

## Urinary Tract Infection in Pregnancy: a Clinical Problem

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Urinary tract infection (UTI) in pregnancy is a common clinical problem which causes morbidity and, in a small minority of cases, renal damage and chronic renal failure. Upto 50% of women have a urinary tract infection (UTI) at sometime. The prevalence of UTI in women is about 3% at the age of 20, increasing by about 1% in each subsequent decade. In males UTI is uncommon, except in first year of life and in men over 60, in whom urinary tract obstruction due to prostatic hypertrophy may occur. Enterobacteriaceae and other organism like pseudomonas, and staphylococcus epidermidis were causing UTI. A retrospective study was done in 1664 pregnant women with different trimesters (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>) who attended the Obst & Gynae Out patient department of Rafatullah Community Hospital attached to TMSS Medical College for antenatal checkup from July 2009 to December 2009. Most of them were between the age of 16 to 25 years. They came from rural areas of Thengamara, Gokul, Bogra with ill health and poor socio-economic conditions. After taking proper history, clinical examination and laboratory investigations, 200 cases (33.3%) were diagnosed as a case of urinary tract infection (UTI). Apart from routine blood examination and urine analysis, serum level of urea, creatinine, culture and sensitivity studies of urine were done. Blood examination revealed high count of white blood cells with predominance of neutrophils. Urine analysis showed numerous pus cells and in culture, organisms were mostly Escherichia coli (75%). Other organisms such as Klebsiella, Proteus, Pseudomonas and Staphylococcus epidermidis were also seen. Serum level of urea and creatinine were within normal limit.

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**Key words:** Pregnancy, urinary tract infection, a clinical problem.

### Introduction

Urinary tract infection is defined as multiplication of organisms in the urinary tract. It is usually associated with presence of neutrophils and  $> 10^5$  organisms per milliliter in mid stream sample of urine.<sup>1</sup> The organisms causing UTI in community include: a) Escherichia coli (about 75% of infection) b) Proteus c) Klebsiella spp d) Pseudomonas spices d) Strepto cocci e) Staphylococcus epidermidis

In women, the ascent of organisms into the bladder is easier than in men because of the relatively short urethra and absence of bactericidal prostatic secretions. Sexual intercourse may cause minor urethral trauma and transfer bacteria from the perineum into the bladder. Instrumentation of the bladder may also introduce organisms. UTI is more common in primigravidae than multiparae, previous history of UTI increases the chance by 50%, presence of asymptomatic bacteriuria increases the chance by 25%, abnormality in the renal tract is found in about 25%.<sup>2</sup>

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The conditions which predispose to UTI or the risk factors for UTI (urinary tract infection) are

#### Incomplete bladder emptying

- Bladder out flow obstruction
- Neurological problems eg. Multiple sclerosis, diabetic neuropathy.
- Gynaecological abnormalities eg. Uterine prolapse.
- Vesico-ureteric reflux

#### Foreign bodies

- Urethral catheter or Ureteric stent

#### Loss of host defense

- Atrophic urethritis and vaginitis in post menopausal women.<sup>1</sup>

After 18<sup>th</sup> weeks of gestation, compression of the ureters by the uterus at the level of pelvic brim is another factor contributing to dilation and stasis of urine. Ureteral peristalsis and bladder tone also reduce in pregnancy. Vesicoureteral reflux, history of recurrent UTI, diabetes mellitus, hyper-uricaemia also are important predisposing factors for UTI.<sup>3,4,5</sup> Because of these changes the frequency and the severity of UTI increases in pregnancy. The 16<sup>th</sup> week is the optimal time for a single screen of bacteriuria. It is estimated that 10 to 20% of all women will suffer acute infection of the urinary tract at some point of their life time. About 2-10% of young women are susceptible to asymptomatic bacteriuria in pregnancy on routine screening and UTI complicates 1-3% of all pregnancies.<sup>6</sup> In Pregnancy UTI carries risk of foetal loss, pre-term labour, intrauterine growth retardation, maternal anaemia and also the chance of recurrent infections.

This study was carried out in 1664 pregnant women who attended the Obst. & Gynae Out patient Department of Rafatullah Community Hospital attached to TMSS Medical College with the complains of high frequency of micturation, pain in lower abdomen, intense desire to pass more urine after micturation,

fever with loss of appetite. Most of them had shallow knowledge about the antenatal care during pregnancy and they prefer to delivery themselves at home by untrained Dias (Traditional Birth Attendants).

#### Methods

The pregnant women of different trimester who came for antenatal checkup were sent to the pathology and microbiology Department of Rafatullah Community Hospital for Routine blood examination, urine analysis, estimation of serum level of urea, creatinine and culture and sensitivity studies of urine. Blood examination revealed high count of white blood cells with predominance of neutrophils, Urine analysis demonstrated white blood cell (pus cell) too numerous to count with presence of red blood cells. Blood urea and creatinine level were within normal limit.

Blood agar, nutrient agar and MacCon-Key's agar media were used for culture and sensitivity studies of urine. The Presence of more than 10<sup>5</sup> colonies per milliliter of urine was taken as a case of UTI. The organisms were identified by their growth character, colony morphology, gram staining, motility test and other biochemical characteristic. In urine culture most of the organisms identified were Esch. coli (75%), other organisms such as Klebsiella (10%) Pseudomonas (10%), Proteus (2.5%) and Staphylococcus epidermidis (2.5%)

## Results

A total number of 200 pregnant women of different trimester were diagnosed as a case of urinary tract infection (UTI). Of them primigravidae was more than 2<sup>nd</sup> and 3<sup>rd</sup> gravidae.

Table I: Pregnancy status of patients  
n=200

Gravida	No. of patient's	Percentage (%)
Primigravidae	100	50%
2 <sup>nd</sup> Gravidae (Gravida 2)	60	30
3 <sup>rd</sup> gravida (Gravida 3)	40	20

The predominant uropathogen isolated from the culture was *Escherichia coli*. Others were *Klebsiella*, *Pseudomonas*, *Proteus* and *Staphylococcus epidermidis*

Table II: Isolated bacteria from culture  
n=200

Bacteria	Total number of Patients	Percentage (%)
<i>Escherichia coli</i>	150	75
<i>Klebsiella</i> spp	20	10
<i>Pseudomonas</i> species	20	10
<i>Proteus</i>	5	2.5
<i>Staphylococcus epidermidis</i>	5	2.5

In table II *Esch. coli* was isolated as a predominant organisms (75%) followed by *Klebsiella* spp (10%), *Pseudomonas* (10%), *Proteus* (2.5%) and *staphylococcus epidermidis* (2.5%).

Table III: Antimicrobial agents and sensitivity pattern of isolated bacteria

Name of Antimicrobial agents	Name of Bacteria with sensitivity pattern				
	<i>Esch.coli</i>	<i>Kleb. spp</i>	<i>Pseudo-monas</i>	<i>Prote-us</i>	<i>Staph. epidermidis</i>
AML	MS	MS	WS	WS	WS
FLU	MS	MS	MS	MS	MS
GMN	SS	SS	SS	MS	MS
NFN	MS	MS	MS	MS	R
CRD	SS	SS	MS	MS	MS
CEP	MS	MS	WS	WS	WS
CXM	SS	SS	SS	SS	SS

Antimicrobial agents:

AML= Amoxicillin, FLU= Flucloxacillin.

GMN= Gentamycin, NFN = Nitrofurantion.

CRD=Cephadrine, CEP = Cephalexin.

CXM= Cefuroxime.

Sensitivity pattern:

WS= weakly sensitive; MS = moderately sensitive; SS = strongly sensitive, R=Resistant.

Table III shows that *Esch. coli* is mostly sensitive to GMN, CRD and CXM; *Klebsiella* to GMN and CXM; *Pseudomonas* to GMN & CXM; *Proteus* CXM and *staph. epidermidis* to CXM.

## Discussion

Urinary tract infection in pregnancy is a common clinical problem in rural areas. This study provided some important features of the pregnant women, especially of their socio-economic condition and nutritional status. Different studies showed that early and intensive sex, ignorance of sex hygiene, repeated pregnancies and deliveries, abortions, bacterial vaginosis and anogenital infections are associated with urinary tract infections.<sup>7</sup> One study showed that 11.8% of bacteriuric women develop symptoms of UTI during pregnancy, whereas only 3.2% of women with sterile urine an initial screening did so and suggested that the 16<sup>th</sup> week is the optimal time for a single screen of bacteriuria.<sup>8</sup> Respiratory distress were found

in two cases. Majority of the patients were primigravidae (50%) with 16 years of age. They were anaemic with haemoglobin level between 7.5–9.5 gm/dl of blood. Routine blood examination revealed high WBC count with predominance of neutrophils. Blood film study of them showed microcytic hypochromic anaemia due to deficiency of iron. Urine analysis demonstrated numerous pus cells in urine. Serum level of urea and creatinine were within normal limit. Urine culture was positive for *Esch. coli* (75%) followed by *Klebsiella* (10%), *Pseudomonas* (10%), *Proteus* (2.5%) and *Staphylococcus epidermidis* (2.5%). *Esch. coli* comprised 55.5% of uropathogens isolated by Gupta et al in a large study of 1410 patients of UTI.<sup>9</sup> In sensitivity testing, gentamycin, cephradine and cefuroxime were shown highly sensitive.

### Conclusion

It is obvious from this limited study that urinary tract infection in pregnancy may result in significant morbidity. To minimize the complication of pregnancies, regular antenatal care should be taken and to ensure a normal pregnancy with delivery of a healthy baby from a healthy mother. The pregnant women should be educated about the physiology of pregnancy and to motivate the couple about the need of family planning.

### References

1. Davidson's principles & practice of Medicine 20<sup>th</sup> ed, Edinburgh, 2006, P-467 – 470
2. Text Book of OBSTETRIC DC Dutta, 6<sup>th</sup> ed  
Calcutta, India 2004, P-296
3. Shabad AL, Minakov NK, Mkrtchan GG. The Pathogenesis and prevention of urinary tract infection in women *Urol, Nefro, Mosk.* 1995 (4): 8-12
4. Belman AB. A prespective on vesicoureteral reflux. *Urol, Clin, North Am* 1995; 22(1):139-50.
5. BSP Ang. Urinary tract infections. *Singapore Med J* 1995: 36: 314-17.

6. Linda Hillebrand. Ozgur H. Harmanli, Valerie Whiteman, Meena Khandelwal. Urinary tract infections in pregnant women with bacterial vaginosis. *Am J Obs Gynecol* 2002; 186(5): 916-17.
7. Berg E. Benson DM. Haraszkiwicz P. Grieb J. MC Donated J. *Acad Emerg Med* 1996; 3(11): 1030-34.
8. Davison JM, Dunlop Willtam. Urinary tract in pregnancy In: Chamberlain G, Steer PJ. (eds). *Turnbull's Obstetrics*. 3<sup>rd</sup> ed. London: Churchill Livingstone: 2001. P 383-401.
9. Gupta V, Yadav A, Joshi, RM Antibiotic resistance pattern in Uropathogens. *India J Med Microbiol* 2002; 20: 96-98.