

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

Sweta Lal<sup>1\*</sup>, Snehlata<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Obstetrics and Gynecology, Hazaribagh Medical College, Hazaribagh, Jharkhand, India

<sup>2</sup>Specialist, Department of Obstetrics and Gynecology, Hazaribagh Medical College, Hazaribagh, Jharkhand, India

Received: 26-10-2021 / Revised: 06-12-2021 / Accepted: 05-01-2021

### Abstract

**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. **Materials and Methods:** A cross sectional study was conducted at Department of Obstetrics and Gynecology, Hazaribagh Medical College, Hazaribagh from January 2020 to December 2020 (1 year). Detailed clinical history including age of patient, level of education, duration of antenatal care, parity, obstetrical history was taken. Gestational age was calculated from menstrual history from the first day of the last menstrual period in a 28 days cycle and/or early ultrasound examination. General examination, systemic examination and obstetric examination were done. Investigations such as Hb, Total leucocyte count, Blood sugar, Blood grouping, HIV, Hbsag, VDRL were carried out. Clean catch midstream urine samples were collected from all patients in a sterile container. Two samples were thus collected: 1st sample for microscopic examination, 2nd sample for culture and sensitivity. **Results:** Out of 264 cases of preterm labour studied the prevalence of UTI in preterm labour was 30.1%. Majority of respondents were between age 25-29 years which was 49.4%. Most of the patients were booked as in 77.2% of cases. Around 91.8% were from rural background. Around 75.9% belonged to the lower socio-economic class. It was found in my study that UTI was more prevalent in multipara. Prevalence of UTI among illiterates was as high as 92.4%. Majority of the respondents belonged to late preterm with period of gestation from 34 to 37 weeks. E-coli were the most common organism isolated in urine culture which accounted for 69% of the samples. Out of the cases studied only 1.3% were complicated by pyelonephritis. **Conclusion:** It can be concluded that all pregnant women should be screened for UTI and treated with appropriate antibiotics if the culture is positive and then retested for cure to prevent complications. In addition, health education to all pregnant females specifically those of low socio-economic class will help in preventing urinary tract infections.

**Key Words:** Chorioamnionitis, UTI, anatomical defect of uterus, placental abnormalities, pyelonephritis.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

### 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[1]. 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[2].

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[3].

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[4]. Cystitis in pregnancy is associated with increased risk of maternal hypertension, anaemia, amnionitis, preterm labour and low birth weight. In developed countries where routine screening and treatment of bacteriuria in pregnancy is done, only a small percentage of pregnant women progress to pyelonephritis[5].

In majority of cases (70 to 90%), Escherichia coli is the causative organism. Klebsiella, 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. More importantly 25 to 40% of asymptomatic patients eventually develop symptom if they remain untreated[6].

Hence 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.

### Materials and methods

#### Study design

A cross sectional study

#### Study location

Department of Obstetrics and Gynecology, Hazaribagh Medical College, Hazaribagh.

\*Correspondence

Dr. Sweta Lal

Assistant Professor, Department of Obstetrics and Gynecology, Hazaribagh Medical College, Hazaribagh,, India.

E-mail: [drsweta2004@gmail.com](mailto:drsweta2004@gmail.com)

**Study duration**

January 2020 to December 2020 (1 year).

**Study Population**

Women with spontaneous preterm labour admitted in the department of Obstetrics and Gynaecology, Hazaribagh Medical College, Hazaribagh who fulfill the inclusion criteria and exclusion criteria.

**Inclusion criteria**

Patients in preterm labour that is, those patients who are less than 37 weeks of gestation and more than the period of viability with regular uterine contractions occurring once in every 5-8 minutes or less accompanied by one or more of the following:

1. Progressive changes in cervix.
2. Cervical dilatation of more than or equal to 1cm.
3. Cervical effacement of more than or equal to 80%.

**Exclusion Criteria**

1. Cases with uterine anomalies and congenital anomalies of fetus.
2. Cases of intrauterine fetal death.
3. Cases with chronic systemic diseases like uncontrolled hypertension, diabetes, nephritis and decompensated heart lesions.
4. Induced preterm labour.
5. Patients who were already on antibiotics.

**Procedure**

Detailed clinical history including age of patient, level of education, duration of antenatal care, parity, obstetrical history was taken. Gestational age was calculated from menstrual history from the first

day of the last menstrual period in a 28 days cycle and/or early ultrasound examination. General examination, systemic examination and obstetric examination were done. Investigations such as Hb, Total leucocyte count, Blood sugar, Blood grouping, HIV, Hbsag, VDRL were carried out. Clean catch midstream urine samples were collected from all patients in a sterile container. Two samples were thus collected: 1st sample for microscopic examination, 2nd sample for culture and sensitivity.

**Results**

A cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Hazaribagh Medical College, Hazaribagh from January 2020 to December 2020 among 264 cases of preterm labour to determine the prevalence of UTI in preterm labour in relation to selected variables of interest like age, parity, socio economic class, literacy and background. Most common organism isolated was studied in addition to the number of cases complicated by pyelonephritis.

Out of 264 cases of preterm labour studied the prevalence of UTI in preterm labour was 30.1%. Majority of respondents were between age 25-29 years which was 49.4%. Most of the patients were booked as in 77.2% of cases. Around 91.8% were from rural background. Around 75.9% belonged to the lower socio-economic class. It was found in my study that UTI was more prevalent in multipara. Prevalence of UTI among illiterates was as high as 92.4%. Majority of the respondents belonged to late preterm with period of gestation from 34 to 37 weeks. E-coli were the most common organism isolated in urine culture which accounted for 69% of the samples. Out of the cases studied only 1.3% were complicated by pyelonephritis.

**Table 1: Urine routine examination**

S.No	Urine routine examination	Frequency	Percentage
1	UTI	79	30%
2	Within normal limits	185	70%
3	Total	264	100%

**Table 2: Educational Status**

S.No	Educational Status	Frequency	Percentage
1	Illiterate	73	92.4%
2	Literate	6	7.6%
3	Total	79	100%

**Table 3: Background**

S.No	Background	Frequency	Percentage
1	Rural	73	91.8%
2	Urban	6	8.2%
3	Total	79	100%

**Table 4: Socioeconomic status**

S.No	Socioeconomic status	Frequency	Percentage
1	Lower	60	75.9%
2	Middle	16	20.9%
3	Upper	3	3.2%
4	Total	79	100%

**Table 5: Parity**

S.No	Parity	Frequency	Percentage
1	G4	26	33.5%
2	G3	15	19%
3	G2	25	31%
4	Primi	13	16.5%
5	Total	79	100%

**Table 6: Urine culture and Sensitivity**

S.No	Organism isolated	Frequency	Percentage
1	E.Coli	55	69%

2	S.Aureus	8	10%
3	Coagulase negative Staph	9	11%
4	Klebsiella	3	3.8%
5	GBS	4	
6	Total	79	100%

**Table 7: Period of gestation**

S.No	Period of gestation	Frequency	Percentage
1	28-30	3	3.2%
2	30-34	11	14.7%
3	34-37	65	82.1%
4	Total	79	100%

**Table 8: Booking status**

S.No	Booking status	Frequency	Percentage
1	Booked	61	77%
2	Unbooked	18	23%
3	Total	79	100%

**Table 9: Complications**

S.No	Complications	Frequency	Percentage
1	No complication	78	98.7%
2	Pyleonephritis	1	1.3%
3	Total	79	100%

**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. Evidence suggests that infection plays a role in pathogenesis of preterm labour and delivery. Lockwood reported that an estimated 50% of spontaneous preterm births were associated with UTI[7]. In our study 30% 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%). It has been proven by in vivo and in vitro studies that UTIs leads to preterm labour. Hence conducting this study was importance to know the prevalence of UTI causing preterm labour in our population[8].

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%[9]. 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[10]. 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**

The most common bacterial infection during pregnancy is urinary tract infection. Untreated UTI can be associated with obstetric complications. The prevalence of bacteriuria among the pregnant women with preterm labour was 30%. The results prove that there exists an association between gestational age, education, age and

socio-economic strata with bacteriuria. Hence It can be concluded that all pregnant women should be screened for UTI and treated with appropriate antibiotics if the culture is positive and then retested for cure to prevent complications. In addition, health education to all pregnant females specifically those of low socio-economic class will help in preventing urinary tract infections.

**References**

1. Schnarr J, Smaill F. Asymptomatic bacteriuria and symptomatic urinary tract infections in pregnancy. *Eur J Clin Investig.* 2008;38(2):50-7.
2. Gratacos E, Torres PJ, Vila J, Alonso PL, Cararach V. Screening and Treatment of Asymptomatic Bacteriuria in Pregnancy Prevent Pyelonephritis. *J Infect Dis.* 1994;169(6):1390-2.
3. Sharma P. Acute pyelonephritis in pregnancy: A retrospective study. *Aust N Z J Obstet Gynaecol.* 2007;47(4):313-5.
4. Davidson J, Baylis C. *Medical Disorders in obstetric Practice* 3rd edition, Blackwell Scientific Oxford. 1995;2549.
5. Lucas MJ, Cunningham FG. Urinary Infection in Pregnancy. *Clin Obstet Gynecol.* 1993;36(4):855-68.
6. Beck S, Wojdyla D, Say L. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bull World Health Organ.* 2010;88:31.
7. Romero R, Gomez R, Chaiworapongsa T. The role of infection in preterm labour and delivery. *Paediatr Perinat Epidemiol.* 2001;15(2):41-56.
8. Lockwood CJ. Predicting premature delivery-no easy task. *N Eng J Med.* 2002;346:282-4.
9. Chhabra S, Patil N. Study of factors causing and arresting preterm labour. *J Obstet Gynecol India.* 2001;51:99-103.
10. Keelan JA, Blumenstein M, Helliwell RJA. Cytokines, prostaglandins and parturition-a review. *Placenta.* 2003;17:S33-46.

**Conflict of Interest: Nil****Source of support: Nil**