

Original Article

Bacterial vaginosis in patients with idiopathic preterm labor

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Abstract

Objectives: To find the incidence of bacterial vaginosis (BV) in idiopathic preterm labor and check its association with an adverse outcome in patients of idiopathic preterm labor. **Methods:** This is a comparative study, with the study group comprising 75 pregnant women admitted with preterm labor, without any obvious cause i.e. idiopathic preterm labor and a control group consisting of 75 pregnant women carrying singleton pregnancy to term. Both the controls and subjects were tested for BV by gram stained vaginal smear. All patients were followed till delivery. **Results:** Significantly more number of women in the study group tested positive for BV on gram stain of vaginal discharge as compared to the control group (18.7% vs 80%). In the study group, an adverse outcome in the form of preterm delivery (<37 weeks) was noted in 92.9% women testing positive for BV and only in 49.3% of the women testing negative for BV. Also, women with BV were more likely to deliver before 34 weeks (57.1% vs 14.8%). **Conclusions:** BV infection is commonly seen in patients of idiopathic preterm labor. Presence of BV in women admitted with idiopathic preterm labor is associated with preterm delivery. It is even more strongly associated with very preterm delivery (i.e. < 34 weeks).

Key words : bacterial vaginosis, preterm labor

Introduction

Pre-term labor (PTL) with subsequent delivery of a premature baby remains a major cause of perinatal morbidity and mortality in India. The etiological factor responsible for PTL is obscure in large percentage of cases leading to an increased incidence of idiopathic PTL. Recently the lower genital tract infection especially bacterial vaginosis (BV), has been strongly suspected

to be the offending agent in hitherto idiopathic cases of PTL.

In India, 10-12% of the pregnancies present with PTL, but few Indian studies have checked the association of BV with PTL¹ and preterm delivery. So the present study was undertaken to study the association of BV with idiopathic PTL and preterm delivery.

Method

The study was carried out from March 2004 to July 2005 involving 150 women admitted with idiopathic PTL as per the selection criteria mentioned below:

Inclusion criteria

1. Singleton pregnancy

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2. Gestational age between 28-36 weeks
3. Intact membranes
4. Painful uterine contractions >2 in 10 minutes, each lasting >45 seconds
5. Cervical dilatation between 1 to 4 cm
6. Cervical effacement >25%

Exclusion criteria:

1. Gestational age <28 weeks
2. History of antepartum hemorrhage, urinary tract infections, respiratory tract infections, diarrhea or any other obvious cause for preterm labor.
3. Medical complications of pregnancy such as moderate to severe anemia, pregnancy induced hypertension, and diabetes mellitus.
4. History of leaking per vaginum or absent membranes
5. Multiple pregnancy
6. Intrauterine growth restriction
7. Intrauterine fetal death
8. Antibiotic therapy in the last 30 days.

The study group included 75 women with PTL without any obvious cause for the same. Control group included 75 women carrying singleton pregnancy at term gestation. Detailed history was taken especially to include history of previous abortion, preterm delivery, stillbirth 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, abdominal girth, presentation, uterine contractions (intensity, frequency and duration), and fetal heart pattern and rate. Speculum examination was done to exclude leaking and to note the type of discharge which was collected for the pH estimation, amine testing and for making a smear for gram staining. Vaginal examination was also done to note the dilatation and effacement of cervix and to confirm the presence of membranes.

Vaginal discharge was tested for pH using the strip method. Amine test was done by addition of 10% KOH to the vaginal discharge and noting the emission of an offensive amine like odor which indicated a positive amine test. A smear was made for gram stain for clue cells. Diagnosis of BV was stamped on the basis of Nugent's criteria on gram stain which identified the various morphotypes as lactobacillus type, Gardnerella vaginalis and bacteroides type or the mobiluncus types

and then quantified each morphotype into score 0 to 4+ based on the number of each morphotype seen in oil immersion under x 1000 magnification. The final Nugent's score was given as follows:

Score	Lactobacillus morphotype	G. vaginalis and bacteroides morphotypes	Mobiluncus morphotype
0	4+	0	0
1	3+	1+	1+ or 2+
2	2+	2+	3+ or 4+
3	1+	3+	
4	0	4+	

The patients were given hydration, sedation and intravenous infusion of ritodrine in standard dose for tocolysis and were switched to oral tocolytics after cessation of contractions for 12 hours. The ritodrine infusion was discontinued if contractions persisted after 2 hours despite maximum doses of ritodrine or if labor progressed. The following adverse effects were noted: maternal tachycardia >120/minute or systolic BP <100mm Hg.

All patients testing positive for BV were treated with oral metronidazole 500mg twice daily for 5 days and followed to know the outcome of the present episode, any future episodes of PTL, outcome of pregnancy, and development of puerperal and neonatal complications.

Statistical analysis was done using IP-6 software and standard tests for significance i.e. p-value. Odds ratio and confidence interval using were EP Info-6 software were used to analyze significance.

Results

The study and control groups were statistically comparable with respect to age, parity and socio-economic status.

As seen in table 1, previous preterm delivery was found to be significantly associated with risk of PTL in the present pregnancy (p<0.5). Other studies have also reported a similar association²⁻⁴.

Table 2 shows that the mean pH value of vaginal discharge was significantly higher in the study group (4.48±0.72) as compared to that in the control group (3.95±0.66) (p<0.01). Similarly amine test was positive

Table 1. Associated past adverse obstetric event.

Adverse obstetric event in the past	Study group (n=75)	Control group (n=75)	P value
Abortion	09 (12.1%)	11 (14.9%)	0.8
Previous preterm delivery	11 (14.9%)	02 (2.6%)	0.0202
Still birth	01 (1.3%)	01 (1.3%)	
Neonatal death	Nil	02 (2.6%)	
Infant death	01 (1.3%)	01 (1.3%)	
Nil	53 (70.7%)	58 (77.3%)	

Table 2. Vaginal pH in study and control group.

pH	Study group (n=75)	Control group (n=75)	P value
<3.5	09 (12.0%)	38 (50.8%)	0.0000008
4.0	20 (26.6%)	13 (17.3%)	
4.5	21 (28.0%)	13 (17.3%)	
5.0	15 (20.0%)	08 (10.6%)	
5.5	05 (6.7%)	03 (4.0%)	
>6.0	05 (6.7%)	00 (—)	
Mean	4.48±0.72	3.95±0.66	

in higher number of women in the study group (32%) as compared to that in the control group (18.7%) (Table 3), though the difference was not statistically significant. Table 3 also shows that statistically significant number of subjects in the study group tested positive for BV on gram stain (18.7%) as compared to the controls (8%) (OR =2.64, 95% CI 0.88-8.2). Sangeeta et al⁵ have also reported similar results.

Table 4 shows the analysis of the gestational age at onset of PTL in BV positive and BV negative subjects. The distribution was almost similar in both the groups as was the mean age at presentation.

Table 5 shows that the preterm contractions of significantly higher number of BV positive women in the study group could not be arrested by tocolysis

(35.7%) as compared to BV negative subjects (13.1%) (p<0.05). Even out of those who could be arrested, progressively increasing number of subjects delivered at shorter intervals from the onset of PTL as compared to BV negative subjects.

Table 6 shows that more number of BV positive subjects of the study group delivered preterm as compared to BV negative subjects. It was also found that BV positive subjects were more likely to deliver very preterm i.e. before 34 weeks (57.1%) as compared to BV negative (14.8%) (OR=5.48, 95% CI 1.29-24.41, P=0.0006). These values are highly statistically significant. Similar results have been reported by other workers²⁻⁵.

The positive cases in the control group had been given treatment for BV.

Table 3. Amine test and gram stain.

Test result	Study group (n=75)	Control group (n=75)	Statistical tests
Amine test			
Positive	24 (32%)	14 (18.7%)	
Negative	51 (68%)	61 (81.3%)	
Gram stain			
Positive	14 (18.7%)	06 (8.0%)	OR = 2.64 95% CI-0.88-8.2
Negative	61 (81.3%)	69 (92.0%)	

Table 4. Gestational age at onset of preterm labor in the study group (n=75).

Gestational age (weeks)	Bacterial vaginosis (n=14)	Bacterial vaginosis (n=61)
29-31	05 (35.7%)	20 (32.8%)
32-34	06 (42.9%)	25 (40.9%)
35-37	03 (21.4%)	16 (26.3%)
Mean±SD	32w3d±2w5d	32w5d±2w5d

Table 5. Onset of preterm labor to delivery interval in the study group (n=75).

Interval	BV positive (n=14)	BV negative (n=61)	P value
Not arrested	05 (35.7%)	08 (13.1%)	P=0.01045
<1wk	02 (14.3%)	10 (16.4%)	
2-3wk	04 (28.6%)	11 (18.03%)	
4-5 wk	02 (14.3%)	25 (40.98%)	
>5wk	01 (07.1%)	06 (9.84%)	
Lost to follow up	00 (0%)	01 (1.64%)	
Total	14	61	
Mean +/-SD	2wk1d+/-2wk2d	3wk+/-2wk5d	

Table 6. Outcome of BV positive and BV negative patients admitted with preterm labor.

GA at delivery	BV positive (n=14)	BV negative (n=61)	P value
<34 weeks	08 (57.1%)	09 (14.8%)	P=0.0006
34-37 weeks	05 (35.8%)	21 (34.5%)	
>37 weeks	01 (7.1%)	30 (49.18%)	
Lost to follow up	00 (0%)	01 (1.64%)	

Conclusions

BV is associated with both preterm labor and preterm delivery. It is even more strongly associated with very preterm delivery (<34 weeks). Therefore antenatal screening of women for BV would definitely be justified in the antenatal population at high risk for preterm labor.

References

1. Dhawane VR, Tembhare PR. Bacterial vaginosis in preterm labor. *Obstet Gynaecol Today* 2002;7:693-6.
2. 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.
3. McDonald HM, O'Loughlin JA, Jolley P et al. Prenatal microbiological risk factors associated with preterm birth. *Br J Obstet Gynaecol* 1992;99:190-6.
4. Holst E, Goffeng AR, Andersch B. Bacterial vaginosis and vaginal microorganisms in idiopathic premature labor and association with pregnancy outcome. *J Clin Microbiol* 1994;32:176-86.
5. Sangeeta, Mittal A, Chandra P et al. Incidence of gardnerella vaginalis in preterm labor. *Obstet Gynaecol Today* 1999;4:299-303.
6. McDonald HM, O'Loughlin JA Vigneswaran R et al. Bacterial vaginosis in pregnancy and efficacy of short course oral metronidazole treatment. A randomized controlled trial. *Obstet Gyecol* 1994;84:343-8.