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Original Research

Study On Urinary Tract Infections Among Preganant Women Attending Out Teritiary Care Centre

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ABSTRACT

Aim and Objectives: to find out the prevalence of urinary tract infection among pregnant women and to study the frequency of type of pathogens isolated in urine among the pregnant women.

Materials and Methods: Consecutive sampling was done to select pregnant women from the antenatal clinic. Willing pregnant women were screened for the eligibility and then informed about the purpose of the study and provided with an information sheet in the local language. An informed written consent was obtained thereafter. A semi-structured, pretested interview schedule having sociodemographic details, obstetric history, medical history, and symptoms of UTI was administered to the selected pregnant women. A midstream urine sample was collected from the selected pregnant women in sterile wide mouth bottle, up to three-fourth of its capacity. All the urine samples were plated onto the MacConkey agar within 2 h of collection using standard methods in the laboratory of our hospital. The plates were then kept in incubator at 37°C. Two checks for culture growth were done at 24 h and 48 h. On identification of growth, colony count was done using standard methods. The plates which did not show any growth even after 48 h of incubation were discarded.

Discussion and Conclusion: In the present study, we found the prevalence of 5.33% in pregnant women attending our tertiary care hospital. Out of 36, asymptomatic bacteria were seen in 16 (2.66%), symptomatic bacteriuria in 20 (3.33%) and overall symptoms of UTI seen in 172 (26.6%) pregnant women. It is also evident in the present study that E. coli as the main cause of UTIs in pregnant women of this city (72.2%), Klebsiella as the second cause of UTI (16.6%) and Proteus accounted for 11.1% of the cases.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 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 the Fetus.

Keywords: pregnancy, urinary tract infections, prevalence, asymptomatic bacteriuria, and symptomatic bacteriuria.

INTRODUCTION:

Urinary tract infections (UTIs) are bacterial infections with a global annual incidence of approximately 150 million cases. UTIs are one of the most common medical complications of pregnancy. Increased incidence of UTI during pregnancy is due to the morphological and the physiological changes that take place in the genitourinary tract during pregnancy [1-5].

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Pregnancy causes numerous hormonal and mechanical changes in the body. Beginning in the 6^{th} week, with peak incidence during 22^{nd}-24^{th} weeks of gestation, 90% of the pregnant women develop ureteric dilatation thereby increasing the risk of urinary stasis and vesicoureteric reflux. In addition, glycosuria and aminoaciduria during pregnancy provide an excellent culture medium for bacteria in areas of urinary stasis. These changes along with already short urethra and difficulty with hygiene due to the distended pregnant belly increase the frequency of UTI in pregnant women [7-10].
UTI may present in pregnancy either as asymptomatic bacteriuria or as symptomatic infection. The prevalence of asymptomatic bacteriuria has been estimated to range from 2% to 10% in various studies globally. The prevalence of UTI in pregnant women in India is reported to range from 3% to 24%. Pregnant women with UTI are more likely to develop hypertensive diseases of pregnancy, anemia, chronic renal failure, prematurity, and low birth weight babies. The upper UTIs in particular may lead to significant morbidity for both the mother and the fetus.

An early detection and treatment of asymptomatic bacteriuria is of considerable importance not only to forestall acute pyelonephritis and chronic renal failure in the mother but also to reduce prematurity and foetal mortality in the offspring. Hence, this study taken up to find out the prevalence of UTI and asymptomatic bacteriuria among pregnant women in secondary care setting in rural Haryana, India

AIM AND OBJECTIVES:

1) To find out the prevalence of urinary tract infection among pregnant women.
2) To study the frequency of type of pathogens isolated in urine among the pregnant women.

MATERIALS AND METHODS:

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology, at Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, WB
We enrolled a total of 300 eligible pregnant women coming for their first antenatal checkup (ANC).

Study design: Prospective hospital based study.

Sample size: 600 cases of antenatal mothers were included.

Inclusion Criteria: Apparently healthy pregnant women, both primigravida and multi-gravida, with singleton pregnancies were included and written informed consent were obtained from the enrolled cases.
Exclusion Criteria: Seriously ill pregnant women, patients with previously diagnosed chronic/congenital diseases of kidney and or urinary tract, and patients with previously diagnosed UTI as confirmed microbiologically were excluded from the study.

Data collection: Consecutive sampling was done to select pregnant women from the antenatal clinic. Willing pregnant women were screened for the eligibility and then informed about the purpose of the study and provided with an information sheet in the local language. An informed written consent was obtained thereafter. A semi-structured, pretested interview schedule having sociodemographic details, obstetric history, medical history, and symptoms of UTI was administered to the selected pregnant women.

Blood Sample Collection and Biochemical Investigations: A midstream urine sample was collected from the selected pregnant women in sterile wide mouth bottle, up to three-fourth of its

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capacity. All the urine samples were plated onto the MacConkey agar within 2 h of collection using standard methods in the laboratory of our hospital. The laboratory was manned with two laboratory technicians and two laboratory assistants. The plates were then kept in incubator at 37°C. Two checks for culture growth were done at 24 h and 48 h. On identification of growth, colony count was done using standard methods. The plates which did not show any growth even after 48 h of incubation were discarded.

Symptoms of urinary tract infection: A pregnant woman was said to have symptoms of UTI when she had one or more of any of the following symptoms on the basis of history: increased frequency of micturition, burning micturition, and painful micturition.

Asymptomatic bacteriuria: A woman was said to have asymptomatic bacteriuria when none of the symptoms of UTI was present, and the colony count in a single culture was 10^5 or more.

Symptomatic bacteriuria: A woman was said to have symptomatic bacteriuria when any symptom of UTI was present, and the colony count in a single culture was 10^3 or more.

Urinary tract infection: A woman was said to have UTI when either of asymptomatic bacteriuria or symptomatic bacteriuria was present.
Statistical analysis was done in Statistical Package for Social Sciences 2021 and the results of descriptive analysis were presented as proportions or as mean wherever applicable, and of bivariate analysis as odds ratio with P value.

This cross-sectional study was conducted in the Department of Biochemistry, in collaboration with the Department of Obstetrics and Gynecology, and 382 eligible pregnant women coming for their first antenatal checkup (ANC) were enrolled in the study.

Apparently healthy pregnant women, both primigravida and multi-gravida, with singleton pregnancies in their first ANC were included and written informed consent was obtained from the enrolled cases. Pregnant women with preexisting thyroid diseases or any other endocrine disorders, pre-existing diabetes, on any hormone replacement therapy, any other metabolic or chronic disorders, and bad obstetric history with a known cause were excluded from the study.

After general and gynecological examination, fasting, one-hour, and two-hour blood samples were collected for 75 g OGTT and estimation of thyroid profile (TSH, fT4, anti-TPO antibody). The biochemical parameters were performed on the Beckman Coulter AU5A00 auto analyzer with commercially available kits. Thyroid profiles were done by the chemiluminescence method in an Siemens Advia Centaur automated Immunoassay analyzer.

For this study, the trimester-specific upper limit value for TSH was taken as <2.5 mIU/mL for the first trimester and <3 mIU/mL for the second and third trimesters as per American Thyroid Association (ATA) 2011 criteria. Patients with TSH levels higher than the trimester specific level and normal fT4 levels were diagnosed with SCH. Anti-TPO level <60 U/L was taken as normal upper limit as per manufacturer's protocol.
Level more than 60U/L is considered a raised anti-TPO titer.
GDM was diagnosed using 75 g of glucose challenge test (GCT) with a fasting value of more than 92 mg/dl, a one-hour post-glucose value of more than 180 mg/dl, and a two-hour post-glucose value of more than 153 mg/d

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RESULTS:

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology at our hospital. A total of 600 eligible pregnant women coming for their first antenatal checkup (ANC) were enrolled in the study.

Table 1: Shows baseline characteristics of the study patients

Parameters	Mean ± SD
Age	25.43 ± 3.24
Gestational age	9.2 ± 2.72

Table 2: Shows the prevalence of UTI among pregnant women

	Number	Prevalence
UTI overall	36	5.33
Asymptomatic bacteriuria	16	2.66
Symptomatic bacteriuria	20	3.33
Symptoms of UTI	172	26.6
UTI among women presenting with symptoms	20	3.33
UTI among women with no symptoms of UTI	20	2.66

Table 3: Shows the percentage of isolation of various significant pathogens in urine of pregnant women

	Number	Prevalence
Ecoli	26	72.2
Klebsiella spp	6	16.6
Proteus spp	4	11.1
Total	36	100

DISCUSSION:

In the present study, we included 600 antenatal women based on inclusion and exclusion criteria. We measured thyroid function tests to calculate and study the prevalence of urinary tract infection among pregnant women. We found the prevalence of 5.33% in pregnant women attending our tertiary care hospital. Out of 36, asymptomatic bacteria were seen in 16 (2.66%), symptomatic bacteriuria in 20 (3.33%) and overall symptoms of UTI seen in 172 (26.6%) pregnant women. Various studies conducted in the past by Akinloye et al [11], Onuh and colleagues [12], Onyemelukwe et al [13], Leigh [14] have reported the prevalence raging from 10 to 30% and our study results agrees with the study conducted by Brook et al [15] 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 because of difference socioeconomic status of the pregnant women.

Pregnancy increases the risk of UTI. At around 6th week of pregnancy, due to the physiological changes of pregnancy the ureters begin to dilate. This is also known as "hydronephrosis of pregnancy", which peaks at 22-26 weeks and continues to persist until delivery. Both progesterone and estrogens levels increase during pregnancy and these will lead to decreased ureteral and bladder tone. Increased plasma volume during pregnancy leads to decrease urine concentration and increased bladder volume. The combination of all these factors lead to urinary stasis and uretero-vesical reflux. Additionally, the apparent reduction in immunity of pregnant women appears to encourage the growth of both commensal and non-commensal microorganisms. The physiological increase in plasma volume during pregnancy decreases urine concentration and up to 70% pregnant women develop glucosuria, which encourages bacterial growth in the urine. Female gender itself is

a risk factor because of short urethra, its proximity to vagina and anus and inability of women to empty their bladder completely. High incidence is seen in lower socioeconomic group. Sexual activity and certain contraceptive methods are also said to increase the risk. The anatomical relationship of female's urethra and the vagina makes it liable to trauma during sexual intercourse as well as bacteria been massaged up the urethra into the bladder during pregnancy/child birth. Abnormalities of urinary tract or stones, diabetes mellitus, immunosuppression and past-history of UTI tend to increase the risk.

Urinary tract infection during pregnancy contributes significantly to maternal and perinatal morbidity. Abortion, small birth size, maternal anemia, hypertension, preterm labour, phlebitis, thrombosis and chronic pyelonephritis are related to urinary tract infection during pregnancy [15-22].
It is evident in the present study that E. coli as the main cause of UTIs in pregnant women of this city (72.2%), Klebsiella as the second cause of UTI (16.6%) and Proteus accounted for 11.1% of the cases. In a study conducted by Amiri et al. E. coli was indicated to be the cause of 83% of UTIs in pregnant women and staphylococcus saprophyticus (10%), enterococcus (4%) and proteus (3%) were other causes of UTIs [23]. Also, the results from the studies of Mobbasheri et al. in Gorgan mark that E.coli 33.3 % coagulase negative staph 30.3% and klebsiella 15.2% are the major causes of UTIs among pregnant women [24].

CONCLUSION:

In the present study, we found the prevalence of 5.33% in pregnant women attending our tertiary care hospital. Out of 36, asymptomatic bacteria were seen in 16 (2.66%), symptomatic bacteriuria in 20 (3.33%) and overall symptoms of UTI seen in 172 (26.6%) pregnant women. It is also evident in the present study that E. coli as the main cause of UTIs in pregnant women of this city (72.2%), Klebsiella as the second cause of UTI (16.6%) and Proteus accounted for 11.1% of the cases. 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 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 the Fetus.

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