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Research Article

A Study of Bacterial Vagenosis As A Causative Factor In Preterm Labour

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ABSTRACT

Introduction: Preterm birth is the leading cause of perinatal morbidity and mortality. Bacterial vaginosis is a condition characterized by an alteration of the vaginal ecology in which the normal flora, dominated by lactobacilli, is replaced by a mixed bacterial flora which includes Gardnerella vaginalis, Mobiluncus species, Mycoplasma hominis. The prevalence of bacterial vaginosis among pregnant women varies from 6-32% in various studies. The classic symptoms of bacterial vaginosis include vaginal discharge and fishy odour. Its Complications of Bacterial vaginosis include spontaneous abortion, preterm labour and delivery, premature rupture of membranes. **Aim of study**: To assess the role of bacterial vaginosis in Preterm labour. **Materials and methods**: Prospective case control study done in all Antenatal cases with gestational age 28 weeks to 37 weeks attending the OPD or admitted in the department of OBG at Sri Siddartha Medical College, Tumakuru for duration of 24 months. **Results**: The incidence of Bacterial vaginosis in preterm labour cases was 31.2%. The mean gestational age who has gone into preterm labour was 32-36 weeks. Amsel's criteria and Nugent score on examination, was statistically significant on comparison of cases and controls (p=0.0006). **Conclusion**: Bacterial vaginosis in pregnancy is associated with adverse pregnancy outcomes including preterm labour, low birth weight and puerperal sepsis. Thus screening for bacterial vaginosis in all pregnant women complaining of vaginal discharge is essential

Key Words: *Bacterial Vaginosis, Preterm labour*

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INTRODUCTION

Preterm birth is the leading cause of perinatal morbidity and mortality. The incidence of preterm birth ranges from 5% to 8% in most developed and developing countries, but it is still increasing worldwide[1].

The world Health Organization estimates that about 15 billion babies were born preterm in 2010[2]. Preterm birth accounts for 75% neonatal deaths and 50% of long term morbidity, including respiratory disease and neuro developmental impairment[3].

Consequently preterm birth contributes to a large burden of disease, including high immediate and long term medical care costs, the need for special education services and institutional care for physically and mentally disabled infants. Bacterial infection is recognized as a major factor in the induction of preterm birth and neonatal morbidity and mortality[2].

A percentage of 40-50% is often given as the fraction of cases of premature delivery that may be due to infection. Bacterial vaginosis is a condition characterized by an alteration of the vaginal ecology in which the normal flora, dominated by lactobacilli, is replaced by a mixed bacterial flora which includes Gardnerella vaginalis, Mobiluncus species, Mycoplasma hominis, Bacteroides species and other anaerobes[4].

Bacterial vaginosis may carry a variety of symptoms or none at all. As many as 50% of women with bacterial vaginosis may be asymptomatic[5]. There is increased evidence that ascending infection from the lower genital tract is an important cause of preterm labour[6,7,8,9].

Bacterial vaginosis (BV) affects 6-32% of pregnant women[10]. BV is one of the most common gential infections in pregnancy which is associated with two to threefold increase in infection of amniotic fluid, infection of the chorion and amnion and histological chorioamnionitis[11].

AIM & OBJECTIVES

It's Objectives:

Primary objective:
To assess the frequency of occurrence of bacterial vaginosis in preterm labour.

Secondary objectives:
To assess the role of bacterial vaginosis in causation of PROM.
To determine the maternal outcome in women with bacterial vaginosis.

MATERIALS AND METHODS

All Antenatal cases with gestational age 28 weeks-37 weeks as per the inclusion and exclusion criteria are attending the OPD or admitted under OBG department, Sri Siddartha Medical College, Tumakuru

Study design: Prospective case control study.

Sampling method: Purposive sampling

Duration: 24 months
Sample size calculation:
Using the formula

$$\frac{n=Z^2(1-a)pq}{d2}$$

Z-Standard normal variate for 95% confidence interval=1.96
P=10 (Prevalence of bacterial vaginosis)[10]
q=100-p=100-10=90
d=5

On calculation n=144
Taking non-response of sample size as 10%=158
Rounding off will take 160 as sample size
Hence sample size is 160.

Inclusion criteria :
(cases)
Patients willing to participate
Age 20 – 35 Years
Gestational age between 28-37 weeks.
Regular uterine contractions of 4 in 20 minutes or 8 in 60 minutes each contraction lasting for more than 30 seconds.
Cervical effacement equal to or greater than 80%
Cervical dilatation equal to or greater than 2 cm.

Controls:
Patients not in preterm labour
Age 20-35 Years
Gestational age > 28 weeks and < 37 weeks.
Patients with associated complications were excluded.

Methodology :

A detailed clinical history was taken in a clinical proforma including age occupation, socioeconomic status, and any history of infections, obstetric history and history of previous preterm deliveries, abortions, history of diabetes mellitus, heart disease, chronic renal failure, hypertension and asthma.

The gestational age was confirmed from last menstrual period and was correlated with clinical examinations and ultrasonographic gestational age.

In the case of previous history of preterm labour the fetal and maternal prognosis was carefully analysed.
In the current pregnancy a detailed history of complication associated with pregnancy was noted.
Abdominal, vaginal and speculum examination were done.
Nature of discharge noted and vaginal swabs were taken for bacteriologic study.

The following investigations were done in pathology laboratory.
Routine investigations like Hemoglobin % total count, differential court, ESR, Urine for albumin, sugar and microscopy, Blood grouping and Rh typing.

Vaginal swabs were taken from posterior fornix by 3 sterile cotton swabs.
These collected sample was sent to microbiology lab for:

AMSEL criteria:
Gram Staining :

Large gram positive bacilli are assumed to be Lactobacillus morphotypes and smaller gram variable coccobacilli to be Gardnerella morpho types.

Presence of large number of gram positive lactobacilli morphology alone or greatly exceeding other morphological types is labelled as Netative gram stain for bacterial vaginosis.

High vaginal swab was sent for culture and sensitivity and findings were noted. Urine was sent for culture and sensitivity and findings were noted.

HIV and HBsAg-Both were done by ELISA method.
Ultrasound examination was done.

The information collected regarding all the selected cases were recorded in a Master chart. Data analysis was done with the help of computer using ssps 2.0. The Range, frequencies, Precentages, means, standard deviations, chi square and 'p' values were calucated.

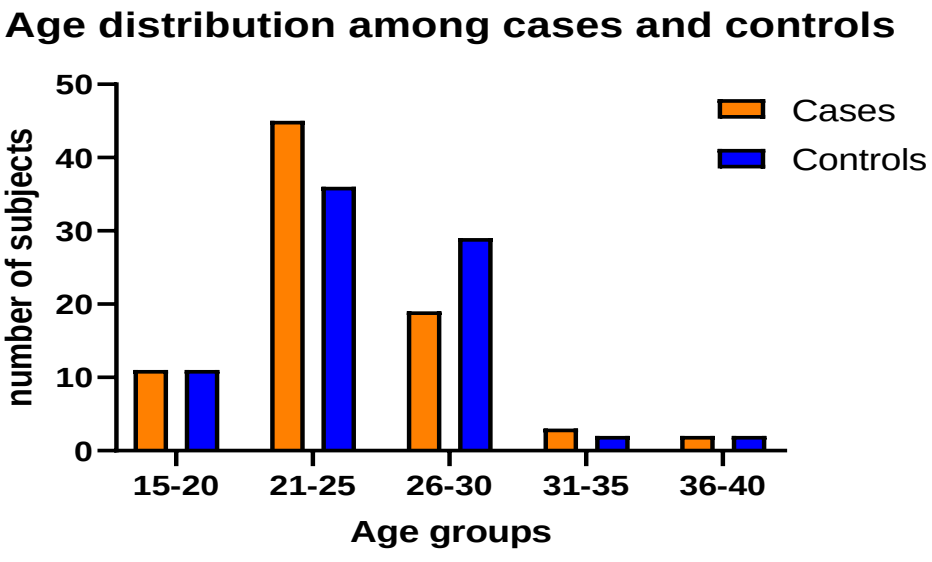
A 'p' value less than 0.05 is taken to denote significant relationship.

Sensitivity, specificity, accuracy, positive predictive value and negative predictive values were calculated using the formulae and taking 48 hours positivity results with 10 mm in duration as cut off value as the Golden standard.

RESULTS AND OBSERVATION

The incidence of Bacterial vaginosis in patients who had preterm labour in cases as 31.2% and in controls it was 0.8%. The relative risk of the presence of Bacterial vaginosis in preterm labour was found to be 3.56 (95% C.I was 1.25 – 9.18).

In the present study Age distribution varied form 15 years to 40 years in both cases and controls. Among cases majority were noted among 21-25 years constituting 55% (44/80) and among controls majority were noted among 21-25 years constituting 51.2% (41/80). Followed by 20-30 years constituting 23.7% (19/80) in cases and 36.2 %(29/80) in controls.



Graph 1 : Bar diagram showing Age distribution among cases and controls

Table 1 : Association of Age distribution and Preterm delivery with Bacterial vaginosis in cases and controls

Age distribution	case (n=80)	controls (n=80)	dF value	P value
15-20 years	11 (13.75%)	11 (7.5%)	"3.077,2"	0.2147 ns
21-25 years	45 (55%)	36 (51.2%)		

26-30 years	19 (23.7%)	29 (36.2%)		
31-35 years	03 (3.75%)	02 (2.5 %)		
36-40 years	02 (2.5%)	02 (2.5%)		
Mean age	24.5±4.95	25±1.41		
Total	80 (99.9%)	80 (99.9%)		

Chi square test- Both groups matched for age distribution. P > 0.05, not statistically significant. Age distribution was as per table.

In the present study among cases (61.2%) and controls (62.5%) majority were multifarious women when compared to primiparous women.

In our study majority were in 35-36 weeks gestation in both cases (43.7%) and controls (47.5%).

The distribution of the cases in the study group, according to the period of gestation at the time of onset of labour. There were 6 (7.5%) cases group came in preterm labour between 32-36 weeks. 19 (23.75%) of cases group and 7 (11.25%) control group subjects came between 34-36 weeks of gestational age. So mean gestational age who has gone into preterm labour was 32-36 weeks. The distribution was not statistically significant.

In the present study in 90% in case (72/80) had regular menstrual history and 91.2%(73/80) in controls also had regular menstrual history.

In our study uterine contraction were noted among cases occupying 31.2%(25/80) No contractions were noted among all the controls i.e, 100% (80/80).

In our study 31.2% (25/80) cases showed vaginal PH>4.5.
And among controls 8.7% (07/80) showed vaginal PH >4.5.

In our study positive whiff test observed in 31.2% (25/80) cases.
And among controls 8.7% (07/80) showed positive whiff test.

In our study milky discharge was noted in 31.2% (25/80) cases and 8.7% (07/80) controls.
Curd discharge was noted in 3.7%(03/80) cases and 2.5% (02/80) controls.
No discharge was noted in 65% (52/80) cases and 88.7% (71/80) controls.
In our study clue cells>20% was observed in 31.2% (25/80) cases.
And among controls 8.7% (07/80) showed clue cells>20%

Among the cases 25 subjects and 7 among the controls had>20% clue cells on examination where as 55 subjects in cases group and 73 subjects in control group had <20% clue cells, which is statistically significant on comparison of cases and controls) p-0.0006), Among the cases 25 subjects and 7 among the controls had positive Amsel's criteria on examination where as 55 subjects in cases group and 73 subjects in control group were negative for Amsel's criteria on examination, which is statistically significant on comparison of cases and controls (p=0.0006).

In our study Nugent score of 8-10 was observed in 31.2% (25/80) cases. And among controls 8.7% (07/80) showed Nugent score of 8-10).

100% cases who were positive for BV by Amsel's criteria did not have any false positive cases. But this criterion failed to diagnose bacterial vaginosis in 2 cases who were positive for bacterial vaginosis according to Nugents score. The sensitivity was 94.12% Specificity 100% positive predictive value 100%, Negative predictive 98.44%.

Nugent score was between 8 to 10 among 25 cases and 7 controls groups whereas it was between 0 to 3 among 55 cases and 73 controls subjects, which was statistically significant (P=0.0006).

In our study Preterm delivery < 37 weeks was noted in 31.2% (25/80) cases. And among controls 8.7% (07/80) showed Preterm delivery <37 weeks.

25 among cases and 7 among controls had period of gestation <37 weeks whereas 55 among cases and 73 among controls had period>37 weeks which was statistically significant)P=0.0008).

In our study 48.7% (39/80) cases delivered by Vaginal route.
In controls 57.5%(46/80) delivered by Vaginal route.

In our study in cases group 48.7% (39/80) were delivered through vaginal route and 51.2% (41/80) delivered through LSCS. Among 39 cases delivered by vaginal route, 11.2% (09/80) delivered preterm (<37 weeks) and 37.5% (30/80) were delivered Term (>38 weeks) Among 41 cases delivered by LSCS 20% (16/80) delivered preterm (<37weeks) and 31.2% (25/80) were delivered Term (>38 weeks). In our study in control group 57.5% (46/80) were delivered through vaginal route and 42.5% (41/80) delivered through LSCS. Among 46 cases delivered by vaginal route, 6.2% (05/80) delivered preterm (<37 weeks) and 51.2% (41/80) were delivered Term (>38 weeks). Among 34 cases delivered by LSCS 2.5% (02/80) delivered preterm (<37 weeks) and 40% (32/80) were delivered Term (>38 weeks).

Among 25 cases with preterm delivery 64% (16/25) were admitted in NICU and among 07 controls with preterm delivery 42.8% (03/7) were admitted in NICU.

In the present study among 23 cases (28.7%) and 07 controls (7.5%) showed Grandnerella vaginosis on swab culture and 02 (2.5%) cases and 01 control (1.25%) showed Mobilnicus.
Candidiasis was noted in 05 cases (6.25%) and 02 (2.5%) controls.

Comparative studies related to Type of discharge.

Features	Deepa masand et al study [155]		Chembati Kavitha et al Study [148]		Present study	
	Preterm	Term	Preterm	Term	Cases	Controls
No discharge	14 (28.0%)	25 (50%)	14 (28.%)	25 (50%)	52 (65%)	71 (88.7%)
White curdy Discharge	10 (20%)	4 (8%)	10 (20%)	4 (8.0%)	03 (3.7%)	02 (2.5%)
White mucoid Discharge/Milky discharge	12 (24%)	19 (8%)	12 (24%)	19 (38%)	25 (31.2%)	07 (8.7%)
Other	14 (28%)	2 (4%)	14 (28%)	2 (4%)	Nil	Nil

In the Present study 25 cases (31.2%) and 7(8.7%) controls had milky discharge where as 3 cases (3.3%) and only 2 (2.55) control subjects had curdy discharge which was not statistically significant (P=0.9090). where as in a study done by .....et al[12] the proportion of patients with discharge suggestive of bacterial vaginosis was significantly more in preterm labour group as compared to term labour group with p value of 0.0008. In Chemeabati kavitha et al[13] study out of 50 cases in group I, 36 had vaginal discharge (72%) and only 25 cases (50%) in group II. The proportion of cases with discharge were more in preterm labour group than term labour group and was found to be statistically significant (p value of 0.005).

In our study preterm delivery in 25 cases and 7 among controls had period of gestation <37 weeks whereas 55 among cases and 73 among controls had period>37 weeks with mean, 33±2 weeks; range, 33-36 weeks), which was statistically significant (P=0.0008). In Elisabet holst et al[14] preterm delivery occurred for 22 and term delivery (TD) occurred for 27 women. Of the 22 PTD women, 15 delivered at a gestational age of <34 weeks (mean, 29.9 + 2.4 weeks; range, 25 to 33 weeks) and 7 women delivered between 34 and 36 weeks of gestation (mean, 34.9 + 2.1 weeks; There was a significant difference in the presence of Bacterial vaginosis in preterm delivery women compared with that in both term delivery women and controls of the nine preterm delivery women with Bacterial vaginosis, six delivered at a gestational age of <34 weeks (mean, 29.7 + weeks; range, 26 to 33 weeks) and three delivered after 34 completed weeks (mean, 34.2 0.3 weeks). BV was significantly associated with a 2.10 – fold risk (95% CI, 1.2 to 3.7) for preterm birth prior 37 weeks of gestation but now with delivery prior to 34 weeks.

Parent study among all the 25 cases (32%) and 07 (8.7%) controls who delivered preterm, their babies were having birth weight between 2.2-2.4kg. mean weight of 2.2 the birth weight in neonates in cases and controls was statistically significantly related to the preterm gestational outcome and bacterial vaginosis (p value 0.0049**). In study done by Elisabet holst et al[15], 22 infants delivered preterm had a mean birth weight of 1,937 + 505 g. The 15 children born before 34 completed weeks of gestation had a mean weight of 1,641 + 359 g(range, 920 to 2,220g). The 7 children born between 34 and 36 weeks had a mean weight of 2,572 ± 345 g (range, 1,955 to 3,060g; P=0.0001; of the 49 women with Preterm labour, 64% (8 of 12) of women with Preterm labour, 67% (8 of 12) of women with Bacterial vaginosis were

delivered of low-birth –weight neonates (<2,500 g) compared with 22% (8 of 37) of women without the condition (P < 0.0005). Among the 22 preterm delivery women, the 9 women with Bacterial vaginosis had neonates with significantly lower mean birth weights than the 13 women without the condition (four girls and nine boys; 1,765+389g versus 2,242+587g, P<0.05).

This study proves the association of bacterial vaginosis and preterm labour, low birth weight.

We conclude that bacterial vaginosis is common among women with unsatisfactory personal hygiene, low literacy rate poor socioeconomic background and furthermore, gardnerella Vaginalis, Mobiluncus morphotypes, are the commonly found organisms in women with bacterial vaginosis.

The number of patients who fulfilled Amsel's criteria and Nugent score for diagnosis of bacterial vaginosis was significantly more in preterm labour group in both cases and controls.

It is recommended that screening and treatment of asymptomatic infections should be performed early in the pregnancy so that the complication rate can be decreased and normal pregnancy outcome achieved. Proper hygiene, early diagnosis of bacterial vaginosis and its prompt treatment may therefore reduce the risk of preterm labour.

Thus from the present study it is concluded that Bacterial vaginosis plays a significant role in causation of preterm labour.

SUMMARY

- Both groups matched for age, parity, menstrual history
- The presence of Bacterial vaginosis was significantly associated with the patients who had preterm labour and preterm birth. The presence of Bacterial vaginosis did not differ significantly with relation to age, parity and (P>0.05).
- The incidence of Bacterial vaginosis in patients who had preterm labour in cases was 31.2% and in controls it was 0.8%
- The relative risk of the presence of Bacterial vaginosis in preterm labour was found to be 3.56 (95% C.I was 1.28 -9.18). The presence of Bacterial vaginosis did not differ significantly with relation to age, parity and (P>0.005).
- 31.2% of the patients who had of Bacterial vaginosis in Cases group and 8.7% in control group gave in history of milky white discharge positive whiff test, pH more than 4.5 and clue cells. Bacterial vaginosis was significantly associated in patients who had preterm birth with history of vaginal symptoms (P<0.001).
- The sensitivity and Specificity by Amsel's criteria 94.1% and 100%. Positive predictive value 100% Negative predictive 98.44%.
- Nugent score was between 0 to 3 among 55 cases and 73 control subjects, which was statistically significant (P=0.0006).
- Among 25 cases and 7 among controls had period of gestation <37 weeks whereas 55 among cases and 73 among controls had period >37 weeks which was statically significant (P=0.0008).
- The birth weight in neonates in cases and controls was statistically significantly related to the preterm gestational outcome and bacterial vaginosis (p value 0.0079**)

REFERENCES

1. Bhide A, Arulkumaran S, Damania KR, Daftary SN(2015). Arias' Practical guide to high risk pregnancy and delivery. 4th edition. New Delhi : Elseiver; 135p.
2. Witkin SS(2015). The vaginal microbiome, vaginal antimicrobial defence mechanisms and the clinical challenge of reducing infection related preterm birth. BJOG; 122(2) : 213-218.
3. Goldenberg RL, Culhane JF, JD, Romero R(2008). Epidemiology and causes of preterm birth. Lancet; 371(9606); 75-84.
4. Speigel CA, Amsel R, Holmes KK(1983). Didgnosis of bacterial vaginosis by durect Gram Stain of vaginal fluid. J clin Microbiol; 18:170-7
5. Hay PE, Taylor RD, Lamont RF(1992). Diagnosis of bacterial vaginosis in a Gynecology Clinic. Br J Obstet Gynecol. 1992; 99: 63-6.
6. Blackwell AL, Phillips I, Fox AR, Barlow D(1983). Anaerobic vaginosis (nonspecific vaginitis): Clinical, microbiological and therapeutic findings. Lancet; ii: 1379-82.
7. Spiegel CA, Davick; P, Totten PA(1983). Gardnerella vaginalis and anaerobic bacteria in the etiology of bacterial (nonspecific) vaginosis. Scand J Infect Dis Suppl 1983; 40 : 41-6.
8. Masfari AN, Duerden BI, Kinghorn GR(1986). Quantitative studies of vaginal bacteria. Genitourin Med; 63: 256-63.
9. Hoist E(1990). Reservoir of four organisms associated with bacterial vaginosis suggests lack of sexual transmission. J Clin Microbiol; 28:2035-9.

10. Chawanpaiboon S, Pimol BNK (2010) Bacterial vaginosis in threatended preterm, preterm and term labour. J Med Assoc Thai 93(12): 1351-1355.
11. Gregor JA, French JI (2000) Bacterial vaginosis in pregnancy. Obstet Gynecol Surv 55(5): S1-19.
12. Spiegel, C. A., Amsel, R., & Holmes, K. K. (1983). Diagnosis of bacterial vaginosis by direct gram stain of vaginal fluid. Journal of clinical microbiology, 18(1), 170-177.
13. Kiran, C. K., Kandati, J., & Ponugoti, M. (2017). Prevalence of bacterial vaginosis in preterm and termlabour: a one year study. Int J Reprod Contracept Obstet Gynecol, 6(6), 2292-2296.
14. Vásquez, A., Jakobsson, T., Ahrné, S., Forsum, U., & Molin, G. (2002). Vaginal Lactobacillus flora of healthy Swedish women. Journal of clinical microbiology, 40(8), 2746-2749.
15. Holst, E., Goffeng, A. R., & Andersch, B. (1994). Bacterial vaginosis and vaginal microorganisms in idiopathic premature labor and association with pregnancy outcome. Journal of clinical microbiology, 32(1), 176-186.