RESEARCH ARTICLE

Association of bacterial vaginosis with preterm labour

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ABSTRACT

Objective: To study association of preterm labour with bacterial vaginosis and to analyze maternal and fetal complications associated with bacterial vaginosis. **Materials and Methods:** This was a cross sectional study of 100 pregnant women with preterm labour. 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 percentage of patients in preterm labour group who fulfilled 3 out of 4 Amsel's criteria was 28%. In preterm labour with bacterial vaginosis, 89.28% of neonates had low birth weight. Percentage of neonates requiring NICU admission, postpartum complications (postpartum hemorrhage and puerperal pyrexia) in preterm labour with bacterial vaginosis were 64.28%, 35.71% respectively. Neonatal complications like sepsis and respiratory distress syndrome (RDS) were significantly more in neonates born to BV positive mothers in preterm labour (p=0.432). **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.

Bacterial vaginosis is a condition characterized by an alteration of the vaginal ecology in which the normal flora, dominated by lactobacilli, is replaced by a mixed bacterial flora which includes *Gardnerella vaginalis*, *Mobiluncus species*, *Mycoplasma hominis*, *Bacteroides* species and other anaerobes [1]. Bacterial vaginosis may carry a variety of symptoms or none at all. As many as 50% of women with bacterial vaginosis may be asymptomatic [2]. The two classic symptoms of bacterial vaginosis: vaginal discharge and fishy odour prevalence of bacterial vaginosis among pregnant women varies from 6-32% in various studies. Ascending uterine infection from lower genital tract due to bacterial vaginosis has been implicated as an important causative factor for many pregnancy complications namely spontaneous abortion, preterm labour and delivery, premature rupture of membranes, chorioamnionitis, postpartum endometritis and postcaesarean wound infection [3-6]. Bacterial vaginosis can be diagnosed by simple clinical and rapid

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inexpensive diagnostic tests: Amsel's criteria and Nugent score [7,8]. Metronidazole is the drug of choice in the treatment of Bacterial vaginosis [9,10]. Oral clindamycin has significant effect against anaerobic bacteria and G. vaginalis and is a good alternative to metronidazole [11]. Intravaginal metronidazole, clindamycin creams, gels and ovules have also been found to be effective [12-16]. 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 cross sectional study of 100 pregnant women attending department of Obstetrics and Gynecology, in collaboration with Microbiology department, Gauhati Medical College and hospital, Guwahati over a period of one year (1st June 2013 to 31st May 2014).

Inclusion criteria were - women in preterm labour with or without any complain irrespective of age, parity with these findings – a) gestational age less than 37 weeks, b) regular uterine contractions (four or more in 20 minutes or eight or more in 60 minutes) each lasting more than 40 seconds, c) cervical dilatation equal to or greater than 1 cm but less than 4 cm, d) intact amniotic membranes. These women were screened for bacterial vaginosis after taking written informed consent.

Exclusion criteria were - 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.

Using a sterile vaginal speculum, vaginal swab was taken from the lateral vaginal wall or posterior fornix, avoiding contamination with cervical mucous. Vaginal swab was studied under the following diagnosing criteria: 1) Appearance of vaginal discharge: a homogeneous, thin vaginal fluid that adheres to the vaginal wall is diagnostic of bacterial vaginosis. 2) pH of vaginal fluid: pH of vagina was measured by using cardinal pH indicator strips. Elevated vaginal pH>4.5 is suggestive of bacterial vaginosis. 3) Clue cells by wet mount preparation: microscopic examination of a saline wet mount preparation of vaginal discharge is done. A drop of discharge was mixed with a drop of normal saline on a glass slide, covered with a clean cover slip and examined under a high power for the presence of clue cells, pus cells, epithelial cells, Trichomonas vaginalis/ Candida. 4) Whiff Test: 2 to 3 drops of 10% potassium hydroxide was added to the vaginal discharge on the speculum and sniffing the mixture. The test is interpreted as positive if a fishy odour is noted. Bacterial vaginosis was diagnosed if three or more of the criteria (Amsel's criteria) were present.

After delivery puerperal complications of mother, birth weight of the baby, number of neonatal intensive care (NICU) admission etc. were measured to observe the fetomaternal outcome. For statistical analysis, 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

In this study, the mean maternal age and gestational age were 23.710 ± 3.636 years and 31.787 ±1.909 weeks respectively. The socioeconomic status was found be lower in BV positive patients as compared to BV negative patients. The proportion of patients who were diagnosed to have bacterial vaginosis according to Amsel's criteria was 28%. In the study, 89.28% of neonates born to BV positive mothers had low birth weight as compared to 94.44% of neonates born to BV negative mothers (p=0.03963). NICU admission in BV positive patients was 64.28% as compared to 43.05% in BV negative patient (p=0.0751). However, 25%of neonates born to BV positive mothers had neonatal complications as compared to 8.33% of neonates born to BV negative mothers. This difference was significant statistically (p=0.0432). Similarly, 35.71% of patients who were BV positive had postpartum complicationsas compared to 16.66% of patients who

were BV negative which was not significant statistically (p=0.0584).

Table 1: Diagnosis of bacterial vaginosis (BV) according to Amsel's criteria (n=100)

Criterias of bacterial vaginosis		No (%)
Type of discharge	No discharge	40(40%)
	White mucoid discharge	22(22%)
	White curdy discharge	10(10%)
	Grayish white discharge	28(28%)
Vaginal pH	Basic	40(40%)
	Acidic	60(60%)
Whiff test	Positive	38(38%)
	Negative	62(62%)
Clue cell	Present	14(14%)
	Absent	86(86%)
≥3Criteria (Amsel's) Suggestive BV	Present	28(28%)
	Absent	72(72%)

Table 2: Maternal and fetal complications

Complications		BV Positive (n=28)	BV Negative (n=72)	P value
Birth weight	Low birth weight	25(89.28%)	68(94.44%)	0.03963
	Normal birth weight	3(10.71%)	4(5.56%)	
NICU admission	Yes	18 (64.28%)	31(43.05%)	0.0751
	No	10 (35.71%)	41(56.94%)	
Neonatal complications	Absent	21(75%)	66(91.66%)	0.0432
	Present	7(25%)	6(8.33%)	
Postpartum complications	Absent	18(64.28%)	60(83.33%)	0.0584
	Present	10(35.71%)	12(16.66%)	

Discussion

In the study, the mean maternal age group was 23.710 ± 3.636 yrs. Aruna et al.2007 [17] and Chawanpaiboon et al.2010 [18] in their study found the mean maternal age of 23.8 years and 26.7 years respectively. The mean gestational age in our study was 31.787±1.909 wks. In the study conducted by Aruna et al. [17] the mean gestational age was 31.7 weeks while Chawanpaiboon S et al. [18] found the mean gestational age 33.6 weeks. The preterm labourwith BV positive had more number of patients with low socioeconomic status (7.141%, 35.71%, 57.14% belonged to lower middle, upper lower and lower class respectively) as compared to BV negative patients (25%, 47.22%, 27.77% belonged to lower middle, upper lower and lower class respectively). Aruna et al 2007, observed 52.27% of patients with BV had low socioeconomic status. Lata et al.2010 [19], found that the incidence of bacterial vaginosis was most common in lower socio-economic status (*P*=0.0477). Kalemaj et al.2013 [20], in their study, observed that the women with low educational level presented a higher prevalence of BV when compared with women with higher educational level. In the present study, 40% of women had basic vaginal pH which is comparable with Murad et al.2009 [21] and Chawanpaiboon et al 2010 [18]. Whiff test was positive in 38% of patients in preterm labour where Chawanpaiboon et al. [18] found Whiff test positive in 20% of patients in preterm labour.

Clue cells were detected in 14% of patients but Murad et al. [21] stated that clue cells were one of the predictor for diagnosis of BV at the rate of 84%. Aruna et al [17] observed the sensitivity and specificity of clue cell to be 82.6% and 90.2% respectively. Chawanpaiboon et al. [18] observed clue cell in 30% of patients with preterm labour. In the study, the number of patients who fulfilled Amsel's criteria were (28%). However, Aruna et al. [17] and Chawanpaiboon et al. [18] 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% among the preterm labour, Nejad et al.2008 [22] observed the prevalence to be 25%, Aruna et al. [17], in their study, the prevalence was 44%. In the preterm group associated with BV, 64.28% of neonates required NICU admission. Roy et al. 2006 [23] observed 83.3% babies in ELBW group and 40% babies in VLBW group who needed ventilitary support immediately or in subsequent days in NICU. Laxmi et al. 2012 [24] observed that 15% of neonates with BV positive mothers required NICU admission. In our study, 94.44% of neonates born to BV negative patient had low birth weight as compared to 89.28% among the BV positive patient. Holst et al.1994 [5] observed

that BV was associated with low birth weight. Shilpa MN et al. 2013 [25] observed LBW in 90.9% of patients with BV while it was seen in 9.1% of patients without BV. In this study, 25% of neonates born to mothers of BV positive patients had neonatal complications as compared to 8.33% among the BV negative patients. Neonatal complications observed were RDS and sepsis. Roy et al.2006 [22], in their study of 92 patients in preterm labour had BV associated in 26% of cases. They observed neonatal complications like RDS, neonatal jaundice and sepsis. Laxmi et al 2012 [24] observed RDS in 14% of neonates born to patients with bacterial vaginosis.

The postpartum complication was seen in 35.71% of patients with BV positive in preterm labour in comparison to 16.66% of patients with BV negative in preterm labour. The complications observed in the present study were puerperal pyrexia and atonic PPH. Svare et al. 2006 [6], observed 0.6% of BV with endometritis. Lata et al. 2010 [19] observed puerperal pyrexia in 4.87% of patients with BV.

Conclusion

This study reveals the frequent association of bacterial vaginosis with preterm labour. Due to the fact that preterm deliveries represent significant burden of disease, even in the offspring, BV has to be treated intensively. A screening for BV during pregnancy is indispensable, and its treatment is logical and necessary.

Conflict of interest: None. **Disclaimer:** Nil.

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