

Original Research Article

Bacterial Vaginosis in Patients of Preterm Labor

Shikha Jain, Neha Jain, Veena Agarwal

Gajraraja Medical College, Gwalior, MP.

Corresponding Author: Shikha Jain

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ABSTRACT

Background: Bacterial vaginosis is the most common vaginal infection in women of reproductive age. It is opined that bacterial vaginosis before or during pregnancy may affect the decidual inflammatory response that leads to preterm birth. Premature infant is the most common cause of death among infants world-wide and those, who survive are at greater risk for cerebral palsy, delays in development, hearing problems. This study was done to find bacterial vaginosis as a risk factor of preterm labor.

Study Design: Case-control study.

Materials and methods: Pregnant women of gestational age between 28-37 weeks with preterm labor were taken as study group and pregnant women of same gestational age without any signs and symptoms of preterm labor were taken as control group to compare the incidence of bacterial vaginosis. Data obtained were statistically analysed by chi-square test and student t-test, significance was expressed in terms of "p" value. Amsel's criterion was taken for interpretation of results.

Result: In our study group 33% women were having bacterial vaginosis compared to 17% in control group. This result was statistically significant to prove bacterial vaginosis as a significant cause of preterm labor ($p=0.0143$ and $RR=1.48$)

Conclusion: In our study bacterial vaginosis was found to be an important risk factor for preterm delivery. Early diagnosis of bacterial vaginosis in patients of preterm labor pains and treatment in time can prevent preterm birth.

Keywords: Bacterial vaginosis, Preterm labor, Amsel's criteria.

INTRODUCTION

Preterm labor is defined as the presence of uterine contractions of sufficient frequency and intensity to effect progressive effacement and dilation of the cervix prior to term gestation. The rate of preterm birth ranges from 5% to 10%.^[1] It is estimated that 25-40 % of preterm birth result from intrauterine infections.^[2] Among all of intrauterine infections, bacterial vaginosis has a major role in preterm labor.

Bacterial vaginosis is characterised by a change from the normal lactobacillus

dominated flora with a pH below 4.5 to a mixed anaerobic flora with a pH above 4.5. Symptoms include malodorous (fishy) increased vaginal discharge. Complications of bacterial vaginosis in pregnancy include preterm labor, PROM (premature rupture of membrane), amniotic fluid infection, chorio-amniotic infection and histologic chorio-amnionitis. Bacterial vaginosis can be diagnosed by clinical criteria or by lab testing. The Gram stain method (Nugent scoring) is considered to be gold standard, but in urgent situations where an immediate

result is needed, clinical methodology is useful. The most widely accepted clinical criteria is Amsel's criteria as it is simple, less time consuming and results are comparable to gram stain technique. [2] Shahzadi N. in 2002 found Amsel's criteria are a sensitive method for diagnosis of bacterial vaginosis when compared with gram staining. [4]

MATERIALS AND METHODS

Material: This study was conducted in department of obstetrics & gynaecology, Kamla Raja Hospital, Gwalior (M.P.) during year 2010-11 after obtaining approval from Hospital Ethics committee.

Written informed consent was taken by the patients after explaining the procedure which were included in the study.

The pregnant women of gestational age between 28 and 37 weeks with preterm labor (painful uterine contractions >2 in 10 minutes, each lasting >45 seconds) were taken as study group (n=100) and pregnant women of same gestational age without any signs and symptoms of preterm labour were taken as control group (n=100), to detect and compare the incidence of bacterial vaginosis in both groups.

Inclusion criteria:

1. Singleton pregnancy
2. Gestational age between 28-37 weeks
3. Intact membranes

Exclusion criteria:

1. Gestational age <28 weeks and >37 weeks
2. History of antepartum haemorrhage
3. Urinary tract infection, respiratory tract infection, diarrhoea or any other obvious cause for preterm labor.
4. Medical complication of pregnancy such as moderate to severe anaemia, pregnancy induced hypertension and diabetes mellitus.
5. History of leaking per vaginum or absent membranes.
6. Intrauterine growth restriction.
7. Intrauterine fetal death

8. Antibiotic therapy in the last 30 days
9. Coitus during last 24 hr.

Method: Per speculum examination of the study and control group was done at their outpatient department visit. A non-lubricated speculum was passed into the vagina and the condition of the vaginal wall, nature of the discharge (amount, colour, consistency) and the condition of the cervix was noted. First sample was taken with the help of sterile cotton tipped swab, from the posterior vaginal fornix. This was first tested for pH with the help of pH indicator strip (3.5 to 6) and the vaginal discharge collected on the speculum was tested for 'Fishy odour' on addition of two drops of 10% potassium hydroxide solution. Then sample rolled onto a glass slide and wet mount with normal saline, covered with cover slip and examined under microscope. A patient of study group was admitted for further management and patient of control group was advised for follow up after 1 week. Patients of study and control group were grouped as positive and negative for bacterial vaginosis as per Amsel's clinical criteria.

At least three of the following clinical criteria must be fulfilled to establish the diagnosis of bacterial vaginosis (Amsel et al.1983). [5]

The criteria's are:

1. Thin homogenous vaginal discharge
2. Vaginal pH >4.5
3. Release of a fishy odor from the vaginal discharge on alkalisation with 10% potassium hydroxide solution (Amine Odor test).
4. Vaginal epithelial cells heavily coated with bacilli (>20% Clue cells).

Patients who fulfilled three of the four clinical criteria were labelled as bacterial vaginosis positive and those who not fulfilled at least three clinical criteria were labelled as bacterial vaginosis negative. Sensitivity, specificity, positive and negative predictive value of all

individual criteria were calculated. Data obtained at the end of the study was noted and statistically analyzed by chi-square test and student t-test, significance was expressed in terms of "p" value.

RESULTS

A total of 200 preterm patients were examined. Mean age of women in case group was 25.45±3.14 years and in control was 23.35±2.39 years. Mean gestational age of women in cases was 31.73 wk and in controls was 30.52±2.5 wk.

Incidence of bacterial vaginosis in preterm patients with labor was 33% by Amsel's criteria and the same in preterm patients without labor was 17%.

The result was statistically significant (p=0.0143), R.R=1.48 (C.I=1.43-1.93). The sensitivity of pH, homogenous discharge, Whiff test was 100% but the specificity was 47.7%, 51.4%, 86% respectively. The clue cells had lowest sensitivity (80%) but highest specificity (92%).

Table-1: Results of various tests of Amsel's criteria

Clinical Criteria	Total no of patients with bacterial vaginosis positive by Amsel's criteria (n=50)	Total no of preterm patients(n = 200)
pH test positive	50	126
Whiff test positive	50	123
Homogenous milky discharge positive	50	71
Clue cells positive	40	52

Table-2: Final results

GESTATIONAL AGE			29-31 wks	32-34 wks	35-37 wks	Total
CASES	100	BV (+) cases	25	6	2	33
		BV (-) cases	42	15	10	67
CONTROL	100	BV (+) cases	11	5	1	17
		BV (-) cases	61	14	8	83
P VALUE			0.00	0.02	0.007	0.0143

Table-3: Value of various tests

Individual criteria	Sensitivity	Specificity	Positive predictive value	Negative predictive value
pH Test	100	47.7	39.4	100
Homogenous milky discharge	100	51.4	40.6	100
Whiff test	100	86	70.4	100
Clue cells	80	92	100	93.3

DISCUSSION

The preterm labor and its associated complications to the mother are a challenge to the obstetrics. The accurate identification of a patient at risk of preterm labour and its prevention is of immense importance.

In our study group 33% women were having bacterial vaginosis compared to 17% controls. The result was highly significant statistically to prove bacterial vaginosis as a cause of preterm labour (p value 0.0143 and RR 1.48).

Our study also corresponds to the study by Laurie Barclay who found a

prevalence of bacterial vaginosis as 38.7% in the study population. [6]

Desai VA et al conducted a prospective cohort study on 150 patients; concluded presence of bacterial vaginosis in women admitted with idiopathic preterm labor is associated with preterm delivery. [7] Hoyme UB et al found, abnormal vaginal floras as well as bacterial vaginosis have a significant relative risk for miscarriage or preterm birth (1.4-6.9). [8]

In our study clue cells criteria was most specific (92%) followed by whiff test (86%) among other criteria. Sensitivity of pH test, homogenous white discharge, and

whiff test was equal i.e. (100%) while that of clue cells was less i.e. (80%).

Thulkar et al also reported that vaginal pH is the most sensitive criteria in diagnosis of bacterial vaginosis. [9] Shahzadi N et al conducted a study and conclude whiff test had the highest sensitivity (87%) and specificity (96%) among all other criteria, this result also correlates with our study result. [5]

CONCLUSION

The incidence of bacterial vaginosis in patients with preterm labor was more as compared to patients without preterm labor (33 % vs 17 %). There was no statistically significant difference found as far as the mean maternal age is considered but was more common in gestational age between 29-31 wks. Whiff test was the most sensitive and highly specific criterion among all other clinical criteria and clue cells was most specific individual criteria.

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