PREVALENCE OF URINARY TRACT INFECTION IN PREGNANT WOMEN IN KATIHIR DISTRICT, BIHAR

Tarannum Yasmin1, M. Yousuf Sarwar2, Aninda Sen3

1Professor, Department of Microbiology, Katihar Medical College, Katihar.
2Associate Professor, Department of Anatomy, Katihar Medical College, Katihar.
3Professor, Department of Microbiology, Katihar Medical College, Katihar.

ABSTRACT

BACKGROUND
Urinary tract infections (UTI) are the common bacterial infections during pregnancy. It may involve the lower urinary tract or bladder. The majority of UTI occur due to ascending infection. Untreated UTI can be associated with serious obstetric complications.

The aim of this study was to examine the prevalence of UTI, proper screening and treatment of pregnant women is necessary to prevent complications.

MATERIALS AND METHODS
This study included 350 cases of pregnant women over a period of 1 year. UTI was diagnosed using mid-stream (MSU) culture using > 10⁵ colony forming unit per millilitre as a significant level of bacteriuria.

RESULTS
A total of 350 samples were processed during the study period, of which 98 cases showed significant growth making prevalence of 28%. There was a high incidence in 21 - 25 years' age group (48.97%). There was also high incidence of infection in the third trimester of pregnancy (73.46%) compared to first (7.14%) and second trimester (19.38%). Multiparity is associated with increased urinary tract infection in pregnancy.

CONCLUSION
The present study shows the prevalence rate of 28% of UTI among pregnant women. These findings underscore the importance of screening of all pregnant women for significant bacteriuria, so that positive cases should be treated subsequently with antibiotics in order to reduce the adverse effects on both maternal and foetal health.

KEYWORDS
Prevalence, Pregnant Women, UTI, Bacteriuria.


REFERENCE

Financial or Other Competing Interest: None.
Corresponding Author:
Dr. M. Yousuf Sarwar,
Department of Anatomy
Katihar Medical College
Katihar- 854105,
Bihar
E-mail: drmysarwar@gmail.com
DOI: 10.14260/jemds/2018/82

In recent years bacteriuria of pregnancy has drawn attention of obstetricians all over the world, because of its effects on mother and foetus. Pregnant women are at
increased risk for UTIs. Beginning in 6 weeks which peaks during 22 - 26 weeks, and continues to persist until delivery. This is also known as “hydronephrosis of pregnancy.” Both progesterone and oestrogen levels increase during pregnancy and these will lead to decreased ureteral and bladder tone. Increased plasma volume during pregnancy leads to decreased urine concentration and increased bladder volume. The combination of all these factors lead to urinary stasis and ureterovesicle reflux. Additionally, the apparent reduction in immunity of pregnant women appears to encourage the growth of both commensal and non-commensal microorganisms.

Increased age, number of childbirths, number of intercourses per week, diabetes, reflux, previous history of UTI, immunodeficiency and urinary tract abnormalities can increase the risk of UTI in pregnant women. Bacterial organisms which cause this disease include Escherichia coli, Klebsiella pneumonia, Proteus, Acinetobacter, Staphylococcus saprophyticus, Group B streptococci and Pseudomonas aeruginosa.

The purpose of this study was to examine the prevalence of UTI, proper screening and treatment of pregnant women is necessary to prevent complications.

### MATERIALS AND METHODS

The study was conducted over a period of 1 year from June 2016 to May 2017 in the Department of Microbiology, Katihar Medical College and Hospital, Katihar, Bihar, India. Antenatal women who presented at the antenatal clinic during the study period were randomly recruited into the study upon verbal informed consent; either had any of the symptoms suggestive of urinary tract infections or without any symptoms was included. Pregnant women having renal disease or an antibiotic therapy within 72 hours to the study days were excluded. Pregnant women having renal disease or an antibiotic therapy within 72 hours to the study days were excluded due to the fact that the antibiotic must have inhibited or destroyed the pathogens. 350 pregnant women with or without symptoms of UTI were included in this study. Verbal informed consent was obtained from each woman before the commencement of the research. Socio-demographic data such as age, occupation, parity and duration of gestation were collected from the pregnant women using standard questionnaires and kept confidential during the research.

Early morning clean-catch midstream urine was collected from each pregnant woman into a wide-mouthed sterile screw-capped container. With a Calibrated micro-loop 0.001 mL of urine was cultured on to a Blood agar and a MacConkey agar plate. After overnight incubation at 37°C for 24 hours, colony counts yielding bacterial growth of ≥ 10^5/mL was taken as being significant in both symptomatic and asymptomatic pregnant women. Centrifuged urine deposit was examined microscopically at high magnification for pus cells, red blood cells, epithelial cells, casts, crystals and yeast-like cells. After the bacteria are isolated, colony counting will be done in colony counter. If significant number of bacteria is found it will be biochemically confirmed. The isolate if found positive, pathogen will be processed for antibiotic susceptibility testing by Kirby and Bauer’s method with the commonly used antibiotics and chemotherapeutic agents.

Antibiotics used are amoxicillin, amoxyclav, amikacin, gentamicin, imipenem, ceftriaxone, cefuroxime, nitrofurantoin, cefazidime, pipericillin + tazobactam, cefazolin and clindamycin.

### RESULTS

Three hundred and fifty (350) urine samples were collected and analysed during the study period, in which 252 samples showed no growth and 98 samples showed significant growth making prevalence of 98/350 (28%) [Table 1].

The prevalence of infection in relation to age are shown in [Table 2], individuals of age group 21 - 25 years had the highest incidence of infection 48/98 (48.97%) followed by age group 26 - 30 years 36/98 (36.73%), 31 - 35 years 09/98 (9.18%) and 16 - 20 years 03/98 (3.06%). While the age group 36 - 40 years had the lowest incidence of infection 02/98 (2.06%).

The prevalence of infection in relation to gestational age is shown in [Table 3], higher rate of infection in third trimester (26 - 40 weeks) of 72/98 (73.46%) compared to second trimester (13 - 25 weeks) of 19/98 (19.38%) and first trimester (1 - 12 weeks) of 7/98 (7.14%).

The prevalence of infection in relation to gravidity is shown in [Table 4]. The highest incidence is seen in primigravida 57/98 (58.16%) and lowest incidence in is seen in primigravida 9/98 (9.18%).

The gold standard for detecting bacteruria in pregnancy is urine culture. Table 5 showed the frequency of various isolated pathogens. 252 samples had no growth, 98 samples were positive for urinary pathognons. Among the significant isolates E. coli had the highest percentage of isolation 56/98 (57.14%), while the lowest was proteus species of 4/98 (4.08%).
DISCUSSION
Urinary tract infections are one of the common infections occurring during pregnancy. The intent of present study is to determine the prevalence of urinary tract infection in pregnancy. A total of 350 pregnant women were included in the study. In this study out of 350 pregnant cases, 98 patients showed significant bacterial growth making an overall prevalence of 28%.

Maternal age was not found to be a significant risk factor in this study. In literature, only a significant increasing risk of 1% - 2% is reported per decade of age,\(^{(2,4)}\) which does not become evident in this study. The highest incidence is 21 - 25 years followed by 26 - 30 years and 31 - 35 years. The reason could be due to the fact that many women within this age group are likely to have had many children before the present pregnancy and it has been reported that multiparity is a risk factor for acquiring bacteriuria in pregnancy.\(^{(12,18)}\) Sexual activity and certain contraceptive methods are also said to increase the risk,\(^{(19)}\) and women are mostly sexually active at this age. The report of this study is also similar to that of Onuh et al,\(^{(20)}\) who also found the similar age group has highest incidence in developing urinary tract infection in pregnancy.

Multiparity has an increased risk factor of developing bacteriuria among pregnant women. Leigh\(^{(20)}\) and Sharma JB et al\(^{(22)}\) had similar observation regarding the risk of urinary incontinence and other urinary problem, which according to them increases by 37.04% with parity of > 3 as compared to 18.75% in nulliparous, but disagreement was evident with the findings of Onuh et al\(^{(21)}\) who reported that there was no relationship to parity.

In this study ninety eight (98) urine samples gave significant growth amounting to 28% prevalence, which is nearly similar to Onuh and colleagues\(^{(21)}\) who reported prevalence of 32.7%. This study does not agree with that of Akinloye et al\(^{(23)}\) who reported 21.7%, a bit lower to the present study. Furthermore, the prevalence of this study does not agree with that of Onyemeluoke et al\(^{(24)}\) who reported a prevalence of 12.7% and also with Leigh\(^{(20)}\) and Brook et al\(^{(25)}\) who reported a prevalence of 1% - 10%. This difference may be due to the inclusion of both symptomatic and asymptomatic pregnant woman in this study or as a result of different socioeconomic status of the pregnant women.

In this study, the frequency of urinary tract infection was higher in the third trimester compared to the first and second trimester. This is in agreement with Leigh,\(^{(20)}\) who reported an increased frequency of urinary tract infection in third trimester compared to the first and second trimester of pregnancy. However, this report does not agree with Onuh et al,\(^{(21)}\) who reported a higher prevalence of urinary tract infection in the second trimester compared to the third trimester. This difference may be as a result of either change in urinary stasis and vesicoureteral reflux or decrease in urinary progesterones and oestrogens in the various trimesters of pregnancy.

CONCLUSION
In this study, the prevalence rate of urinary tract infection during pregnancy is 28%. The physiological changes of pregnancy predispose women to UTI, so does other factors such as age, sexual activity, multiparity, previous history of UTI and socio-economic conditions. All pregnant women should be screened for UTI with a urine culture, treated with antibiotics and if the culture is positive and then retested for cure. The goal of early diagnosis and treatment of UTI during pregnancy is to prevent complications with all the added benefits to the mother and foetus.

REFERENCES

<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Number Isolated</th>
<th>Positive %</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>56</td>
<td>57.14%</td>
</tr>
<tr>
<td>Enterococcus</td>
<td>24</td>
<td>24.48%</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>8</td>
<td>8.16%</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>6</td>
<td>6.12%</td>
</tr>
<tr>
<td>Proteus</td>
<td>4</td>
<td>4.08%</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 5. Percentage of Isolation of various Significant Pathogens in Urine of Pregnant Women.


