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URINARY TRACT INFECTIONS IN PREGNANCY AT A TERTIARY CARE HOSPITAL.

Obstetrics & Gynaecology

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ABSTRACT

Introduction: 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. An early detection and treatment of asymptomatic bacteriuria may be of considerable importance not only to forestall acute pyelonephritis and chronic renal failure in the mother but also to reduce prematurity and fetal mortality in the offspring. **Objective:** To estimate burden of UTI in pregnancy. **Materials and methods:** This study was conducted in the Alluri Sitarama Raju Academy of Medical Sciences, Eluru. All pregnant women attending antenatal clinic and willing to participate and able to give valid consent were included in the study. A midstream urine sample was collected from selected pregnant women in sterile wide mouth bottle, up to three-fourth of its capacity samples were plated onto MacConkey agar and incubated at 37°C and colony count was done using standard methods. **Results:** A total of 125 pregnant women were enrolled in the study. Mean age of pregnant women was 23.6 (3.4) years. Majority of pregnant women (59.5%) were in the second trimester of pregnancy. The proportion of women with symptoms of UTI on the basis of history was 33.3% (95% confidence interval [CI] - 30.7, 35.9). The proportion of pregnant women with UTI in the first, second, and third trimester was 1.7, 3.2, and 4.5%, respectively. **Conclusion:** The study suggested that considering the burden of UTI and its complications, diagnosis of UTI can be done after screening women with symptoms suggestive of UTI on the basis of history.

KEYWORDS

India, Pregnant women, Urinary Tract Infection (UTI), Asymptomatic bacteriuria

INTRODUCTION:

Urinary tract infection (UTI) is a common clinical problem, which can involve urethra, bladder, and kidney. Urinary tract infections (UTIs) are bacterial infections with a global annual incidence of approximately 150 million cases.1 About 40% of women and 12% of men experience at least one symptomatic UTI during their lifetime, and as many as 40% of affected women show recurrent UTI.[2-5]

UTIs are one of the most common medical complications of pregnancy. UTI affects all age groups, but women are more susceptible than men, due to short urethra, absence of prostatic secretion, pregnancy and easy contamination of the urinary tract with faecal flora.6 Increased incidence of UTI during pregnancy is due to the morphological and the physiological changes that take place in the genitourinary tract during pregnancy.7,8 Pregnancy causes numerous hormonal and mechanical changes in the body.9,10 Beginning in the 6th week, with peak incidence during 22nd–24th weeks of gestation, 90% of the pregnant women develop ureteric dilatation thereby increasing the risk of urinary stasis and vesicoureteric reflux.11 In addition, glycosuria and aminoaciduria during pregnancy provide an excellent culture medium for bacteria in areas of urinary stasis.10 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. 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.12 The prevalence of UTI (including both asymptomatic bacteriuria and symptomatic infection) in pregnant women in India is reported to range from 3% to 24%.8,13-16Pregnant women with UTI are more likely to develop hypertensive diseases of pregnancy, anemia, chronic renal failure, prematurity, and low birth weight babies.17-19 The upper UTIs in particular may lead to significant morbidity for both the mother and the fetus.[13,20]

An early detection and treatment of asymptomatic bacteriuria may be of considerable importance not only to forestall acute pyelonephritis and chronic renal failure in the mother but also to reduce prematurity and fetal mortality in the offspring.9,18 The United States Preventive Services Task Force recommends screening for asymptomatic bacteriuria with urine culture for pregnant women.21 No regular screening is done for the presence of symptomatic urine infection or asymptomatic bacteriuria during pregnancy in India. The main objective of the study is to estimate burden of UTI in pregnancy.

MATERIALS AND METHODS:

This study was conducted on 125 antenatal women attending OBGY OPD, Alluri Sitarama Raju Academy of Medical Sciences, Eluru. The study period was from October 2019 to January 2020. All pregnant women attending antenatal clinic and willing to participate and able to give valid consent were included in the study. 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. 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 (approximately 10 ml). All the urine samples were plated onto the Mac Conkey agar within 2 h of collection. 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.

RESULTS:

A total of 125 pregnant women were enrolled in the study. Most (77.9%) of the pregnant women were in the age group 18–25 years. Mean (standard deviation) age of pregnant women was 23.6 (3.4) years. Median (interquartile range [IQR]) duration of marriage was 4 (2.0, 6.5) years. Most (91.7%) of the pregnant women were Hindu by religion.

The majority of pregnant women (59.5%) were in the second trimester of pregnancy. Almost one-fourth of pregnant women were in the third trimester of pregnancy. The majority of pregnant women were unemployed/ homemaker by occupation. Almost one-fifth of the pregnant women were illiterate. Almost one-third of the pregnant women were primigravida. As many as 14% of pregnant women were gravida 4 or more. The history of abortion was present in one-fourth of the pregnant women. The proportion of women with symptoms of UTI

on the basis of history was 33.3% (95% confidence interval [CI] - 30.7, 35.9). On urine examination, visible growth was present in 10.6% of the samples. Out of the total, 4.7% samples had colony count of 100. Almost 2% of the pregnant women had colony count of 103, 104, and 105 or more each.

The proportion of pregnant women attending antenatal outpatient department (OPD) who had UTI was 3.3% (95% CI - 2.4, 4.5). Of all the pregnant women having UTI, two-third, i.e., 2.2% (95% CI - 1.6, 3.2) were symptomatic. The proportion of pregnant women with UTI in the first, second, and third trimester was 1.7, 3.2, and 4.5%, respectively. Of all the pregnant women presenting with symptoms, 6.7% (95% CI - 4.7, 9.5) had laboratory confirmed UTI. Similarly, out of the asymptomatic pregnant women, 1.7% (95% CI - 1.0, 2.8) had laboratory-confirmed UTI [Table 1].

Table 1: Occurrence of urinary tract infection (n=125)

	N	Prevalence (95% CI)
UTI overall	42	3.3 (2.4-4.5)
Asymptomatic bacteriuria	14	1.1 (0.7-1.9)
Symptomatic bacteriuria	28	2.2 (1.6-3.2)
Symptoms of UTI (frequency, burning, and dysuria)	42	33.3 (30.7-35.9)
UTI among women presenting with symptoms	3/42	6.7 (4.7-9.5)
UTI among women with no symptoms of UTI	2/83	1.7 (1.0-2.8)
UTI in first trimester pregnant women	3/18	1.7 (0.6-5.0)
UTI in second trimester pregnant women	3/75	3.2 (2.2-4.7)
UTI in third trimester pregnant women	2/32	4.5(2.7-7.3)

The presence of UTI was found to be significantly associated with presence of symptom of increased frequency of micturition, burning micturition and the presence of any one symptom of UTI. Rest of the variables studied (i.e., age of pregnant women, occupation of pregnant women, education of pregnant women, gravida of pregnant women, history of abortion, and painful micturition) were not found to be significantly associated with the presence of UTI. In multivariate analysis, laboratory-confirmed UTI was found to be significantly associated with the presence of any symptom of UTI. Other variables included in the analysis were statistically not significantly associated [Table 2].

Table 2: Distribution of UTI in pregnant women by various variables and symptoms

CATEGORY	NO OF PARTICIPANTS (n=125)	UTI PRESENT (n=4)
AGE GROUP 18-25 >25	98 28	3 1
Occupation of participants • Shop owner, clerical or farmer, and above • Skilled, semi-skilled, unskilled worker,and unemployed or homemaker	4 121	0 4
Education of participants • Intermediate/diploma, and above • Less than intermediate/diploma	36 89	1 3
Socioeconomic status of the family • Upper, upper middle • Lower middle, upper lower, and lower	18 107	1 3
Gravida of the pregnant women • Primigravida • Multigravida	45 80	1 3
History of abortion • Present • Absent	32 93	1 3
Increased frequency of micturition • Absent • Present	89 36	2 2
Painful micturition • Absent • Present	117 8	3 1
Burning micturition • Absent • Present	113 12	3 1
Any symptom of UTI • Absent • Present	84 41	1 3

DISCUSSION:

Since UTI is frequently associated with complications, it is necessary to have an estimate of its burden in pregnant women. The proportion of women with UTI in our study was 3.3% including both asymptomatic bacteriuria and symptomatic bacteriuria. This is comparable with the studies done previously in North India by Sujatha and Nawani and Chandel et al.22,23 Previous studies from South India by Jayalakshmi and Jayaram and Lavanya and Jogalakshmi have also reported similar estimates.8,15 This finding is comparable to the estimates reported by few studies done outside India as well.24,25 Bandyopadhyay et al. and Sabharwal have reported higher proportion of women (25.2% and 24%, respectively) having UTI ascompared to this study.

UTI is frequently associated with both maternal and neonatal complications. Hence, there should be some provision to screen the antenatal women for the presence of UTI.21This will help in reducing the morbidity associated with undiagnosed and missed cases of UTI. In this study, one out of every three women attending antenatal OPD had complaints suggestive of UTI. Out of the symptomatic women, 6.7% had microbiologically confirmed UTI as compared to the asymptomatic women, in whom only 1.7% had confirmed UTI. Hence, the chance of having UTI among those who are symptomatic is almost 4 times to that of asymptomatic women. This information can be used for confirmation of UTI in a setting where resources are limited.

Routine screening of all the pregnant women irrespective of symptoms can be done for laboratory diagnosis of UTI. Thus, if we screen the antenatal women by symptoms of UTI, then we can diagnose UTI with only one-third burden on the health system. In this study, the proportion of pregnant women with UTI was maximum in the third trimester. This has also been shown in other studies in the past.26,27 Hence, if only 1 time screening is affordable, then it should preferably be done in the third trimester. Treatment solely on the basis of symptoms could lead to overtreatment (93% of women with symptoms in this study did not have UTI). Overtreatment may unnecessarily expose a pregnant woman and her fetus to the antibiotics and also contribute to the development of antibiotic resistance.28Hence, initial screening of pregnant women for symptoms, followed by urine culture among symptomatics can be an alternate strategy for diagnosis of UTI. However, the proposed test strategy would result in women with asymptomatic UTI being missed out.

CONCLUSION:

The study suggested that considering the burden of UTI and its complications, diagnosis of UTI can be done after screening women with symptoms suggestive of UTI on the basis of history.

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