Role of Bacterial Vaginosis in Patients with Idiopathic Pre-Term Labour.

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ABSTRACT

Background: To find out the correlation of bacterial vaginosis (BV) in idiopathic preterm labour and find its association with an adverse pregnancy outcome in patients with idiopathic preterm labour. **Methods:** This is a comparative study, comprising of 150 pregnant females in study group admitted with preterm labour without any obvious cause and 150 pregnant women with singleton pregnancy at term in the control group. Both the groups were tested for BV by using Amsel's criteria and Nugent's criteria. Diagnosis of BV was stamped based on gram staining of vaginal discharge smear. All patients were followed till delivery. **Results:** In the study group, significantly large number of women tested positive for BV on gram staining of vaginal discharge as compared to control group (20.6% vs 8.0%). In the study group, an adverse pregnancy outcome in the form of preterm delivery (<37 weeks) was noted in 93.4% women testing positive for BV and only in 47.9% women testing negative for BV. The majority of women with BV +ve were more likely to deliver before or at 34 weeks (58.06%) compared to women with BV-ve (14.28%).**Conclusion:** BV was significantly associated with preterm labour and preterm delivery and adverse perinatal outcomes.

Keywords: Bacterial vaginosis, preterm labour (PTL), preterm delivery.

INTRODUCTION

Bacterial Vaginosis (BV) is a polymicrobial disorder of the vaginal ecosystem characterized by a shift in the vaginal flora from the normally predominant Lactobacillus to one dominated by a mixed flora including Gardnerella vaginalis and Mobiluncus, Provotella, Bacteroides and Mycoplasma species[1]. Lactobacillus is a normal flora in the vagina that produces an acidic medium via hydrogen peroxide (H_2O_2), which transforms glycogen in vaginal epithelium to lactic acid. The acidic medium produced by Lactobacillus suppresses the growth of other micro-organisms[2]. Bacterial Vaginosis accounts for 40-50% cases[3]. The exact mechanism for the onset of bacterial vaginosis remains a mystery. It is associated with a reduction in Lactobacilli and Hydrogen peroxide production, a rise in the vaginal pH and the overgrowth of bacterial vaginosis associated organisms [Figure 1].

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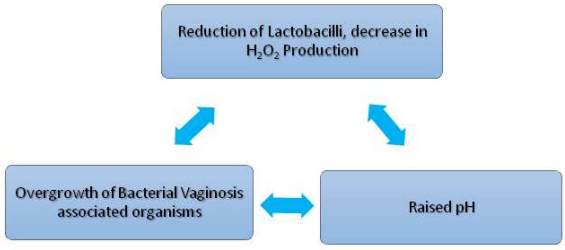

Figure 1:Associated changes with Bacterial Vaginosis

Pre-term labour (PTL) with subsequent delivery of a premature baby remains a major cause of perinatal morbidity and mortality in India. The aetiological factor responsible for PTL, is obscure in a large percentage of cases leading to an increased incidence of idiopathic PTL. Recently the lower genital tract infection especially the bacterial vaginosis, has been strongly suspected to be the offending agent in a number of serious obstetrics complications like preterm labour, preterm delivery, premature rupture of membranes (PROM), Low Birth weight (LBW), postpartum endometritis, postpartum sepsis, Lower segment Caesarean section (LSCS) and episiotomy wound infection. The widespread use of effective screening and treatment have the potential to significantly limit these adverse maternal and perinatal outcomes and reduce the health costs and economic burden associated with Bacterial Vaginosis suffering pregnant women. Therefore, the present study was undertaken to evaluate the role of Bacterial Vaginosis in idiopathic PTL and preterm delivery.

MATERIALS AND METHODS

The cross sectional study was performed on pregnant women attending OPD and those admitted in the Department of Obstetrics and Gynaecology, RMCH, Bareilly, Uttar Pradesh, India over a period of six months as per the selection criteria mentioned below.

Inclusion Criteria

- Singleton pregnancy.
- Gestational age between 28-36 weeks.
- Intact membranes.
- Painful uterine contractions > 2 in 10 min, each lasting for >45 sec.
- Cervical dilatation < 4 cm.
- Cervical effacement > 25%.

Exclusion Criteria

- Gestational Age < 28 weeks.
- History of APH (Ante Partum Haemorrhage).
- Congenital anomaly of uterus.
- Multiple pregnancy.
- Intrauterine foetal death.
- IUGR (Intra Uterine Growth Restriction).
- Women with chronic hypertension, pregnancy induced hypertension, diabetes mellitus, chronic heart disease, chronic renal disease, moderate to severe anaemia.
- Antibiotic therapy within 15 days of enrolment.
- History of leaking per vaginum or absent membranes.

The Study included 2 groups-

- **Study Group**- The study group included 150 women with preterm labour without any obvious cause for the same
- **Control Group**- 150 women carrying singleton pregnancy at term gestation are included in control group.

Detailed history was taken especially to include the history of previous abortion, pre-term delivery, still birth and neonatal death. A thorough general and systemic examination was done to exclude exclusion criteria. A detailed obstetrical examination was done to note the fundal height of the uterus, abdominal girth, presentation, uterine contractions (frequency, intensity and duration) and FHR. Speculum Examination was done to exclude leaking and bleeding per vaginum. Samples of vaginal discharge were taken and the diagnosis of bacterial vaginosis was made by using Amsel's criteria, and by gram staining of the vaginal discharge. Accurate clinical diagnosis was based on the presence of minimum three of the four clinical criteria described by Amsel et al.[4]

Amsel's criteria-

1. Thin homogenous white vaginal discharge.
2. Vaginal pH > 4.5.
3. Positive Whiff test (Amine test)-Offensive Amine odour when 10% KOH is added to the vaginal discharge.
4. Presence of clue cells (Vaginal Epithelial Cells with borders obscured by adherent coccobacilli on wet mount preparation or gram stain).

Diagnosis of BV was stamped on the basis of Nugent's Criteria[5] on Gram stain, which identified the various morphotypes as Lactobacillus type, Gardnerella and Bacteroides type, or the Mobiluncustype; and then quantified each type into Scores 0 to 4+ with regards to number of each Morphotype seen in Oil immersion under 1000X magnification [Table 1].

Table 1: Nugent's Scoring System.

Score Organism Morphotype Per High Power Field			
	Lactobacillus Type	**Gardnerella/Bacteroides Type**	**Mobiluncus type**
0	>30	0	0
1	5 -30	<1	1 – 5
2	1 - 4	1 - 4	>5
3	<1	5 – 30	
4	0	>30	

A Score of ≥7 indicates BV infection. All patients testing positive for BV were treated with oral Metronidazole 400 mg TDS for seven days; and followed to know the overall outcome of present episode, the outcome of pregnancy and the development of puerperal and neonatal complications.

Statistical analysis was done by using SPSS software, and the result was subjected to appropriate statistical analysis by employing tests like Chi-Square test & t-test.

RESULTS

Table 2: The association of adverse obstetric event in past.

Obstetric Problem in past	Study Group (n=150)	Control Group (n=150)	P-value

Abortion	19 (12.66%)	14 (14.66%)	0.62 <0.0001 extremely significant
Pre-Term delivery	23 (15.33%)	3 (2.66)	
Still Birth	2 (1.33%)	1 (1.33%)	
Infant Death/Neonatal Death	3 (2.0%)	2 (3.33%)	
Nil	103 (68.66%)	78 (78%)	

Table 3: Vaginal pH in Study and Control Group

pH	Study Group (n=150)	Control Group (n=150)	p-value
< 4.5	58 (38.67%)	104 (69.33%)	< 0.00001 extremely significant
> 4.5	92 (61.33%)	46 (30.66%)	

Table 4: Whiff test & Gram Stain in Study & Control Group

Whiff test	Study Group (n=150)	Control Value (n=150)	
+ve	52 (34.67%)	28 (18.66%)	OR= 2.9958 95% Cl (1.4728 – 6.0938)
-ve	98 (65.33%)	122 (81.33%)	
Gram Stain			
+ve	31 (20.67%)	12 (8.0%)	
-ve	119 (79.33%)	138 (92.0%)	

Table 5: Gestational Age at onset of preterm labour in the Study Group.

Gest Age (in wks)	BV + ve (n=31)	BV –ve (n=119)	p-value
29-31	11 (35.48%)	39 (32.77%)	0.5002 N.S
32-34	14 (45.16%)	48 (40.33%)	
35-37	6 (19.35%)	32 (26.89%)	
Mean ± S.D	32wks4d ± 2wks5d	32wks5d ± 2wks6d	

The study and control groups were statistically compared with respect to age, parity and socio-economic status. The majority of women in both groups were of age group 26-32 years and majority of them belonged to low socio-economic status. In majority of women, parity was ≥P3

Table 6: Outcome of BV +ve & -ve patient admitted with pre-term labour.

GA at delivery	BV +ve (n=31)	BV –ve (n=119)	p-value
≤ 34 wks	18 (58.06%)	17 (14.28%)	<0.00001 extremely significant
35 -37 wks	11 (35.48%)	40 (33.61%)	
> 37 wks	2 (6.45%)	60 (50.42%)	
Lost to follow up	0	2 (1.68%)	

[Table 2]- In study group, 15.33% females had a history of previous pre-term deliveries as compared to control group (2.66%) which was found to be significantly associated with risk of pre-term labour, in the present study ($p < 0.0001$). Other past adverse obstetric events were found to be statistically insignificant in both groups.

[Table 3]- Shows that in 92 (61.33%) women on the study group pH value of vaginal discharge were >4.5 as compared to that in 46 (30.66%) females in the control group. This was statistically significant ($p < 0.00001$). pH value was <4.5 in 38.67% women in the study group and in 69.33% women in the control group.

[Table 4]- Whiff test was positive in larger no. of women (34.67%) as compared to that in the control group (18.66%). It also shows that higher number of women in study group tested positive for bacterial vaginosis on gram stain (20.67%) as compared to control group (8.0%), (OR=2. 9958, 95% CI 1.47-6.09)

[Table 5]- Show the analysis of gestational age at onset of pre-term labour in bacterial vaginosis positive and bacterial vaginosis negative cases in the study group. In maximum no. of women (45.16%) in bacterial vaginosis positive group, the gestational age at onset of pre-term labour was 32-34 weeks. The distribution was almost similar in both the groups as was the mean gestational age at presentation.

[Table 6]- Shows that larger no. of bacterial vaginosis positive women in the study group delivered pre-term as compared to bacterial vaginosis negative cases (93.54% vs 47.89%). It was also found that in bacterial vaginosis positive group about 58.06% women were delivered very pre-term i.e. before 34 weeks of gestational age as compared bacterial vaginosis negative cases (14.28%). The result was statistically very significant ($p < 0.00001$).

DISCUSSION

Bacterial vaginosis is a very common condition characterised by alterations of the vaginal flora with acquisition of diverse communities of anaerobic and facultative bacteria and depletion of the usually dominant Lactobacillus flora (Sobel,2005)[6]. Accurate diagnosis of BV is important as it is associated with adverse pregnancy outcome (Myziuk et al.,2003)[1].

In present study BV was significantly associated with preterm labour (p value-0.00001).In a similar study performed by Kurki et al.[7], bacterial vaginosis was associated with 2.6 times increased risk for preterm labour, 6.9 times increased risk for preterm delivery and 7.3 fold risk for preterm PROM. Sheehan et al. 1996, in their study on BV concluded that the occurrence of BV in early pregnancy led to 5-fold increased risk of late miscarriage or preterm delivery. In current study,

BV was more common in the low socioeconomic status. Rauh VA et al.[8],in his study also found higher prevalence of bacterial vaginosis in low socioeconomic status.

A history of prior preterm delivery has been associated with a 2 to 6 fold risk of recurrence of preterm delivery[9,10]. Also in the present study, a significantly higher frequency of previous preterm delivery was found among PTD women than among controls (p <0.0001). Other studies have also reported a similar association[10-12]. In the present study, number of BV +ve subjects of the study group delivered preterm as compared to BV- the subjects. It was also found that BV+ve subjects were more likely to deliver very preterm i.e., <34 wks as compared to BV-ve (p-0.00001). Similar results have been reported by other workers[10-13]. The positive case in the control group had been given treatment for BV.

Today, metronidazole is generally accepted as the drug of choice for treatment of BV[14]. Since metronidazole is contraindicated in the first trimester because of a possible teratogenic effect, amoxicillin, although less effective than metronidazole has been given as an alternative treatment in women during this time period of the pregnancy.[15] Also, cefadroxil might be an alternative therapy against BV in pregnant women.[16]

CONCLUSION

Bacterial vaginosis is associated with PTL, PROM and PTD. It is also associated with poor pregnancy outcome in the form of the LWB, postpartum endometritis, postpartum sepsis, and postpartum wound infection. It is even more strongly associated with very preterm delivery (<34wks). The true magnitude of BV is not known as more than half of cases are asymptomatic. Therefore, during prenatal care standard practice should be applied for screening of BV in patients with high risk for preterm labour and preterm delivery. Infections and altered vaginal flora are modifiable risk factors that can be curtailed. Hence, health care providers should monitor even asymptomatic pregnant women for BV and other cervicovaginal infections and prescribe appropriate antibiotics to reduce the burden of maternal and foetal morbidity.

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REFERENCES

1. Myziuk L,Romanowski B, Johnson SC.BV Blue test for diagnosis of bacterial vaginosis. J Clin Microbiol. 2003; 41: 1925-8.
2. Klebanoff SJ, Hillier SL, Eschelbach DA, Waltersdorph AM. Control of the microbial flora of the vagina by H2O2-generating lactobacilli. J Infect Dis. 1991; 164: 94-100.
3. Chowdhury MMH. Gardnerella vaginalis associated vaginitis: a review. Trop Geogr Med. 1986; 138: 113-125.
4. Amsel R,Totten PA, Spiegel CA, Chen KC, Eschenbach D, Holmes KK. Nonspecific vaginitis:Diagnostic criteria and epidemiologic associations. Am J Med. 1983; 74 (1): 14-22.
5. Nugent RP, Krohn MA, Hillier SL. Reliability of diagnosing bacterial vaginosis is improved by a standardised method of gram stain interpretation. J Clin Microbiol. 1991; 29(2): 297-301.
6. Sobel JD. What's new in bacterial vaginosis and trichomoniasis? Infect. Dis. Clin. N. Am. 2005; 19: 387-406.
7. Kurki T, Sivonen A, Renkonen OV et al .Bacterial vaginosis in early pregnancy and pregnancy outcome . Obstet Gynecol. 1992; 80 (2): 173-177.
8. Rauh VA, Culhane JF, Hogan VK. Bacterial vaginosis: a public health problem for women. J. Am. Med Women Assoc. 2000; 55: 220-222.
9. Martius J, Krons MA, Hillier SJ, Stamm WF, Holmes KK, Eschenbach DA. Relationship of vaginal Lactobacillus species, cervical Chlamydia trachomatis and bacterial vaginosis to preterm birth. Obstet Gynecol. 1988; 71: 89-95.
10. McGregor JA, French JI, Richter R et al. Antenatal microbiologic and maternal risk factors associated with prematurity. Am. J.Obstet Gynecol. 1990; 163: 1465-73.
11. McDonald HM, O' Loughlin JA, Jolley P et al. Prenatal microbiological risk factors associated with preterm birth. Br. J. Obstet Gynecol. 1992; 99: 190-196.
12. Holst F, Goffeng AR, Andersch B. Bacterial vaginosis and vaginal microorganisms in idiopathic preterm labour and association with pregnancy outcome. J Clin Microbiol. 1994; 32: 176-86.
13. Sangeeta, Mittal A, Chadra P et al. Incidence of Gardnerella vaginalis in preterm labour. Obstet Gynecol Today. 1999; 4: 299-303.
14. McDonald HM, O' Loughlin JA, Vigneswaran R et al. Bacterial vaginosis in pregnancy and efficacy of short course oral metronidazole treatment. A randomised controlled trial. Obstet Gynecol. 1994; 84:343-8.
15. Duff P, ML Lee, SL Hillier, LM Herd, MA Kronhs, D Eschenbach. Amoxycillin treatment of bacterial vaginosis during pregnancy. Obstet Gynecol. 1991; 77: 431-435.
16. Wathne B, Holst E, Hovelius B. Cefadroxil as an alternative to metronidazole in the treatment of bacterial vaginosis. Scand. J. Infect. Dis. 1989; 21: 585-586.

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