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Original research article

THE ASSOCIATION OF BACTERIAL VAGINOSIS WITH PUERPERAL SEPSIS AND LOW BIRTH WEIGHT NEONATES AMONG WOMEN WITH PRETERM LABOUR

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Abstract

Bacterial Vaginosis is a polymicrobial condition characterized by an altered vaginal flora where there is gross decrease in the Lactobacilli especially hydrogen peroxide producing strains and an excessive growth of anaerobes. Here mixed predominantly anaerobic flora replaces the normal Lactobacilli dominated flora. There is an increase in anaerobes and a decrease in the vaginal lactic acid content associated with an increase in vaginal pH > 4.5. The concentration of bacteria increases 100 to 1000-fold. A hospital-based cross-sectional study was conducted among the patients admitted with preterm labour. 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. The presence of bacterial vaginosis was significantly more among the normal baby weight group (p=0.001). The presence of puerperal sepsis was significantly more among those with bacterial vaginosis than those without bacterial vaginosis (p=0.002).

Keywords: Bacterial vaginosis, puerperal sepsis, low birth weight

Introduction

The incidence of Preterm labour varies in various studies as reported by different authors. According to the National health portal of India, across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born. In India, 3.5 million babies born are premature out of 27 million babies born every year (2010 data) [1].

In the USA and other developed countries incidence of preterm labour is between 7 to 9%.

BV is the cause of vaginitis in 10-30% of pregnant women. In pregnant women, BV is associated with the presence of fetal fibronectin. The microorganisms found in BV are also commonly found in the amniotic fluid of women with amniotic fluid infection. BV has been associated with preterm birth. It is postulated that bacteria, from whatever source, set up an inflammatory reaction in the fetal membranes leading to the cascade

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of events culminating in preterm delivery [2].

Bacterial Vaginosis is a polymicrobial condition characterized by an altered vaginal flora where there is gross decrease in the Lactobacilli especially hydrogen peroxide producing strains and an excessive growth of anaerobes.

Here mixed predominantly anaerobic flora replaces the normal Lactobacilli dominated flora. There is an increase in anaerobes and a decrease in the vaginal lactic acid content associated with an increase in vaginal pH > 4.5. The concentration of bacteria increases 100 to 1000-fold [3].

Bacterial vaginosis is not a notifiable disease hence exact prevalence data is lacking. Given the lack of precise diagnostic tests it is not surprising that estimates of disease prevalence have varied from study to study.

BV is a disease of women of the reproductive age group. It is more common in IUCD users, women with increased frequency of coitus, and in women with an increased number of sexual partners.

Many factors have been related to changes in the vaginal flora including menstruation, concomitant infections, sexual activity, number of sexual partners, contraceptive methods, and abnormal uterine bleeding [4].

Whether BV is a sexually transmitted disease is unresolved. Epidemiology of BV has some of the characteristics of an STD, is associated with increasing age and the presence of N. gonorrhea and Chlamydia trachomatis.

The literature provides evidence supporting for and against the sexual transmission of the disease.

Factors in favour of bacterial vaginosis: Age, history of previous genital infection, number of sexual partners. Male partners of women with bacterial vaginosis have an increased rate of G. vaginalis and anaerobes isolated from the urethra than controls.

The prevalence of bacterial vaginosis is varied in the obstetric population and ranges from 4 to 64% [5].

Hormonal factors may also play a role in the pathogenesis of bacterial vaginosis because it is a condition affecting mainly women of the reproductive age. It is more common with the use of non-barrier contraceptive methods especially IUCD [6].

Methodology

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.

Sample size was estimated using the following formula

$N=Z2PQ/E2$

Where

P = Proportion of bacterial vaginosis = 30% Q = 100-P = 70%

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Z2 for 95% significance level = 3.84
E = Absolute precision (20% of P) = 6%
N = 3.84*30*70/6*6
= 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.

Study population
Patients admitted with preterm labour.

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

Exclusion criteria
Patients with:
- Multiple gestations.
- Cervical cerclage.
- Current use of corticosteroids.
- PPROM.
- Patients who are not willing to participate in this study.

Results

Table 1: Distribution of patients with preterm labour to age group (N=225)

Age group	n (%)
< 20 years	3 (1.3)
20 to 34 years	211 (93.8)
35 years and above	11 (4.9)

That majority of the patients belonged to the age group of 20 to 34 years followed by 35 years and above.

Table 2: Distribution of patients according to the residence (N=225)

Residence	n (%)
Urban	187 (83.1)
Rural	38 (16.9)

Table 3: Distribution of patients according to the socio-economic status (N=225)

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Socio-economic status	n (%)
APL	185 (82.2)
BPL	40 (17.8)

That out of all participants presented with preterm labour majority of the patients belonged to the APL category of socio-economic classes.

Table 4: Distribution of patients according to the gestational age (N=225)

Gestational age	n (%)
< 33 weeks	143 (63.6)
33 to 37 weeks	82 (36.4)

The majority of the patients had their gestational age of <33 weeks.

Table 5: Distribution of patients according to the parity (N=225)

Parity	n (%)
Primigravida	43 (19.1)
Multigravida	182 (80.9)

Majority of the patients were multipara.

Table 6: Distribution of patients according to the birth weight of the baby (N=225)

Birth weight of the baby	n (%)
SGA	18 (18.0)
Normal	192 (85.3)
LGA	15 (6.7)

Majority of the patients in preterm labour had the birth weight of their baby normal followed by SGA.

Table 7: Association of birth weight of baby with the presence of bacterial vaginosis (N=225)

Birth weight	Bacterial vaginosis, n (%)		p-value
	Present	Absent	
SGA	9 (50.0)	9 (50.0)	0.001
Normal	14 (7.3)	178 (92.7)	
LGA	4 (26.7)	11 (73.3)	

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The presence of bacterial vaginosis was significantly more among the normal baby weight group (p=0.001).

Table 8: Association of puerperal sepsis with the presence of bacterial vaginosis (N=225)

Puerperal sepsis	Bacterial vaginosis, n (%)		p-value
	Present	Absent	
Present	4 (66.7)	2 (33.3)	0.002
Absent	23 (10.5)	196 (89.5)	

The presence of puerperal sepsis was significantly more among those with bacterial vaginosis than those without bacterial vaginosis (p=0.002).

Discussion

Our study showed that babies of patients with bacterial vaginosis were significantly more among the normal baby weight group. This finding might be because our sample size was small compared to other studies.

Our study showed that the presence of bacterial vaginosis was significantly more among those with puerperal sepsis than those without puerperal sepsis. A similar finding was reported in the study conducted by Leitich H *et al*. [7].

Tebes CC *et al*. [8] conducted a review of studies from 1994 to 2001 on the effect of treating bacterial vaginosis on preterm labour. Several trials discovered a decrease in the incidence of preterm labour when BV was treated, but many of those trials were performed on women with a history of preterm labour.

Subburaj L *et al*. [9] conducted a cross-sectional study among 106 pregnant women to evaluate the prevalence and impact of bacterial vaginosis among pregnant women. The prevalence of Bacterial vaginosis was 16.04%. There was a statistically significant association between preterm labour and Bacterial Vaginosis.

In 2014 in Baghdad Ali MA *et al*. [10] conducted a study to assess the prevalence of bacterial vaginosis in preterm labour. Bacterial vaginosis prevalence was more in patients with preterm labour (32%) in comparison with patients with term labour. Prevalence of Bacterial vaginosis in preterm labour was about three times higher than that among term labour.

In 2016 in Nigeria Aduloju OP *et al*. [11] conducted a study to determine the prevalence of BV and outcome of delivery among 362 pregnant women. The prevalence of BV was 16.6%. Women with bacterial vaginosis significantly had preterm rupture of membrane and their babies were born prematurely with low birth weight

In Paris a study by Goffinet F *et al*. (50), of 354 women tested, 254 was found to have normal flora (72.3%), 76 had intermediate (21.7%) and 24 BV (6.8%). The highest risk of very preterm delivery was associated with BV.

In 2012 Uganda Mulago hospital Nakubulwa S *et al*. [12] conducted a study to determine the association of common genital infections and premature rupture of membranes. There was an association between PROM and abnormal vaginal discharge and the presence of candidiasis, T. vaginalis.

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Conclusion

- Presence of bacterial vaginosis was significantly more among the normal baby weight group.
- Presence of puerperal sepsis was significantly more among those with bacterial vaginosis than those without bacterial vaginosis.

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