

# Urogenital Infections – A Cause of Pre Term Labor

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## ABSTRACT

**Introduction:** Urogenital infections (UGIs) are mostly widespread when unhygienic condition and during pregnancy and considered as an important cause of premature labor. Preterm labour is the one of the foremost reason of neonatal morbidity and mortality. Bacterial vaginosis (BV), vulvovaginal candidiasis (VC), and trichomoniasis are accountable near about 90% of cases of infectious conditions like vulvovaginitis, which can lead to eventually gynecological and obstetrical complications such as pelvic inflammatory disease, post-abortion endometritis, chorioamnionitis, and premature labour and most common infection among women in preterm labor is BV. Study aimed to find and correlate the association between urogenital infections and preterm labour. Also to find out prevalence of urogenital infections in preterm and full term labour.

**Material and methods:** Total 50 women participants were recruited in this study who reported to Obstetrics and Gynaecology Department of Krishna Institute of Medical Sciences, Karad after satisfying the inclusion/exclusion criteria.

**Results:** In present study, overall 34% urogenital infection was observed. Statistical analysis reveals that there was association in high vaginal swab, urine culture and both culture positivity.

**Conclusion:** We conclude that in our study, urogenital infection was 3.77 times (34%) more in women with preterm labor compared to those in full term labour patients group (9%), which indicates a significant association of urogenital infections in preterm labor. Urogenital infection contributes significantly to preventable cause of labour.

**Keywords:** Urogenital Infections, Bacterial Vaginosis, Vulvovaginal Candidiasis, Premature Labor

## 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. Evaluation of the extent in such conditions is very essential to engage in the problem regarding the morbidity and mortality due to urogenital infections. There is overwhelming verification that infectivity is a most important cause of impulsive preterm labour.<sup>1</sup> Urogenital infections (UGIs) are mostly widespread when unhygienic condition and during pregnancy and considered as an important cause of premature labor. Preterm labour is the one of the foremost reason of neonatal morbidity and mortality. The rate of preterm labour in India at present is around 21%. India contributes 23.6% of preterm births of total global incidence.<sup>2</sup>

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 both upper and lower UTI.<sup>3-5</sup> Most common uropathogen in pregnant women is *E.coli*, *klebsiella pneumonia*, *proteus*

*mirabilis*, *enterobacter* species, *staphylococcus saprophyticus*, and group B streptococcus. Asymptomatic bacteriuria suggests significant bacteriuria without symptoms of infections. Significant bacteriuria is defined as 10<sup>5</sup> lakh organisms per ml of urine of a single uropathogen cultured from a clean voided specimen. These complications insist on regular screening and treatment of asymptomatic bacteriuria in most of pregnant women.

All of these conditions may predispose the patient to develop from an asymptomatic UTI into a symptomatic infection which may cause complications during the gestational period. 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.<sup>6</sup>

Bacterial vaginosis (BV), vulvovaginal candidiasis (VC), and trichomoniasis are accountable near about 90% of cases of infectious conditions like vulvovaginitis, which can lead to eventually gynecological and obstetrical complications such as pelvic inflammatory disease, which can lead to gynecological and obstetrical complications such as pelvic inflammatory disease, chorioamnionitis, premature labour<sup>7,8</sup>.

Many Studies have shown that trichomoniasis is connected with the untimely burst of membranes, low birth weight, postpartum endometritis premature delivery along with stillbirth, and sometimes neonatal death too.<sup>9</sup> Maternal infections of urogenital tract are relatively frequent cause of preterm labour.

Preterm labour (PTL) is defined as “inception of labour with integral membranes after 28 weeks and before 37 weeks of gestation”. It was observed in most of findings 6-8% of all deliveries are preterm and of these about two-thirds occur between 34 and 37 weeks of gestation.<sup>10</sup>

The present study is a baseline urogenital infection prevalence study and it will be useful in future monitoring of intervention programmes like MCH, STI control and prevention of preterm term labour and ultimately to reduce maternal and perinatal mortality. The overall objective of the study is to find out the prevalence and association between urogenital infection and preterm labour by clinically and laboratory investigations respectively among women who are admitted of IPD of Gynaecology at KIMS. This prospective observational study was performed to see the association between preterm labor and urogenital infections with the objectives to correlate the

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**How to cite this article:** GhunageVrishali, Patil Anjali, Nitin Kshirsagar. Urogenital infections – a cause of pre term labor. International Journal of Contemporary Medical Research 2017;4(4):888-891.

association between urogenital infections and preterm labour, to find out prevalence of urogenital infections in preterm labour and to find out prevalence of urogenital infections in full term labour.

**MATERIAL AND METHODS**

This hospital based prospective observational study was conducted to investigate urogenital infection from 01 May 2014 to 31 Dec 2015 at IPD Department of Obstetrics and Gynaecology of Hospital. In this study, total 100 subjects were selected randomly as per inclusion and exclusion criteria. Group A comprised of 50 cases of preterm labour between 28 weeks to less than 37 weeks of gestation while Group B comprised of 50 full term patients.

The institutional ethical clearances were obtained before initiating this study and well inform consent was obtained in the language the patients understood.

**Inclusion criteria**

1. All Antenatal women in the age group of 21-35 yrs.
2. Gestational age confirmed by LMP or USG.
3. Preterm labour was documented according to ACOG criteria-
  - a Regular uterine contractions occurring at a frequency of at least 1 in every 10 mins. synchronizing with pain.
  - b Cervical dilatation greater than 1cm.
4. Threatened Preterm Labour described as 4 uterine contraction in 20 mins or 8 in 60 mins + Cervical dilatation of less than 1 cm
5. PPROM (Preterm premature rupture of membranes)
6. PROM (Premature rupture of membranes)

**Exclusion criteria**

1. Multiple pregnancy
  2. History of Ante partum Hemorrhage
  3. Higher pregnancy order (more than third gravida)
- Patients with genital tract malignancy

Saline Wet Mount	Preterm labour patients Group (n=50)	Full term labour patients Group (n=50)	P value
Bacterial Vaginosis	12(24)	2(4)	<0.01
Candidiasis	5(10)	1(2)	>0.05(0.2)
Trichomoniasis	2(4)	1(2)	>0.05

Figure in Parenthesis indicates percentage.

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

**Study Procedure**

All women were evaluated by detailed history compiled with special emphasis to previous history of preterm labor, obstetric history and urogenital infections. Gestational age was calculated from date of last menstrual period using Naegeles formula or by first ultrasound in the first trimester of pregnancy. Each patient underwent a general physical, systemic per speculum and per vaginum examination along with urine culture, high vaginal swab culture. Samples were taken for microbiological study from posterior fornix of vagina, it were taken with two sterilized swabs under direct vision using Cusco/Sims speculum, it 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 analyzed 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 12(24%) in preterm labour patients and 2 (4%) in full terms. Candidiasis was seen in 5 (10%) pre term patients and single patient in full term, while Trichomoniasis was in 2 (4%) pre term patients and single patient in full term. Statistically it was revealed that there was association in variables as p value is <0.05 in bacterial vaginosis and it is observed that there is no association of Candidiasis and trichomoniasis in preterm labour (table-1)

In urine culture test for micro-organism, infection was present in 11 (22%) preterm labour patients while only 3 (6%) cases in full term labour patients. While in 39 (78%) patients it was shown negative in pre term labour for urine culture while 47(94%) in full term labour patients. It was statistically considerably significant as p value < 0.05.

In this study distribution of various micro-organism found in urine culture in group A 39(n=50) (preterm labour patients) more as compare to group B47 (n=50). In urine culture E coli(6) was the commonest organism found in preterm labour patients while rest were one of each Candida albicans, Enterrococcus Faecalis, Proteus Vulgaris, Staphylococcus Aureus, Pseudomonas Aeruginosa organism (table-2)

In high vaginal swab test, culture was observed positive in 18(36%) preterm labour patients while 6(12%) in full term labour patients. However in 32 (64%) patients it was shown negative in preterm labour and 44 (88%) in full term labour patients. It is statistically significant as p value < 0.01.

Urine	Preterm labour Group n=50	Full term labour patients Group n=50	Chi-Square (X <sup>2</sup> )	P-value	Inference
Positive	11(22%)	3(6%)	4.07	0.05	Significant
Negative	39(78%)	47(94%)			

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

HVS	Preterm labour patients Group n=50	Full term labour patients Group n=50	Chi-Square (X <sup>2</sup> )	P-value	Inference
Positive	18(36%)	6(12%)	6.634	0.01	Significant
Negative	32(64%)	44(88%)			

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

It was observed the distribution of various micro-organism found in high vaginal swab culture in group A 32 (n=50) (preterm labour patients) as well as group B 44(n=50) In genital infection Escherichia coli, Candida albicans and Enterococcus Faecalis was the commonest organism found in preterm labour patients while only one case of Gardnerella vaginalis was seen in full term labour patients group (table 3).

As shown in table-4 urinary tract infection was present in 11 (22%) women in group A while it was only 3 (6%) women had in group B. The difference is statistically significant (<0.01). Similarly genital tract infection was also significantly higher in group A. Combined urogenital infections were also significant in preterm labour patients (table 4).

Statistical analysis reveals that there is association in urine and high vaginal swab positivity as p value obtained was  $p < 0.01$  i.e. significant.

## DISCUSSION

Preterm labour (PTL) is defined as inception of labour with integral membranes after 28 weeks and before 37 weeks of gestation. About 6-8% of all deliveries are preterm and of these about two thirds occur between 34 and 37 weeks of gestation. Prematurity is a one of the most important cause of neonatal and infant morbidity and mortality and many times it occurs unexpectedly in low risk women. Many biochemical (fetal fibronectin) and imaging predictors have been evaluated as screening test of preterm labour in low risk women.

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.<sup>11</sup> Urogenital infections contribute significantly to the preventable causes of preterm labor.<sup>12</sup>

In study by Udaykumar et al.,<sup>1</sup> the Mean age group was 22.88 years in preterm labour while it was 23.82 years in group B. However primipara women were 72% while in group B it was 74%. The detection of C. albicans and T.vaginalis did not have much statistically significant association with PTL.

In study of Indu Verma et al.,<sup>12</sup> maximum numbers of women (80.77%, 42/52) were in the age range of 20–30 years, with primigravida comprising 57.69%

In total 50 preterm labour patients, 23 (46%) patients were having threatened preterm labour, 19 (38%) were having early preterm labour while 8 (16%) were of advanced preterm labour (table-4).

### Prevalence of Urogenital infection

In study of P.Bhalla<sup>13</sup> prevalence of was Urogenital infection seen in urban slum (38.6%) followed by rural (28.8%) and urban middle class community (25.4%), on an average it was 30.93%. Indu verma<sup>12</sup> showed the prevalence of infection seen as 17.3%. In the case group (Group A) of 50 preterm labour patients of PTL 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, 11 preterm labour patients were positive for urine culture, 18 preterm labour patients were found positive in high vaginal swab culture and 5 having both type of infection in

Type of Infection	Preterm labour patients	Full term labour patients	P value
Urinary tract infection (Urine + ve)	11 (22%)	3(6%)	<0.01
Genital tract infection (HVS + ve)	18 (36%)	6(12%)	<0.01
Urogenital infection (Both)	5 (10%)	1(2%)	<0.01

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

preterm labour patients. While in full term labour patients group it was 03, 06 and 01 respectively. It was observed that there was positive urine culture present in 11(22%) patients of preterm labour patient's group while 03 (06%) in full term labour patient's. High vaginal swab culture positive was observed in 18 (36%) preterm labour patients and 6(12%) in full term labour patient's. Combined urogenital infections were present in 5 (10%) preterm labour patients while only single case in full term labours patients. Overall 34% prevalence of urogenital infection was observed in this study.

## CONCLUSION

Prematurity is a most important cause of neonatal and infant morbidity as well as mortality and several times it happens unexpectedly in low risk women. Many biochemical and imaging predictors have been evaluated as screening test of preterm labour in low risk women.

Due to the fact that urogenital infections cause preterm labor and often asymptomatic early screening and treatment are necessary to reduce mortality and morbidity resulting from premature labour and birth. Urinary tract infections (UTI) during pregnancy were common causes of serious maternal morbidity and perinatal morbidity. This morbidity can be limited with appropriate screening and treatment of UTI.

It is concluded from study that in our study, urogenital infection was 3.77 times (34%) more in women with preterm labor compared to those in full term labour patients group (9%), which indicates a significant association of urogenital infections in preterm labor.

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**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 30-03-2017; **Accepted:** 22-04-2017; **Published:** 05-05-2017