ASSOCIATION OF BACTERIAL VAGINOSIS WITH PRETERM LABOUR

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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.⁷

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Laboratory examination of vaginal smears and the determination of the Nugent Score						
N Score = The sum of the scores for each bacterial morphotype listed below. (Note Number of Organisms seen / 100X objective)						
<i>Lactobacilli</i>	SCORE	<i>Gardnerella, Bacteroides</i>	SCORE	Curved gram-negative bacilli	SCORE	Sum=*N-SCORE
30 or >	0	0	0	0	0	0
5-30	1	<1	1	<1	1	3
1-4	2	1-4	2	1-4	1	5
<1	3	5-30	3	5-30	2	8
0	4	30 or >	4	30 or >	2	10

*Interpretation of Nugent Score		
If N Score is:	AND:	Then Report:
0-3		Smear NOT consistent with BV
4-6	Clue Cells NOT present	
4-6	Clue Cells ARE present	Smear consistent with BV
≥ 7		

OBSERVATIONS AND RESULTS:

Table 1: Correlation of bacterial vaginosis with preterm labor

Bacterial vaginosis	Group		Total
	Study	Control	
Absent	39	48	87
	78.0%	96.0%	87.0%
Present	11	2	13
	22.0%	4.0%	13.0%
Total	50	50	100
	100.0%	100.0%	100.0%

CC=.259; p=.007

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(CC=.266, p=.022)

Table 2: Gestational age at delivery in bacterial vaginosis

Gestational age at Delivery (weeks)	Bacterial vaginosis		Total
	Absent	Present	
29-31	2	0	2
	5.1%	0%	4.0%
32-34	5	5	10
	12.8%	45.5%	20.0%
35-37	32	6	38
	82.1%	54.5%	76.0%
Total	39	11	50
	100.0%	100.0%	100.0%

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

Birth weight (kg)	Bacterial vaginosis		Total
	Absent	Present	
<1.5	2	0	2
	5.1%	.0%	4.0%
1.51-2.5	27	10	37
	69.2%	90.9%	74.0%
2.51+	10	1	11
	25.6%	9.1%	22.0%
Total	39	11	50
	100.0%	100.0%	100.0%

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.⁸ 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.³ Another study by Svare et al shows a prevalence of 16%.⁹

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.⁵ The study by Subtil et al also confirmed the association of BV with increased risk of preterm delivery.¹⁰

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.⁵ Study by Svare et al also shows low birth weight and lower mean birth weight in bacterial vaginosis.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%.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:

1. Desai VA, Verma R, Mann PP. Bacterial vaginosis in patients with idiopathic preterm labor. *J Obstet Gynecol India* 2009; 59(1):53-7.
2. Dhawane VR, Tembhare PR. Bacterial Vaginosis in Preterm Labour. *Obs and Gynae Today* 2002; 7(12):693-6.
3. Sangita, Mittal A, Chandra P, Gill AK. Incidence of Gardnerella vaginalis in preterm labour. *Obs and Gynae Today* 1999; 4(5): 299-303.
4. Holst E, Rossel GA, Andersch B. Bacterial vaginosis and vaginal microorganisms in idiopathic premature labor and association with pregnancy outcome. *J Clin Microbiol* 1994; 32:176-86.
5. Hillier SL, Nugent RP, Eschenbach DA, Krohn MA, Gibbs RS, Martin DH, Cotch MF, Edelman R, Pastorek JG 2nd, Rao AV, et al. Association between bacterial vaginosis and preterm delivery of a low-birth-weight infant. The Vaginal Infections and Prematurity Study Group. *N Engl J Med*. 1995; 333(26):1737-42.
6. Culhane JF, Rauh V, McCollum KF, Elo IT, Hogan V. Exposure to chronic stress and ethnic differences in rates of bacterial vaginosis among pregnant women. *Am J Obstet Gynecol*. 2002; 187(5):1272-6.
7. Nugent RP, Krohn MA, Hiller SL. Reliability of Diagnosing Bacterial Vaginosis Is Improved by a Standardized Method of Gram Stain Interpretation. *J Clin Microbiol* 1991; 29:297-301.
8. McGregor JA, French JI. Bacterial vaginosis in pregnancy. *Obstet Gynecol Surv*. 2000; 55(5 Suppl 1):S1-19.
9. Svare JA, Schmidt H, Hansen BB, Lose G. Bacterial vaginosis in a cohort of Danish pregnant women: prevalence and relationship with preterm delivery, low birthweight and perinatal infections. *BJOG*. 2006; 113(12):1419-25.
10. Subtil D, Denoit V, Le Gouëff F, Husson MO, Trivier D, Puech F. The role of bacterial vaginosis in preterm labor and preterm birth: a case-control study. *Eur J Obstet Gynecol Reprod Biol*. 2002; 101(1):41-6.
11. Easmon CS, Hay PE, Ison CA. Bacterial vaginosis: a diagnostic approach. *Genitourin Med*. 1992; 68(2):134-8.

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