

Study Of Association Between Vaginal Infection And Preterm Labour

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Abstract: Background: Preterm birth is the most common of neonatal morbidity and mortality. 85% of neonatal morbidity and mortality is due to premature birth. A large number of studies demonstrate an association between specific organisms and preterm delivery. Material And Methods: A retrospective cohort study of pregnant women who received antenatal care between august 2017 and November 2018 at our tertiary care hospital. 70 Cases with high risk for preterm labor were included in the study and 70 cases with term labor in the control group. High vaginal swabs were collected from the posterior fornix of the vagina. Result: This study shows that there is no association of preterm labor with age, parity and numbers of previous abortions. There are high chances of preterm birth in patients with history of previous preterm birth. 48(68%) patients with preterm labor had vaginal infection in which bacterial vaginosis is more common. Other contributing factors for preterm delivery: Anaemia and lower socio-economic status. Conclusion: In this study, a significant difference in the presence of vaginal infection in patients of preterm labor and term labor was found ($P < 0.05$). Women at risk for preterm birth or preterm premature rupture of membranes because of vaginal infections should be screened, diagnosed, treated, re evaluated, and re-treated if necessary. [Vaghela R Natl J Integr Res Med, 2022; 13(3): 06-09, Published on Dated:10/05/2022] **Key Words:** Bacterial Vaginosis, Anemia, Preterm Labor, Premature Birth

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Introduction: Preterm birth is the most common of neonatal morbidity and mortality. 85% of neonatal morbidity and mortality is due to premature birth. Preterm birth may either be a physiological process that has occurred too soon or a pathological process following an abnormal stimulus. Bacteria like Lactobacillus lactis have a vaginal cleansing effect, minimizing the presence of common bacterial species¹. Recent high-throughput sequencing of 16S rRNA gene of the vaginal bacterial communities of pregnant women showed that the vaginal microbiome becomes more stable and less diverse as pregnancy progresses, which confers a protective role against ascending infection of the genital tract².

A large number of studies demonstrate an association between specific organisms and preterm delivery. Organisms as Chlamydia trachomatis, Mycoplasma hominis, Neisseria gonorrhoeae, T.vaginalis, G.vaginalis, Peptostreptococcus, group B streptococci and Ureaplasma urealyticum have all been correlated with one or more of such abnormal outcomes of pregnancy. Bacterial vaginosis is

characterized by high concentration (10⁸ to 10¹¹ CFU/gm of fluid or greater) of G. vaginalis and potentially pathogenic bacterial vaginosis-associated microorganisms, most notably Bacteroides spp., peptostreptococcus spp., Mobiluncus spp., along with M. hominis³.

Aims And Objectives: To study the association between vaginal infection and preterm labor and fatal outcome.

Material & Methods: We conducted a retrospective cohort study of pregnant women who received antenatal care between august 2017 and November 2018 at our tertiary care hospital. 70 Cases with high risk for preterm labor were included in the study and 70 cases with term labor in the control group with their informed consent. We recorded basic demographic data, the obstetrics history, comorbidities, gestational age at first diagnosis, termination of pregnancy, Neonatal outcome and its' complications. High vaginal swabs were collected from the posterior fornix of the vagina of each patient and placed in sterile normal saline for culture for Gram staining, potassium

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hydroxide test, and saline wet mount preparation. Study group consisted of patients with spontaneous onset of Preterm Labor between 28 weeks and 36 weeks of gestation age.

Painful uterine contractions (frequency of at least one contraction lasting for a minimum of 10-15 seconds during the interval of 10 minutes).At least minimal cervical changes (i.e. Bishop score three and Cervical dilatation one cm).

Control group consisted of patients with greater than 36 weeks of gestation age. Patients with Chorioamnionitis, Antepartum hemorrhage, Antenatal patients with diagnosed congenital anomaly in foetus are not included.

Results: The study consisted of 140 cases, divided into two groups of 70 each. Group I consisted of 70 women in spontaneous preterm labor (study group) and Group II consisted of 70 women in spontaneous labor at term (control group).To find the association of variables, and statistical tests were carried out appropriately.

Continuous and categorical data were analyzed using descriptive statistics. Association with p value <0.05 was considered statistically significant.

Table 1: Age Distribution

Age Intervals (Years)	Study Group	Control Group
20-24	27	28
25-29	29	20
30-35	14	22

Table 1 is showing age distribution. Both study group and control group matched for age distribution. P>0.05 value is statistically not significant. Hence there is no association between age and preterm labor.

Table 2: Parity Distribution

No. Of Previous Pregnancies	Study Group	Control Group
0	18	12
1	22	18
2	11	19
>3	19	21

As table 2 both groups matched for parity distribution, P>0.05, not significant.

Table 3: Distribution According To Number Of Previous Abortions

No. Of Previous Abortions	Study Group	Control Group
0	36	28
1	09	18
2	12	19
3	13	05

There are more chances of preterm labor in patients with history of 3 previous abortions.

Table 4: Distribution According To Number Of Previous Preterm Deliveries

No. Of Previous Preterm Deliveries	Study Group	Control Group
0	36	56
1	13	12
2	12	02
3	09	00

With increased number of previous preterm deliveries, higher chances of preterm labor.

Table 5: Incidence Of Vaginal Infection

	Study Group	Control Group
Patient Without Vaginal Infection	22	52
Patients With Vaginal Infection	48	18
Type Of Vaginal Infections	Study Group	Control Group
Bacterial Vaginosis	21	08
GBS	13	06
Candidiasis	09	03
Trichomoniasis	05	01

Table 5 shows incidence of vaginal infection.

In study group 48(68%) patients and in control group 18(25.7%) patients had vaginal infection, which is significant (<0.05).

Suggestive of strong association between vaginal infection and preterm labor.

Among the patients with vaginal infection, the majority of the patients (43.8 %), had bacterial vaginosis.

Preterm labor is more common in patients with anaemia with infection(Table 6).

Table 6: Associated Factors

		Study Group	Control Group
Anaemia	With Infection	17	02
	Without Infection	09	05
Lower Socioeconomic Class	With Infection	30	18
	Without Infection	18	22

Table 7: Neonatal Complications

Neonatal Complications	Study Group	Control Group
Septicemia	11	05
Respiratory Distress Syndrome	05	01
Intraventricular Hemorrhage	03	01
Neonatal Jaundice	24	15

Discussion: This study shows that there is no association of preterm labor with age, parity and numbers of previous abortions. There is high chances of preterm birth in patients with history of previous preterm birth .48 (68%) patients with preterm labour had vaginal infection, in which bacterial vaginosis is more common. Results of multiple studies have shown that women with asymptomatic bacteriuria have a higher preterm delivery rate than women without bacteriuria⁴.

One hypothesis is that the pathologic effect of bacterial vaginosis could operate through changes in the cervical matrix and result in shortened mid-trimester cervical length, a well-recognized risk factor for spontaneous preterm labor⁵.

Results of a large study by National Institute of Child Health Development (NICHD) sponsored vaginal infections and precautionary study group demonstrated 10% increased risk for preterm premature rupture of membrane.

The high concentration of potentially pathogenic microorganisms in the genital tract of pregnant women may increase the possibility of an ascending infection via the cervix, decidua, fetal membranes, maternal placenta, and amniotic fluid. Some of the bacteria associated with bacterial vaginosis such as *Bacteroides* sp. are particularly virulent.

Significant work over the past decade has focused national and international attention on this common condition and bacterial vaginosis is increasingly recognized as directly related to a number of serious obstetrical and gynaecological complications. A possible mechanism for the link between asymptomatic genital infection and PTB

is the bacterial stimulation of prostaglandin release or bacterial endotoxin introduced into the amniotic fluid leading to cytokine release and spontaneous labor^{6,7}. Higher levels of *Megasphaera*-like species were also found among the group of women experiencing a SPTB during the follow-up period⁸.

Other contributing factors for preterm delivery: Anaemia and lower socio-economic status. In study group 17(65%) patients with anaemia had vaginal infection. Anaemia is significantly associated with vaginal infection during pregnancy.

Half of the women who had anaemia reported pathological vaginal discharge. During pregnancy patients with low socioeconomic conditions are more likely to have vaginal discharge. A need for proper treatment of vaginal discharge, pregnant women should be educated on good hygiene habits and prevention.

Univariate and multivariate analyses found that infections were strongly associated with and predictive of anemia⁹. After preterm delivery, neonatal complications like neonatal jaundice, respiratory distress syndrome, septicemia and intraventricular hemorrhage are observed, in which neonatal jaundice is more common.

Conclusion: In this study, a significant difference in the presence of vaginal infection in patients of preterm labor and term labor was found ($P < 0.05$). Women at risk for preterm birth or preterm premature rupture of membranes because of vaginal infections should be screened, diagnosed, treated, re-evaluated, and re-treated if necessary. Bacterial vaginosis (BV) is a common abnormal vaginal condition which is the leading

cause of abnormal vaginal discharge and other symptoms worldwide.

Limitations: Small sample size. This study can be carried out at larger scale with consideration of different classes of patients.

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