elsewhere. It is also noteworthy to mention that the prevalence of bacterial vaginosis among the preterm labour was relatively lower in our studies which could have been due to lower sample size, methods used for diagnosis coupled with lesser number of lower socio-economic (independent predictor of vaginal infections) pregnant women in our study (17.8%). This is also supported by our study findings where the presence of bacterial vaginosis was significantly more among BPL as compared to APL.

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Our study showed the presence of bacterial vaginosis was significantly more among with <33 weeks gestational age as compared to 33 to 37 weeks gestational age. Similar findings were reported in studies conducted by Gravett *et al*. [13], Kekki *et al*. [14].
Hay *et al*. [15] studied 718 pregnant women and found that women developing Bacterial Vaginosis after 16 weeks of gestation were less common and if present, it remits spontaneously in approximately half of those who reached term.

Conclusion

- Prevalence of bacterial vaginosis among patients with preterm labour was 12%.
- Prevalence of puerperal sepsis was 2.7%.
- There was no association between the gestational age group and birth weight.
- Mean age of the patients with bacterial vaginosis was significantly lesser than those without bacterial vaginosis.
- Presence of bacterial vaginosis was significantly more among with <33 weeks gestational age as compared to 33 to 37 weeks gestational age.

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