ASSOCIATION OF BACTERIAL VAGINOSIS WITH PRETERM LABOUR
Shilpa M.N¹, A.P. Chandrashekar², G.S. Vijay Kumar³, Rashmi P. Mahale⁴

HOW TO CITE THIS ARTICLE:

ABSTRACT: OBJECTIVES: To study the prevalence of bacterial vaginosis (BV) in preterm labour and to investigate its association as one of the causative factors of preterm labour. MATERIALS AND METHODS: Fifty women who presented with preterm labour (study group) and fifty women in labour at term (control group) admitted to a teaching hospital from November 2009 to May 2011 were examined for bacterial vaginosis using Nugent score. All the statistical methods were carried out through SPSS for windows (version 16.0). STUDY DESIGN: A comparative study. RESULTS: The prevalence of bacterial vaginosis among preterm labour group was 22% and its prevalence among full term group was 4%. There was statistically significant association of BV with preterm labor when compared to term labor (p=.007). Bacterial Vaginosis was strongly associated with very preterm delivery (<34 weeks) (p=.050). Bacterial vaginosis was significantly associated with lesser gestational age at delivery and low birth weight. CONCLUSION: Bacterial vaginosis is significantly associated with preterm labour and is one of the probable causative factors of preterm labour. KEYWORDS: Bacterial vaginosis, Nugent score, Preterm labor.

INTRODUCTION: Preterm labour is defined as onset of labour prior to completion of 37 weeks gestation after period of viability.¹,² Though only 7-10% of all deliveries are preterm, prematurity alone accounts for more than 80% of perinatal morbidity and mortality in India.¹,²,³,⁴ The etiology for preterm labour is multifactorial and in many of the cases is obscure. Some of the factors associated with preterm labour are maternal age, low socioeconomic status, cervical incompetence, previous preterm deliveries, uterine abnormalities, obstetric complications like pregnancy induced hypertension, antepartum hemorrhage, antenatal urinary tract infection and multiple gestation.¹,²,⁴

Many studies have shown that bacterial vaginosis has significant association with preterm labour.¹,²,³,⁴,⁵

Bacterial vaginosis is a condition in which there is decrease in vaginal acidity and the normal lactobacillus predominant vaginal flora is replaced with anaerobic gram negative bacteria, Gardnerella vaginalis, Mycoplasma hominis and other bacteroides species.³,⁵ About 90% cases of bacterial vaginosis are caused by gram negative pleomorphic organism Gardnerella vaginalis.³

Environmental factors appear to be important in development of bacterial vaginosis. Exposure to chronic stress, ethnic differences and frequent or recent douching have been associated with increased infection rates of this condition.⁶

Hence the study was undertaken to detect the association of BV with preterm labour in a teaching hospital.
OBJECTIVES OF THE STUDY:

1. To study the prevalence of bacterial vaginosis in preterm labour in a teaching hospital
2. To study the association of bacterial vaginosis as a causative factor in preterm labour

MATERIAL AND METHODS: Source of data: The study was carried out in a teaching hospital from November 2009 to May 2011. Study included fifty pregnant women admitted for preterm labour (study group) that fulfilled the inclusion criteria and were compared with equal number of women with term pregnancy in labour (control group).

INCLUSION CRITERIA:

1. Singleton pregnancy.
2. Gestational age 28-37 weeks.
3. Intact membranes or PROM <4 hours.
4. Uterine contractions-2 contractions/45 seconds/10 minutes.
5. Cervical dilatation >1 cm.
6. Cervical effacement >80%.

EXCLUSION CRITERIA:

1. Multiple gestations.
2. Gestational age<28 weeks and >37 weeks.
3. History of leaking per vaginum >4 hours.
4. Pregnancy induced hypertension.
5. Antibiotic therapy in last one month.
6. Uterine abnormalities, cervical incompetence.
7. Infections like diarrhoea, urinary tract infections.

CLINICAL EVALUATION: A detailed history was taken regarding age, parity, period of gestation in weeks, medical history, history of vaginal symptoms like vaginal discharge, malodour, obstetric history of previous preterm deliveries and abortions, history of leak per vagina in the present pregnancy. Gestation age was calculated from the first day of the last menstrual period and was confirmed by ultra sound examination.

Baseline parameters like pulse, blood pressure, temperature were recorded. Weight and height of the patient were recorded. Presence of pallor and pedal edema was noted. Cardiovascular and respiratory systems were examined.

Abdominal examination was performed to study the height of uterus, presentation, position, lie of the fetus, liquor volume and fetal heart sounds were recorded. Speculum examination was done to note discharge and leak PV. On pervaginal examination length, dilatation of cervix and presence or absence of membranes were noted.

Cotton swabs were used to obtain the vaginal discharge from the posterior vaginal fornix and smear was prepared on a slide. Smear was Gram stained and Nugent scores for BV were assigned.
Table 1: Correlation of bacterial vaginosis with preterm labor
CC=.259; p=.007

OBSERVATIONS AND RESULTS:

<table>
<thead>
<tr>
<th>Bacterial vaginosis</th>
<th>Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study</td>
<td>Control</td>
</tr>
<tr>
<td>Absent</td>
<td>39</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>78.0%</td>
<td>96.0%</td>
</tr>
<tr>
<td>Present</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>22.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

In this study 11(22%) cases with preterm labor had bacterial vaginosis which is statistically significant compared to only 2(4%) cases in term who had bacterial vaginosis.
Figure of Gram stained vaginal smear of a patient with Bacterial vaginosis
Gram stain (1000X enlarged) showing Clue Cell, Gram variable coccobacilli (Gardnerella vaginalis), Gram negative curved bacilli (Mobiluncus sp.) and absence of thick Gram positive lactobacilli

Graph: Distribution according to Nugent score

In our study group 35 cases had normal vaginal flora, 4 had intermediate flora and 11 had flora consistent with BV and in control group 45 cases had normal vaginal flora, 3 had intermediate flora and 2 had flora consistent with BV(ICC=.266, p=.022)
Table 2: Gestational age at delivery in bacterial vaginosis

<table>
<thead>
<tr>
<th>Gestational age at Delivery (weeks)</th>
<th>Bacterial vaginosis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>29-31</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5.1%</td>
<td>0%</td>
</tr>
<tr>
<td>32-34</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>12.8%</td>
<td>45.5%</td>
</tr>
<tr>
<td>35-37</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>82.1%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

CC=.327; p=.050

In our study group 45.5% of cases with BV and 12.8% of cases without BV had gestational age of delivery at 32-34 weeks which was significant (p=.050)

Table 3: Association of LBW with bacterial vaginosis

<table>
<thead>
<tr>
<th>Birth weight (kg)</th>
<th>Bacterial vaginosis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>&lt;1.5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5.1%</td>
<td>.0%</td>
</tr>
<tr>
<td>1.51-2.5</td>
<td>27</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>69.2%</td>
<td>90.9%</td>
</tr>
<tr>
<td>2.51+</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>25.6%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

CC=.204, p=.337

In our study group 90.9% of cases with BV delivered babies with birth weight 1.5 -2.5kg and 9.1% of cases with BV had birth weight more than 2.5 kg.

DISCUSSION: Bacterial vaginosis affects about 6-32% of the pregnant women. In our study bacterial vaginosis was observed (present) in 22% of preterm labor. Study by Mittal et al shows 30% prevalence of bacterial vaginosis in preterm group. Another study by Svare et al shows a prevalence of 16%. In our study BV was found to be more common in pregnant women hospitalized for preterm labor (22%) as compared to 4% of women with labor at term, which is statistically significant(p=.007). This observation correlates with other studies that BV is a risk factor for preterm labor. Study by Hillier and coworkers showed that patients with BV were 40% more likely to have preterm delivery. The study by Subtil et al also confirmed the association of BV with increased risk of preterm delivery.

In our study 90% of patients with BV had delivered a baby of birth weight <2.5kg and BV was associated with a mean birth wt of 2.0±0.3 kg. Study done by Hillier et al also showed the
relation of BV with birth weight <2500g and a significantly reduced mean birth weight.\textsuperscript{5} Study by Svare et al also shows low birth weight and lower mean birth weight in bacterial vaginosis.\textsuperscript{9}

In our study 81.8% cases having BV diagnosed by Nugent score had clue cells. According to Easmon et al it is not always necessary to see clue cells to make a diagnosis of BV and scoring system by Nugent is more systematic and has a specificity of 95%.\textsuperscript{11}

**CONCLUSION:** Prevalence of bacterial vaginosis in preterm labour group was 22%. Significant association between bacterial vaginosis and preterm labour was observed. Hence bacterial vaginosis is one of the possible causes of preterm labour.

**REFERENCES:**

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