



A STUDY OF THE ROLE OF BACTERIAL VAGINOSIS IN PRETERM LABOUR FROM TERTIARY CARE HOSPITAL IN INDIA

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Abstract-

Introduction- Preterm labour is a challenging issue for the obstetricians even today. It is the largest contributor to the perinatal morbidity and mortality throughout the world. With the improvement of neonatal care, there has been a dramatic improvement in neonatal survival rates of preterm infants. But Neonatal Intensive Care Unit (NICU) care is expensive and a preterm baby is at an increased risk of many complications like respiratory distress syndrome (RDS), hyperbilirubinemia, etc. So preterm labour is not only a medical and social problem but also an economic burden.

Objective- Our study aims at detecting the incidence of bacterial vaginosis in preterm labour and comparing it with the control i.e. Pregnant women admitted in labour room at term.

Materials and Methods- This study was conducted at Dr. D.Y. Patil Medical College and Research Centre, Pimpri, Pune from 1st August 2006 to 31st July 2008 after taking permission from the institution's ethical board committee. The patients were divided into 2 groups: Group I- 60 pregnant patients diagnosed as preterm labour, between 24-36 weeks gestation, were screened for Bacterial Vaginosis. Group II- 60 pregnant women admitted in labour room at term were taken as control (>37 weeks gestation).

Results and Observations- 45% of the patients in Group I and 13.33% of the patients in Group II had bacterial vaginosis. 80% of the patients in group II had normal vaginal flora as compared to only 18.33% in group I. Out of 60 preterm cases 13.33% of the patients had intermediate Bacterial Vaginosis and 45% had definite Bacterial Vaginosis.

Conclusion- Significant percentage of pregnant women with preterm labour had lower genital tract infections. They can be easily screened for bacterial vaginosis using Nugent's scoring and treated with a combination of clotrimazole and clindamycin (local application). Nugent's method is considered the gold standard method for microbiological detection of bacterial vaginosis.

Keywords- Bacterial vaginosis, pre-term labour, Nugent's scoring method

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Introduction

Preterm labour is a challenging issue for the obstetricians even today. It is the largest contributor to the perinatal morbidity and mortality throughout the world. With the improvement of neonatal care, there has been a dramatic improvement in the neonatal survival rates of preterm infants. But Neonatal Intensive Care Unit (NICU) care is expensive and a preterm baby is at an increased risk of many complications like respiratory distress syndrome (RDS), hyperbilirubinemia, etc. So preterm labour is not only a medical and social problem, but also an economic burden [1-3]. Hence, all efforts should be directed towards prevention of preterm

labour and preterm birth. The etiology of preterm labour is multifactorial, but there is an overwhelming evidence to implicate infection as a major cause, accounting for about 40% of all cases of spontaneous preterm labour and preterm birth. Hoesoef M. Ridyan, et al (1993) have shown that bacterial vaginosis diagnosed in the second trimester of pregnancy plays a major role as a risk factor for preterm delivery [4-7]. Bacterial vaginosis (BV) is the most common cause of vaginal discharge in reproductive age group with the prevalence rate of 10-15%. The rate of complications resulting from bacterial vaginosis is higher in ascending infection cases such as those using intra uterine device (IUD) [7-9].

Our study aims at detecting the incidence of bacterial vaginosis in preterm labour and comparing it with the control i.e. Pregnant women admitted in labour room at term.

Material and Methods

This study was conducted at Dr. D.Y. Patil Medical College and Research Centre, Pimpri, Pune from 1st August 2006 to 31st July 2008 after taking permission from the institution's ethical board committee. The patients were divided into 2 groups:

Group I- 60 pregnant patients diagnosed as preterm labour between 24 to 36 weeks gestation, were screened for Bacterial Vaginosis.

Group II- 60 pregnant women admitted in labour room at term were taken as control (>37 weeks gestation).

Inclusion Criteria

Patients in group I were the patients in preterm labour according to ACOG (American Congress of Obstetricians and Gynecologists) criteria. ACOG defines preterm labour as onset of labour with regular, painful, frequent uterine contractions (4 in 20 minutes or 8 in 60 minutes) causing progressive effacement and dilatation of cervix (cervical dilatation >1cm & effacement ≥ 80%) occurring before 37 completed weeks of gestation.

Exclusion Criteria

Patients with cervical insufficiency, antepartum haemorrhage, eclampsia and pre-eclampsia, maternal medical complications and congenital uterine anomalies were excluded from the study.

Criteria for Diagnosis

The following diagnostic criteria were used in the study [10-15]:

Clinical Criteria:

- Foul smelling discharge,
- pH more than 4.5

Microscopic Criteria:

- Presence of clue cells,
- Absence of polymorphs,
- Absence of *Lactobacillus*,
- Presence of curved gram negative bacteria,
- Presence of polymicrobial flora (*Gardenella*, *Mobilincus*, *Prevotella*, *Peptostreptococci*)

Presence of any three of the above criteria confirms the diagnosis of Bacterial Vaginosis.

Collection of Specimen

Fluid was collected from the posterior vaginal fornix under all aseptic conditions, with a sterile swab or a Pature's pipette. The smear was prepared immediately on a clean glass slide by "roll the swab" technique, air dried and fixed immediately with heat (if Gram's staining to be done) or methanol (for Giemsa stain). In case of anticipated delay of more than two hours, the specimen was transported in Modified Stuart's Media.

Staining

The smears were stained with Gram's stain or Giemsa stain and examined under oil immersion lens of the microscope. Depending upon the microscopic picture, the smears were graded with the help of Nugent score [4].

Nugent Scoring of Vaginal Gram Stained Smear for Bacterial Vaginosis

It has a sensitivity of 93% and specificity of 97%. Determination of a normal or abnormal appearance of vaginal flora by Gram's stain is subjective. This drawback can be overcome by using Nugent scoring for Bacterial Vaginosis. The score ranges between a minimum of zero and a maximum of ten and allows for intermediates between normal and abnormal. Three morphotypes are recognized:

- Lactobacillus* morphotype-large gram positive rods,
- Gardenella vaginalis* and *Bacteroids* morphotype-small gram negative to variable rods and
- Mobilincus* morphotype-curved gram variable rods [18,19].

Table-1 Grading of Vaginal Smear According to Nugent's Score

Score	Lactobacillus	Gardenella and Bacteroides	Mobilincus
0	4+	0	0
1	3+	1+	1+ or 2+
2	2+	2+	3+ or 4+
3	1+	3+	
4	0	4+	

Vaginal smears are scored according to [Table-1] and the scores are added and graded as:

0-3: Normal; 4-6: Intermediate; 7-10: Bacterial Vaginosis

Results and Observations

Table 2- Observations on the basis of Gram or Giemsa staining of the vaginal smears

	Preterm (Group I) and (%)	Full Term (Group II) and (%)	Total and Percentage
Normal Vaginal Flora	11 (18.33)	48 (80.00)	59 (49.16)
Bacterial Vaginosis	27 (45.00)	8 (13.33)	35 (29.16)
Vaginal Candidiasis	22(36.66)	3 (5.00)	25 (20.83)
Trichomonas Vaginitis	0 (0.00)	1 (1.66)	1 (0.83)
Total	60	60	120 (100)

[Table-2] depicts the observations on the basis of Gram or Giemsa staining of the vaginal smears as- 45% of the patients in Group I and 13.33% of the patients in Group II had bacterial vaginosis. 80% of the patients in group II had normal vaginal flora as compared to only 18.33% in group I.

Table 3- Co-existence Observed between Bacterial Vaginosis and Preterm Labour

Total Cases of Preterm Labour	Intermediate Bacterial Vaginosis (%)	Definite Bacterial Vaginosis (%)	Total cases of Bacterial Vaginosis (%)
60	8 (13.33)	27 (45.00)	35 (58.33)

As shown in [Table-3], out of 60 preterm cases 13.33% of the patients had intermediate Bacterial Vaginosis and 45% had definite Bacterial Vaginosis.

Discussion

Bacterial vaginosis is often asymptomatic and is found in up to 20% women during pregnancy depending on how often the population is screened [15]. Several studies have shown that vaginal anaerobic flora and bacterial vaginosis have relation with intrauterine infection, intrauterine foetal growth restriction, premature rupture of membranes, spontaneous abortion and preterm labor [16].

The exact mechanism of bacterial vaginosis in causing preterm labour is unknown, but it seems that anaerobic vaginal flora such as *Bacteroides*, *Gardnerella Vaginalis*, *Mycoplasma hominis* and *Peptostreptococcus* replace vaginal aerobic lactobacilli and alter vaginal flora [17,18]. The products of anaerobic bacteria stimulate decidua and cause preterm labour through increase in cytokines, phospholipase A2 and prostaglandin release [19,20]. Protection by peroxides producing lactobacilli may have an important role in preventing ascending infection, prostaglandin release and membrane deficiency [21]. Inflammatory reactions following ascending infection due to bacterial vaginosis can lead to spontaneous abortion [21].

Eschenbach and co-workers were among the first researchers who studied the relationship between bacterial vaginosis and preterm labour. In their study, 49% in preterm group and 24% in full term group had bacterial vaginosis. Later they showed the correlation between bacterial vaginosis and chorioamnionitis and preterm labour [23]. Prematurity Prediction Study carried out on 3000 women in the United States has shown the relationship between bacterial vaginosis and preterm labour [24].

Vida Modares Nejad and co-workers, carried out a study to establish the association of bacterial vaginosis and preterm labour, on 160 patients in Iran in 2008, reporting 25% prevalence of BV in patients with preterm labour and 11.3% prevalence in term patients [25].

An Indian obstetrician has to face great challenge of high perinatal morbidity and mortality. The morbidity, mortality and the cost of preterm delivery is higher as compared to normal term delivery. Even if the baby survives, there is a high risk of resultant morbidity, which may be amenable to treatment such as cerebral palsy, neurodevelopmental and pulmonary disorders that can result in long term severe disabilities. Despite the advances in perinatal medicine the incidence of preterm birth continues to rise. Although tocolytics have demonstrated a prolongation of pregnancy, no tocolytic has been shown to improve neonatal outcomes till date [5]. Also their severe side effects necessitate the termination of tocolytic therapy. Therefore, our efforts should be directed towards the prevention of the preterm births as the famous dictum says, "Prevention is better than cure". In our study, there was not much difference between the 2 groups regarding age of the patients, gravida and parity. However in group I, (preterm labour patients) 25% cases had previous history of preterm labour, whereas in group II (term patients in labour), only 4% cases had previous history of preterm labour. In our study, out of 60 cases of preterm labour, 27 cases i.e. 45% had definite bacterial vaginosis, where as in group II (that is term labour patients), 8 i.e. 13.33% cases had intermediate bacterial vaginosis and none of the cases was found to have definite bacterial vaginosis. These 27 patients were treated with clotrimazole and clindamycin (dosage 100mg clotrimazole and 100mg clindamycin)

combination pessary for 6 nights, out of which 17 patients followed up. A repeat follow up smear was done for these patients. All the repeated smears were negative for bacterial vaginosis, thus proving the efficacy of these two drugs. In addition in group I out of 60 patients, 22 patients were found to have vaginal candidiasis. In a study by M.R. Joesoef, et al. clindamycin vaginal cream was proved to be an effective treatment for bacterial vaginosis [25]. Thus, out of 60 patients in group I, a total of 49 patients i.e. 81.66%, had lower genital tract infection. Various studies have proved that, lower genital tract infections are very common among apparently healthy looking pregnant women with an overall prevalence of 40-54% [28].

Bacterial vaginosis is associated with reproductive health morbidity including pelvic inflammatory disease [8,9,10] preterm birth, premature rupture of membranes [11], chorioamnionitis [12] etc. Purwar M., et al [16] found that bacterial vaginosis found in second trimester was associated with an increased risk of preterm delivery and premature rupture of membranes and accounted for 23% of the attributable risk for preterm birth [13]. A study conducted by Edward Demba, et al [7] in Gambia, West Africa using Nugent's score as the gold standard reported that the prevalence of bacterial vaginosis was 47.6%. In our study, the incidence of BV in preterm labour was 45%. Also, out of 60 cases of preterm labour, 25 patients i.e. 41.66% had preterm premature rupture of membranes (PPROM) which is significant.

Conclusion

The main objective of this study was to evaluate the role of BV as a possible etiological factor in preterm labour. It can be easily detected using Nugent's scoring method of the Gram stained vaginal smear and treated with clotrimazole and clindamycin combination in pessary or gel form in an outdoor antenatal clinic. Thus significantly reducing the burden of preterm labour. Hence it is suggested that Gram staining of the posterior vaginal swab should be used as routine screening technique for preterm labour. This technique can also be used for symptomatic patients in antenatal clinic as well as asymptomatic patients with previous history of preterm labour and/or PPRM. Whether all asymptomatic low risk patients should also be screened for BV needs further research.

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