

International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2023; 7(2): 24-27
Received: 01-01-2023
Accepted: 04-02-2023

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Association of bacterial vaginosis with preterm labour

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DOI: <https://doi.org/10.33545/gynae.2023.v7.i2a.1282>

Abstract

Background: Bacterial vaginosis is one of the most common presentation of women in their reproductive age group. Its prevalence is relatively high in the obstetric population which is mostly responsible for preterm delivery.

Objective: To study association of preterm labour with bacterial vaginosis.

Materials and Methods: This was a cross sectional study of 114 pregnant women attending department of obstetrics and gynaecology for a period of 6 months at Maharajahs Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh.

Each woman after relevant history, investigations and examinations were studied for the presence of bacterial vaginosis (BV) based on Amsel's criteria and followed up for birth weight of the neonates, neonatal admission in neonatal intensive care unit (NICU), neonatal complications and postpartum complications.

Results: The mean maternal age and gestational age were 24.01 ± 3.426 years and 31.658 ± 1.709 weeks respectively. The proportion of patients who were diagnosed to have bacterial vaginosis according to Amsel's criteria was 28.9%. Out of 81 BV negative women, there were 14 (17.2%) preterm deliveries compared to 67 (82.7%) term deliveries. However, out of 33 BV positive women, there were 26 (78.78%) preterm deliveries and 7 (2.21%) term deliveries. Highly significant with p value < 0.00001 . In the study, 84.8% of neonates born to BV positive mothers had low birth weight as compared to 65.4% of neonates born to BV negative mothers. NICU admission in BV positive patients was 48.48% as compared to 38.2% in BV negative patient. However, 30.3% of neonates born to BV positive mothers had neonatal complications as compared to 16.04% of neonates born to BV negative mothers. Similarly, 42.42% of patients who were BV positive had postpartum complications as compared to 18.5% of patients who were BV negative.

Conclusion: The association of bacterial vaginosis with preterm labour is quite frequent and it can be suggested that all symptomatic cases and those having risk factors for preterm labour should be screened for bacterial vaginosis.

Keywords: Bacterial vaginosis, preterm labour, Amsel's criteria

Introduction

The vaginal ecology changes in bacterial vaginosis, which is characterised by the replacement of the lactobacilli-dominated normal flora with a mixed bacterial flora that includes Gardnerella vaginalis, Mobiluncus species, Mycoplasma hominis, Bacteroides species, and other anaerobes [1].

The most frequent cause of vaginal discharge in women of reproductive age is still bacterial vaginosis, which is also linked to premature birth, increased susceptibility to STIs, and HIV. [2] Bacterial vaginosis is a condition in which the number of lactobacilli decreases, and anaerobic and other bacteria overgrow in the vagina. Bacterial vaginosis has been connected to premature births in both case-control and prospective studies. [2]

There are numerous symptoms associated with bacterial vaginosis, or none at all. Up to 50% of women who have bacterial vaginosis may not exhibit any symptoms [3]. The two classic symptoms of bacterial vaginosis: vaginal discharge and fishy odour.

According to numerous research, the prevalence of bacterial vaginosis among pregnant women is between 6-32%. Many pregnancy complications, such as spontaneous abortion, preterm labour and delivery, premature rupture of the membranes, chorioamnionitis, postpartum endometritis and post caesarean wound infection, placental infection, and PID, are caused by an ascending uterine infection from the lower genital tract caused by bacterial vaginosis. [4-7].

Bacterial vaginosis can be diagnosed by simple clinical and rapid inexpensive diagnostic tests: Amsel's criteria and Nugent score [8,9].

Metronidazole is the drug of choice in the treatment of Bacterial vaginosis [10, 11].

Clindamycin is an effective alternative to metronidazole for treating anaerobic bacteria and *G. vaginalis* when taken orally. [12].

Clindamycin creams, gels, and ovules have also been discovered to be efficacious when administered intravaginally. [13-17].

The present study was designed to see the association of bacterial vaginosis with preterm labour and to analyse maternal and fetal complications associated with bacterial vaginosis.

Methodology

It was a prospective cross-sectional study of 114 pregnant women attending Obstetrics and Gynaecology department of Maharajahs institute of medical sciences, Nellimarla, Vizianagaram for a period of 6months.

Inclusion criteria: pregnant women with abnormal vaginal discharge and clinically suspected bacterial vaginosis.

Exclusion criteria

Cervical incompetence, cervical surgery, placenta previa, abruptio placenta, uterine abnormality, multiple pregnancy, polyhydramnios, Rh isoimmunization, use of antibiotics in the preceding two weeks, medical disorders like hypertension, diabetes, renal disorders, thyroid disorders, cardiac disorders etc., patients who were not willing to give consent.

Specimen collection

To avoid contamination with cervical mucus, a vaginal swab was obtained from the lateral vaginal wall or posterior fornix using a sterile vaginal speculum.

The following diagnostic criteria were used when examining vaginal swabs: 1) Vaginal discharge's appearance: Bacterial vaginosis can be identified by a homogeneous, thin vaginal discharge that adheres to the vaginal wall. 2) Vaginal fluid pH: Cardinal pH indicator strips were used to measure the vaginal fluid ph. Vaginal pH > 4.5 is elevated and indicative of bacterial vaginosis. 3) Clue cells by wet mount preparation: A saline wet mount preparation of vaginal disc here is examined under a microscope. In order to check for the presence of clue cells, pus cells, epithelial cells, *Trichomonas vaginalis*/*Candida*, a drop of discharge was mixed with a drop of normal saline on a glass slide, covered with a clean cover slip, and studied under a high power. 4) Use 2–3 drops of 10% potassium for the Whiff Test.

Puerperal difficulties of the mother after delivery, the baby's birth weight, the number of neonatal intensive care unit (NICU) admissions, etc. were all tracked to determine the formational outcome.

Statistical analysis

Data was analysed using Microsoft excel, SPSS. following tools were used- a) Microsoft excel to prepare tables and charts, b) Pearson's Chi-square test to find out the significance of differences in the various categorical data, c) independent t-test to find mean.

Results

During the study period of 6 months, total number of pregnant women subjected for bacteriological examination according to Amsel's criteria for diagnosis of bacterial vaginosis were 114.

Among the study group of 114 women, 64 of them had term deliveries and 40 of them had preterm deliveries.

Table 1 compares the study subjects in terms of their age, parity, gestational age and socio-economic status. The majority of people who had preterm deliveries were in the age group 20- 30 years. Majority of the people who had preterm delivery were primiparous whereas in term deliveries were multiparous. Majority of the women who had preterm deliveries were belonging to lower class.

In this study, the mean maternal age and gestational age were 24.01±3.426 years and 31.658±1.709 weeks respectively.

Table 1: demographic characteristics of study women

Parameters	Number among preterm	Percentage	Number among term	Percentage
Age				
<20yrs	9	22.5%	18	24.3%
20-30yrs	29	72.5%	49	66.2%
>30yrs	2	5%	7	9.4%
Parity				
Primiparous	23	57.5%	34	45.9%
Multiparous	17	42.5%	41	55.4%
Gestational age (Wks.) during labour				
<37 wks.	40	-	-	-
37-40wks	-	-	64	-
>40wks	-	-	-	-
Socioeconomic class				
Class I	-	-	-	-
Class II	-	-	7	-
Class III	3	7.5%	16	25%
Class IV	5	12.5%	22	29.6%
Class V	32	80%	29	45.3%

Table 2 shows the proportion of patients who were diagnosed to have bacterial vaginosis according to Amsel criteria was 28.9%

Table 2: Diagnosis of bacterial vaginosis (BV) according to Amsel's criteria (n=100)

Criteria of bacterial vaginosis		Number
Type of discharge	No discharge	52
	White mucoid discharge	18
	White curdy discharge	11
	Greyish white discharge	33
Vaginal ph.	>7	42
	<7	72
Whiff test	Positive	31
	Negative	83
Clue cell	Present	18
	Absent	96
>=3criteria suggestive BV	present	33 (28.9%)
	Absent	81 (71.05%)

Table 3 shows effects of BV on preterm delivery. Out of 81 BV negative women, there were 14 (17.2%) preterm deliveries compared to 67 (82.7%) term deliveries. However, out of 33 BV positive women, there were 26 (78.78%) preterm deliveries and 7 (2.21%) term deliveries. Highly significant with p value <0.00001

Table 3: Association of bacterial vaginosis with delivery

Bacterial vaginosis	No. of Preterm deliveries	Percentage	No. of term deliveries	Percentage
Positive	26	78.78%	7	2.21%
Negative	14	17.2%	67	82.7%

Table 4 In this study, 84.8% of neonates born to BV positive

mothers had low birth weight as compared to 65.4% of neonates born to BV negative mothers.

NICU admission in BV positive patients was 48.48% as compared to 38.2% in BV negative patient. However, 30.3% of neonates born to BV positive mothers had neonatal complications as compared to 16.04% of neonates born to BV negative mothers.

Similarly, 42.42% of patients who were BV positive had postpartum complications as compared to 18.5% of patients who were BV negative.

Table 4: maternal and fatal complications

Complications		BV positive	BV negative
		N=33	N=81
Birth weight	Low birth weight	28 (84.8%)	53(65.4%)
	Normal birth weight	5(15.1%)	28(34.5%)
Nico admission	Yes	16(48.48%)	31(38.2%)
	No	17(51.51%)	50(61.7%)
Neonatal complications	Absent	23(69.69%)	68(83.9%)
	Present	10(30.3%)	13(16.04%)
Postpartum complications	Absent	19(57.57%)	66(81.4%)
	Present	14(42.42%)	15(18.5%)

Discussion

Bacterial vaginosis is one of the most common presentations in women of reproductive age attending gynaecology outpatient department. The relatively higher prevalence of bacterial vaginosis in the obstetric population has been held responsible for the higher incidence of preterm delivery which could be reduced by screening and treating the condition^[18].

The vaginal flora during pregnancy is notable for an increase in lactobacilli which along with other bacteria helps to maintain the acidity of vagina through the production of lactic acid. Thus, this low pH encourages further growth of lactobacilli and other acidophilic organism and helps to prevent overgrowth with more pathogenic bacteria^[19].

This physiological alteration of flora during pregnancy may serve to protect the fetus which becomes progressively more benign during pregnancy. Alterations of this normal vaginal environment can lead to adverse outcome of pregnancy^[20].

In this study, the mean maternal age group was 24.01±3.426 yrs. Ali j *et al.* 2016^[21], TR Das *et al.*, Aruna *et al.* 2007^[22] and Chawanpaiboon *et al.* 2010^[23] in their study found the mean maternal age of 23.7, 24.59, 23.8 years and 26.7 years respectively.

The mean gestational age in our study was 31.658±1.876 wks. In the study conducted by Ali j *et al.*,^[21] Aruna *et al.*^[22] the mean gestational age was 31.7 weeks while Chawanpaiboon S *et al.*^[23] found the mean gestational age 33.6 weeks.

The preterm labour had a greater number of patients with low socioeconomic status (7.5%, 12.5%, 80% belonged to lower middle, upper middle and lower class) as compared to other studies. Aruna *et al.*, 2007, observed 52.27% of patients with preterm labour had low socioeconomic status. Lata *et al.* 2010^[25], found that the incidence of preterm deliveries was most common in lower socio-economic status.

Whiff test was positive in 36% of patients in preterm labour in other study Javed *et al* had 38% of patients in preterm labour where Chawanpaiboon *et al.*^[23] found Whiff test positive in 20% of patients in preterm labour.

Clue cells were detected in 17% of patients. Ali j *et al*^[21] had 14% of patients but Murad *et al.*^[24] stated that clue cells were one of the predictors for diagnosis of BV at the rate of 84%.

In the study, the number of patients who fulfilled Amsel's criteria were (28.9%). Ali j *et al.*,^[21] study no. of patients fulfilled Amsel's criteria were (28%). However, Aruna *et al.*^[22] and Chawanpaiboon *et al.*^[23] observed the ≥3 Amsel's criteria in 44% and 30% of preterm labour respectively.

In the present study, the prevalence of bacterial vaginosis was 28.9% among the preterm labour, Ali j *et al.*,^[21] observed the prevalence to be 28%. Nejad *et al.* 2008^[26] observed the prevalence to be 25%, Aruna *et al.*^[22], in their study, the prevalence was 44%.

In our study, 84.8% of neonates born to BV positive patient had low birth weight as compared to 65.4% among the BV negative Patient. In Ali j *et al.*,^[21] study, 94.44% of neonates born to BV negative patient had low birth weight as compared to 89.28% among the BV positive patient.

In this study, 30.3% of neonates born to mothers of BV positive patients had neonatal complications compared to 16.04% among the BV negative patients. In the study ali j *et al.*,^[21] 25% of neonates born to mothers of BV positive patients had neonatal complications as compared to 8.33% among the BV negative patients.

he postpartum complication was seen in 42.42% of patients with BV positive pregnant women. In the study conducted by Ali j *et al.*,^[21] 35.71% of patients with BV positive in preterm labour in comparison to 16.66% of patients with BV negative in preterm labour.

In this study no. of preterm deliveries occurred in positive bacterial vaginosis were 78.78% showing significant association between bacterial vaginosis with preterm labour.

Conclusion

According to this study, bacterial vaginosis and preterm labour frequently co-occur. Preterm births carry a heavy disease burden that must be treated aggressively because it affects even the progeny. BV during pregnancy should always be screened for, and treatment should be sought out if it is found.

Conflict of interest: None to declare.

Ethical issue: None

Source of Funding: None

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How to Cite This Article

Bharathi BU, Beghum SR. Association of bacterial vaginosis with preterm labour. *International Journal of Clinical Obstetrics and Gynaecology*. 2023;7(2):24-27.

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