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Original Research Article

## A study to establish the prevalence of urinary tract infection in preterm labour

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### ABSTRACT

**Background:** Urinary tract infection (UTI) is one of the many etiological factors of preterm labour. Preterm labour is the onset of labour after 28 weeks and before 37 weeks of gestation. Preterm labour is a significant cause for perinatal morbidity and mortality. Hence early diagnosis and management of etiological factors is necessary. The most common bacterial infection encountered during pregnancy is UTIs. Early detection and management of UTIs may effectively prevent complications of preterm labour including preterm birth. Aims and objectives of the study was to estimate the prevalence of UTIs in preterm labour.

**Methods:** cross sectional study with a total of 250 patients carried out in the department of obstetrics and gynaecology, Vanivilas hospital, BMCRI for a period of 6 moths-Aug 2019-Feb 2020. Patients in preterm labour i.e., cervical dilatation  $\geq 1$  cm, cervical effacement  $\geq 80\%$  with true labour pains were included in the study after taken informed consent form the patient. Detailed clinical history including age of patient, level of education, duration of antenatal care, parity, and obstetrical history was taken. Gestational age was calculated by LMP or early ultrasound. General examination, systemic examination and obstetric examination was done. Routine investigations were done along with clean catch midstream urine sample in a sterile container. Two samples were collected: 1<sup>st</sup> sample for microscopic examination, 2<sup>nd</sup> sample for culture and sensitivity.

**Conclusions:** Untreated UTI can be associated with obstetric complications. The most common bacterial infection during pregnancy is UTIs. All women should be screened for UTI at the first antenatal visit. Once diagnosed it should be promptly treated with suitable antibiotic which is sensitive yet safest.

**Keywords:** UTI, Preterm labour, Bacteriuria, Urine culture sensitivity, Urine routine

### INTRODUCTION

The perinatal morbidity and mortality are 2-7 times more than that of term pregnancy. Preterm neonate suffers many complications during and after delivery. Hence early diagnosis and management of etiological factors is necessary. Preterm births are multifactorial in origin. Chorioamnionitis, UTI, anatomical defect of uterus, placental abnormalities and defect in conceptus are the important known causes of preterm labour. Hydramnios,

multiple pregnancy, malpresentation, serious maternal disease, psychological problems are other etiological factors. The most common bacterial infection encountered during pregnancy is UTIs. Dilatation of urinary collecting system, mechanical obstruction of ureter and bladder by the gravid uterus causing hypotonia, congestion and some degree of vesicoureteric reflux (VUR) are few of the gestational changes in the urinary tract which lead to increased predisposition of UTI in pregnancy. Bacteriuria causes preterm labour by a mechanism involving placental

and decidual lysosomal breakage with liberation of enzymes capable of increasing local prostaglandin production.

UTI is diagnosed by clinical findings of bacteriuria (bacteria in midstream urine in counts of >10<sup>5</sup> colony forming units (cfu)/mL) along with symptoms reported by the patient.<sup>1</sup> Cystitis in pregnancy is associated with increased risk of maternal hypertension, anaemia, amnionitis, preterm labour and low birth weight.<sup>2</sup> In developed countries where routine screening and treatment of bacteriuria in pregnancy is done, only a small percentage of pregnant women progress to pyelonephritis.<sup>3</sup>

In majority of cases (70 to 90%), *Escherichia coli* is the causative organism.<sup>4</sup> *Kebsiella*, *Proteus mirabilis*, Coagulase negative *Staphylococci*, *Pseudomonas* and Group B *Streptococci* are the other organisms isolated from infected urine. Asymptomatic bacteriuria occurs in 2 to 10% of pregnant women and symptomatic UTIs including cystitis and pyelonephritis may complicate around 4% of pregnancies.<sup>5,6</sup> More importantly 25 to 40% of asymptomatic patients eventually develop symptom if they remain untreated.<sup>6</sup> Hence early detection and management of UTIs may effectively prevent complications of preterm labour including preterm birth.

#### Aims and objectives

Aims and objectives of the study was to estimate the prevalence of UTIs in preterm labour.

#### METHODS

Cross sectional study with a total of 250 patients carried out in the department of obstetrics and gynaecology, Vanivilas hospital, BMCRI for a period of 6 months-Aug 2019-Feb 2020. Patients in preterm labour i.e., cervical dilatation more than 1 cm, cervical effacement more than 80% with true labour pains were included in the study after taken informed consent form the patient. Detailed clinical history including age of patient, level of education, duration of antenatal care, parity, obstetrical history was taken. Gestational age was calculated LMP or early ultrasound. General examination, systemic examination and obstetric examination was done. Routine Investigations were done along with clean catch midstream urine sample in a sterile container. Two samples were collected: 1<sup>st</sup> sample for microscopic examination, 2<sup>nd</sup> sample for culture and sensitivity. Diagnosis of UTI was based on clinical findings of bacteriuria (bacteria in midstream urine) with bacterial colony counts of >10<sup>5</sup> colony forming units (cfu)/mL along with symptoms reported by the patient.

#### Exclusion criteria

Cases with uterine anomalies and congenital anomalies of fetus, cases of intrauterine fetal death, cases with chronic systemic diseases like uncontrolled hypertension, diabetes,

nephritis and decompensated heart lesions, induced preterm labour and patients who were already on antibiotics were excluded from the study.

#### RESULTS

##### Age distribution

Majority of our patients were in the age group between 26-30 years. Least belonged to the age group between 36-40 years. 92 patients were of the age group 20-25 years. 31-35 years group had 49 patients.

**Table 1: Age distribution.**

Age (Years)	No. of patients
20-25	92
26-30	102
31-35	49
36-40	7

##### Parity

Gravida 2 was the most common parity on our study. Next common group was G3. Lowest was primi and G4.

**Table 2: Obstetric score distribution.**

Parity	No. of patients
Primi	26
G2	143
G3	54
G4	27

##### Educational status

Literate patients were slightly lower than the Illiterate patients contributing to 108 and 142 respectively.

**Table 3: Educational status.**

Educational status	No. of patients
Literate	108
Illiterate	142

##### Background

Rural population in our study was contributed by 77 patients and 173 by urban population.

**Table 4: Location of patients.**

Background	No. of patients
Urban	173
Rural	77

##### Socio economic status

Most of our study patients belonged to middle class. Lower class were 29. Very few patients were from the upper class.

**Booked**

The 29 patients were un-booked. Whereas 221 patients were booked.

**Table 5: Socioeconomic status.**

Socio economic status	No. of patients
Upper	18
Middle	203
Lower	29

**Table 6: Booking status.**

Variables	No. of patients
Booked	221
Un-booked	29

**Period of gestation**

The 27 patients had preterm labour between 28-30 weeks. 30+1-34 weeks.

**Table 7: Gestational age.**

Period of gestation (Weeks)	No. of patients
28-30	27
30 +1-34	58
34+1-37	165

**Urine routine examination**

The 29.2% was contributed by UTI as a cause of preterm labour in our study.

**Table 8: Urine analysis.**

Urine routine examination	No. of patients
UTI	73
Within normal limits	177

**Asymptomatic and symptomatic UTI**

Among the 73 patients found to have UTI, 57 patients were asymptomatic. A very few patients (16) had symptoms.

**Table 9: symptom distribution.**

Variables	No. of patients
Asymptomatic	57
Symptomatic	16

**Presenting symptoms in symptomatic UTI**

Among the 16 patients with symptomatic UTI, most common symptom was burning micturition. The other common symptoms were pain at supra pubic region, pain

during micturition, increased frequency of urination with burning micturition. Less common symptoms were fever with chills and Incomplete voiding of urine.

**Table 10: Presenting symptoms.**

Symptoms	No. of patients
Burning micturition	7
Pain at supra pubic region	2
Pain during micturition	2
Increased frequency of urination with burning micturition	3
Fever with chills	1
Incomplete voiding of urine	1

**Table 11: Culture report.**

Commonest organism	No. of patients
<i>E. coli</i>	29
<i>S. Aureus</i>	10
Coagulase negative staph	13
<i>Klebsiella</i>	17
GBS	4

**Urine culture report**

Commonest organism grown was *E. coli* least was GBS. *S. Aureus*, coagulase negative staph, *Klebsiella* were the other organism grown

**DISCUSSION**

Preterm labour is a leading cause of neonatal morbidity and mortality worldwide. WHO has estimated that 9.6 % of all births (about 13 million) in 2005 were pre-term. Africa and Asia accounted for almost 11 million.<sup>7</sup> Evidence suggests that infection plays a role in pathogenesis of preterm labour and delivery.<sup>8</sup> Lockwood reported that an estimated 50% of spontaneous preterm births were associated with UTI.<sup>9</sup> In our study 29.2% of patients had preterm labour with UTI. In 2001, Chhabra and Patil reported that 28% of patients in preterm labour had positive urine culture which was found in our study too (29%).<sup>10</sup> It has been proven by in vivo and in vitro studies that UTIs leads to preterm labour.<sup>11-13</sup> Hence conducting this study was importance to know the prevalence of UTI causing preterm labour in our population.

In our study majority of patients were in the age group of 26-30 years, gravida 2 was the most common parity similar to that of Pandey et al study.<sup>14</sup> Literacy rate had no statistical value. Majority of our patients were from urban background similar to McPheeters et al study.<sup>15</sup> 88.4 % of our patients were booked. 34+1-37 weeks had the highest percentage of preterm labour with UTI-66% similar to that of Davidson et al study.<sup>5</sup> Commonest microorganism isolated in urine culture was *E-coli* similar to Chhabra and

Patil.<sup>10</sup> In the case study, overall UTI was detected in 29.2% which was 2.67 times more than the other women delivering at term. Our observations are similar to the results of Pandey et al.<sup>14</sup>

In pregnancy, asymptomatic UTI is very common, and is linked with preterm delivery. In our study, asymptomatic UTI was 78%. Among the symptoms burning micturition was the commonest symptom 43%. If bacteriuria without symptoms is not treated in pregnant women, then it may lead to acute cystitis and pyelonephritis in 20-40 % of cases. In 1989, Romero et al concluded in their study that non-bacteriuric patients had only about two-third the risk of low birth weight and half the risk of preterm delivery compared to those with untreated symptomatic bacteriuria, and that antibiotic treatment reduced the risk of low birth weight.<sup>16</sup> Recognizing and treating the patients having genitourinary infections at a point, when it has not become clinically noticeable, will reduce the number of patients going into preterm labour resulting in decreased morbidity and mortality in the neonates born to such mothers.

## CONCLUSION

Diagnosing and treating infections associated with preterm labour represent a very attractive area for interventions to prevent dire neonatal outcome. This prospective case-control study was designed to see the association between preterm labour and UTIs.

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