ASSOCIATION OF UROGENITAL INFECTIONS WITH PRETERM DELIVERIES

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Abstract

Introduction: Urogenital infections are usually seen during pregnancy and considered as an important cause of preterm labour. Preterm labour is the one of the foremost reason of neonatal morbidity and mortality. Bacterial vaginosis (BV), vulvovaginal candidiasis (VC), and trichomoniasis are responsible for near about 90% of cases of infectious conditions which can lead to eventually gynecological and obstetrical complications such as preterm labour, pelvic inflammatory disease, post-abortion endometritis and chorioamnionitis. Most common infection among women in preterm labour is BV. This study was conducted to find the association between urogenital infections and preterm labour and also to find out prevalence of urogenital infections in preterm and full term labour.

Method: It was an observational study done in the Department of obstetrics and gynecology IGMCM Shimla H.P. from 1st August 2017 to 31st July 2018. A total of 200 women were observed for urogenital infections and their association with preterm labour. Case Group I included 100 women with preterm labour after 24 weeks and before 37 completed weeks of gestation with or without rupture of membranes. Control Group II included 100 women at completed or more than 37 weeks of gestation with no history of preterm labour, matched to the case group with respect to age and parity. Midstream urine was sent for microscopic examination and culture sensitivity. Samples were taken for microbiological study from posterior fornix of vagina. These were studied for microscopic examinations along with Culture sensitivity by standard methods and saline wet mount for BV, VC, Trichomoniasis.

Results: In present study, overall 18% urogenital infection was observed. Statistical analysis reveals that there was association in high vaginal swab, urine culture and both culture positivities.

Conclusion: We concluded that in our study, urogenital infection was more common in women with preterm labour compared to those in full term labour patients group which indicates a significant association of urogenital infections in preterm labour.

Keywords: Urogenital Infections, Bacterial Vaginosis, Vulvovaginal Candidiasis, Premature Labour

Introduction

Preterm labour is a multifactorial condition associated with a high risk of neonatal morbidity and mortality, especially at lower gestational ages and it is a heterogeneous condition with numerous associated social and medical risk factors.¹ In the developed countries, the incidence of preterm birth is 5-10%, whereas it is around 25% in developing countries. Worldwide incidence of premature birth ranges between 6-11%.² The causes of most preterm labour, PPRM, PROM is not known, but a variety of conditions have been shown to be associated with an increased risk of preterm delivery. One of the causes is infection and vaginal infection, a common vaginal syndrome in women of reproductive age, has been associated with increased risks for prematurity and premature rupture of membranes³.

Urogenital infections (UGIs) are mostly widespread and considered as an important cause of premature labour.⁴ The urinary tract of pregnant women undergoes considerable physiologic alteration from around seven weeks until term. The ureters and renal pelvis dilate, ureteric peristalsis is reduced and bladder tone reduces. These changes predispose women to UTI.^{5,6} Most common uropathogen in pregnant women is E.coli, klebsiella pneumonia, proteus mirabilis, enterobacter species, staphylococcus saprophyticus, and group B streptococcus. Asymptomatic bacteriuria suggests presence of $\geq 10^5$ organisms per ml of urine of a single uropathogen cultured from a clean voided specimen without symptoms. These complications emphasize on regular screening and treatment of asymptomatic bacteriuria in pregnant women. The presence of pathogenic bacteria in the bladder of pregnant women is associated with the mass

colonization of the inferior genital tract and the presence of chorioamnionitis, even when the infection is subclinical.⁷

Bacterial vaginosis (BV), vulvovaginal candidiasis (VC), and trichomoniasis are accountable for near about 90% of cases of infectious conditions like vulvovaginitis, which can lead to gynecological and obstetrical complications such as pelvic inflammatory disease, chorioamnionitis, premature labour^{8,9}. Many Studies have shown that trichomoniasis is associated with the untimely rupture of membranes, low birth weight, postpartum endometritis, premature delivery along with stillbirth and sometimes neonatal death.¹⁰

The present study is a baseline urogenital infection prevalence study and it will be useful in monitoring of intervention programmes like MCH, STI control and prevention of preterm term labour and ultimately to reduce maternal and perinatal mortality.

Materials and Methods

This was a hospital based prospective observational study conducted to investigate urogenital infection from 01 August 2017 to 31 July 2018 at IPD Department of Obstetrics and Gynaecology IGMCH Shimla HP. In this study, total 200 subjects were selected randomly as per inclusion and exclusion criteria. Group A comprised of 100 cases of preterm labour between 24 weeks to less than 37 weeks of gestation while Group B comprised of 100 full term patients. The institutional ethical clearances were obtained before initiating this study and well informed consent was obtained.

Inclusion criteria:

- Gestation age >24 weeks to <37 weeks. Patients not sure of LMP, 1st trimester USG was considered for calculation of gestation age.
- Spontaneous onset preterm labour.
- Preterm premature rupture of membranes.

Exclusion criteria

- Any congenital malformations such as anencephaly, hydrocephalus or multiple congenital anomalies.
- Multiple pregnancies.
- Patients with genital tract malignancy

Study Procedure:

All women were evaluated by detailed history and examination. Each patient underwent a general physical, systemic, per speculum and per vaginam examination along with urine culture, high vaginal swab culture. Mid stream urine was taken. Vaginal samples were taken for microbiological study from posterior fornix of vagina. These were taken with two sterilized swabs under direct vision using Cusco/Sims speculum. These were studied for microscopic examinations along with Culture sensitivity by

standard methods and saline wet mount for BV, VC, Trichomoniasis.

Statistical analysis:

The data was analysed with the help of SPSS software, the statistical analysis is achieved with chi square test.

Results

In this study, it was observed that Bacterial Vaginosis was present in 28 patients in preterm labour patients and 5 patients in full terms. Candidiasis was seen in 15 in pre term patients and in 2 in full term, while Trichomoniasis was in 10 pre term patients and 4 patients in full term. Statistically it was revealed that there was association in variables as p value is <0.001 in bacterial vaginosis and Candidiasis but association with trichomoniasis in preterm labour was not significant (Table 1)

Table 1: Result of Saline Wet Mount of preterm and full term patients.

Saline Wet Mount	Preterm labour patients Group (n=100)	Full term labour patients Group (n=100)	P value
Bacterial Vaginosis	28	5	<0.001
Candidiasis	15	2	<0.001
Trichomoniasis	10	4	>0.001

In urine culture test for micro-organism, infection was present in 30 preterm labour patients while 70 patients were negative in pre term labour for urine culture. 8 patients in full term labour had positive urine culture while 92 had sterile urine culture. It was statistically considerably significant as p value < 0.001 (Table 2). In urine culture E coli was the commonest organism found in preterm labour patients, found in 22 patients. Other were Staphylococcus Aureus in 4, Proteus Vulgaris in 2, Candida albicans in 1 and Pseudomonas Aeruginosa in 1.

Table 2: Distribution of the urine sample of preterm labour and full term labour patients

Urine culture	Preterm labour Group (n=100)	Full term labour Group (n=100)	P value
Positive	30	8	<0.001
Negative	70	92	

In high vaginal swab test, culture was observed positive in 27 preterm labour patients while 12 in full term labour patients. It was negative in 73 patients of preterm labour and 88 patients of full term labour. It is statistically significant as p value < 0.05 (Table 3)

Table 3: Distribution of result of high vaginal swab (HVS) culture in preterm labour patients and full term labour patients.

High vaginal swab	Preterm labour Group (n=100)	Full term labour Group (n=100)	P value
Positive	27	12	<0.05
Negative	73	88	

In this study urinary tract infection was present in 30 women, genital tract infection was seen in 27 women and 18 women had combined urogenital infection (Table 4).

Table 4: Comparison of Urogenital infection in preterm labour patients and full term labour patients according to the type of infection.

Type of Infection	Preterm labour patients	Full term labour patients	P value
Urinary tract infection positive	30	8	<0.001
Genital tract infection positive	27	12	<0.05
Urogenital (Both)	18	4	<0.05

Discussion

Preterm labour is an obstetrics emergency and a threat to population health. 75% of the infant mortality is related to preterm birth. The vast majority (85%) of global preterm births occur in Asian and African continents, where health systems are weak and inadequate as per the standards of developed nations.¹¹ The pathogenesis of preterm labour is not properly understood but multi-factorial etiology has been postulated. A significant amount of evidence suggests that preterm labour is mediated via infection and inflammation. Urogenital infections contribute significantly to the preventable causes of preterm labour.¹ UTI was seen in 30% of preterm labour patients in our study. Samim A et al¹² reported 40% incidence of UTI in their study and Pandey Kiran et al¹³ reported 20.34% incidence of UTI in their study. Fernandes F et al¹⁴ reported 13.65% incidence of UTI.

Vaginal infections were noted in 27% women in the present study. In the study done by Pradeep Raju S et al¹⁵ the incidence of vaginal infections was 58.06% in women with preterm labour. Incidence of vaginal infections was high when compared to the study conducted by Fernandes F et al¹⁴ who reported an incidence of 8.29%.

Indu verma et al¹⁶ showed the prevalence of infection as 17.3%. In the case group (Group A) of 50 preterm labour patients of preterm labour the frequency of genital tract infection, urinary tract infection (UTI) and collective genitourinary infection (GUI) was 44%, 30% and 16% respectively as measure up to 10%, 6% and 0% in the Group B, suggesting a statistically significant relationship of prevalence of genital as well as urinary tract infection in patients with preterm labour. In present study, 30% preterm labour patients were positive for urine culture, 27% preterm labour patients were found positive in high

vaginal swab culture and 18% having both type of infection.

Conclusion

Prematurity is a most important cause of neonatal and infant morbidity as well as mortality. Several times it happens unexpectedly in low risk women. Many biochemical and imaging predictors have been evaluated as screening test of preterm labour. Due to the fact that urogenital infections cause preterm labour, early screening and treatment are necessary to reduce mortality and morbidity resulting from premature labour and birth.

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