Original Article

UTI in Pregnant Women

Frequency of Urinary Tract Infection in Pregnant Women Based on Urine Routine Examination and Culture and Sensitivity in a Tertiary Care Centre in Rawalpindi

Touseef Fatima, Faiza Ibrar and Nosheen Akhtar

ABSTRACT

Objective: Urinary pregnancy is commonly affected by urinary tract infection and Escherichia coli is the most common causative organism. Asymptomatic bacteriuria can lead to cystitis or pyelonephritis. 10% of the women visiting outdoor clinics have UTI and 15% of women can have a UTI at any time during their life. Purpose of this study was to find out the frequency of urinary tract infection in pregnant women in our setting.

Study Design: Observational study.

Place and duration of Study: This study was conducted at the Gynecology outpatient Department Fauji Foundation Hospital, Rawalpindi. Study data was collected over six months from 8th May till 7th November 2009.

Materials and Methods: 117 patients with symptoms of UTI were included on the study. Patients were selected through non probability consecutive sampling from outpatient clinics of department of Obstetrics and Gynecology, Fauji Foundation Hospital Rawalpindi.

Results: The mean age of the affected patients was 31.46 ± 6.5 years. The mean gestational age was 167.56 ± 65.84 days. The mean gravidity was 4.43 ± 2.80. The mean parity was 3.05 ± 2.30. UTI diagnosed by urine analysis and culture and sensitivity was 20.5%. Frequency of UTI in 1st, 2nd and third trimester was 29.1%, 33.3% and 37.5% respectively. Escherichia Coli was isolated in 58.3%, Pseudomonas in 16.6%, Klebsiella in 8.3%, Staphylococcus aureus in 8.3% and Proteus spp. in 8.3%.

Conclusion: Urinary tract infection when diagnosed using urine analysis and culture & sensitivity is a frequent finding among pregnant women.

Keywords: Urinary tract infection, pregnancy, urine routine examination, microscopy, culture and sensitivity.

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INTRODUCTION

Although urinary tract infection is a common problem[1], most commonly urethra and urinary bladder are involved but upper urinary tract i.e. ureter and kidney can also be involved. It can affect any age group of both genders but susceptibility of women to UTI is more due to short urethra. This susceptibility is even increased during pregnancy due to various physiological changes in urinary tract. The development of glycosuria in pregnancy favors bacterial growth during pregnancy and urinary tract system dilatation favors upward spread of infection if not treated in time.

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The estimated prevalence of asymptomatic bacteriuria (ASB) in pregnant women is 2.5-11% [2] which is higher than non pregnant women i.e. 3-8% .however frequency of overt clinical infection is similar in both groups i.e. 0.3-1.3 %. ASB is a risk factor for acute cystitis (40%) and pyelonephritis (25-30%) in pregnancy if left untreated. It causes 70% of all cases of UTI.

The symptoms of urinary tract infection are pain during micturation or a burning micturition, urgency and frequency. A number of risk factors may be involved like increased age, low socioeconomic status, sexual activity, multi parity [3] and untreated pathologies. Changes in coital patterns (e.g. changes in position, frequency, and post coital antibiotics can offset recurrence in at risk individuals). Pregnant women with UTI are at risk of pre term delivery, spontaneous miscarriage and other adverse pregnancy outcomes. Very Rarely septicemia, septic shock and death are caused by it.

Presence of white and red blood cells and bacteria on urine analysis and detection of bacterial growth on culture is a reliable diagnostic test for UTIs. This study has been designed to analyze frequency of UTI in pregnant women.

MATERIALS AND METHODS

This study was conducted at the Gynecology outpatient Department Fauji Foundation Hospital, Rawalpindi. Study data was collected over six months from 8th May till 7th November 2009.117 patients with symptoms of UTI were included on the study. Patients were selected through non probability consecutive sampling from outpatient clinics of department of Obstetrics and Gynecology, Fauji Foundation Hospital Rawalpindi.

All the women with confirmed pregnancy irrespective of their duration of pregnancy, of all age groups and parity with complaints of burning and frequency of micturition attending Gynecology outpatient Department Fauji Foundation Hospital Rawalpindi were included. Pregnant women having renal pathology, with any organic disease of genital tract, who have taken antibiotic in last seven days and non pregnant women were excluded.

It is descriptive cross sectional study. Data was collected through a proforma containing all relevant details of 117 women fulfilling the inclusion criteria. Permission was taken from hospital ethical committee. Married pregnant women with confirmed pregnancy on ultrasound, of any age and parity, coming to Gynecology out patient Department with complaints of burning and frequency of micturition were asked to take part in study. Detailed obstetrical, gynecological and medical history was taken. After well informed consent patients were asked to give midstream specimen after periurethral toilet, which was sent to laboratory within half an hour where urinalysis and culture and sensitivity was done by single pathologist.

The data was analyzed by using SPSS version 10 Mean = standard deviation was calculated for numerical data e.g. gravidity, parity, urinalysis, microscopic findings, culture and sensitivity. Frequencies (%) were calculated for categorical data.

RESULTS

Our study included 117 pregnant women with symptoms of UTI. The patient's age ranged from 18-45 years. The mean age of the patients presented was 31.46±6.5 years. Gravidity ranged from 1-11 with a mean of 4.43±2.80. The parity ranged from 0-8 with a mean of 3.O5±2.30. The gestational age ranged from 60 to 280 days with a mean of 167.56±65.84 days. Urinary tract infections diagnosed on the basis of urine routine space examination and urine culture was present in 24 (20.5%). Pus cells on urinalysis were found in 50(42.7%) patient. Urine culture was positive in 24(20.5%) patients.

Escherichia Coli was isolated in 14(58.3%) patients. Pseudomonas isolated in 4(16.65%) of patients. Klebsiella isolated in 2(8.3%) patients. Staphylococcus saprophyticus isolated in 2(8.3%) patients. Proteus spp isolated in 2 (8.3%) patients.

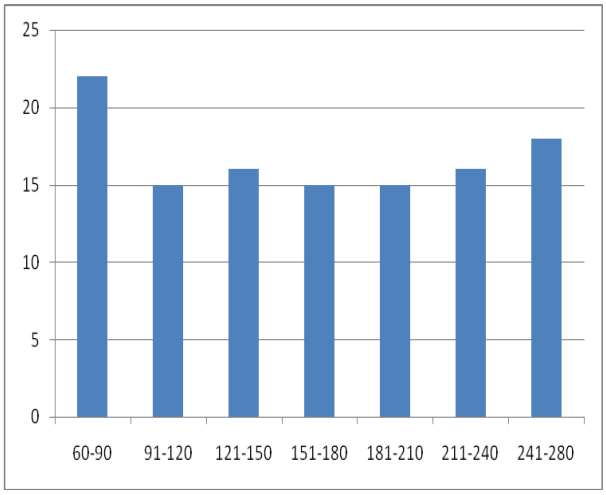

Figure No.1: Histogram showing gestational age of study population

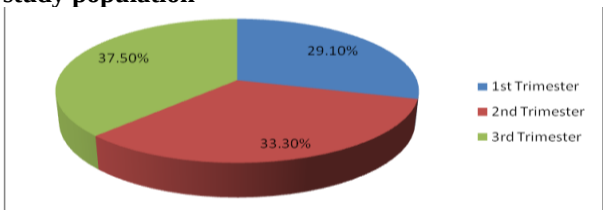

Figure No.2: Pie graph showing frequency of UTI according to trimesters

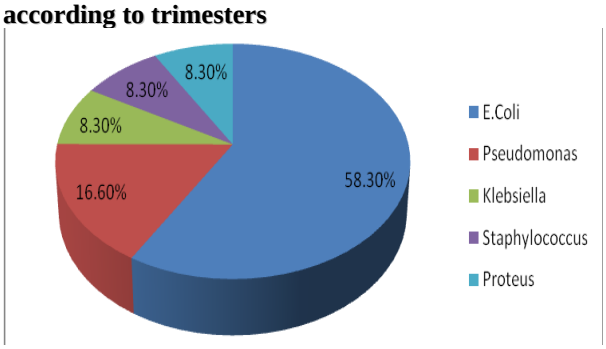

Figure No.3: Pie chart showing frequency of various microorganisms isolated.

DISCUSSION

Pregnancy is a risk factor for UTI. The risk for UTI starts as soon as 6 weeks of pregnancy. The physiological changes of pregnancy are attributed for this increased risk of development of UTI. Ureteral dilatation increased bladder volume and decreased bladder tone, along with decreased ureteral tone, contribute to increased urinary stasis and ureterovesical reflex. Additionally 70% of pregnant women develop glycosuria which encourages bacterial growth in the urine. Moreover increase progestin and estrogens decrease ureteral tone which decreased the resistance of lower urinary tract against bacteria invasion.

It is reported that UTI was developed amongst the 4 to 5 % of pregnant women. Factors affecting symptom variation of UTI are age, gender, previous pathology and whether a catheter is present or not. UTI symptoms

include frequency and urgency of micturition and dysuria among young women. Older women are more likely to be tired, weak and have muscle aches and abdominal pain.

Regarding organisms, 80 to 90 % of infections are caused by Escherichia Coli and this stands true for both pregnant as well as nonpregnant patients. Proteus Mirabilis and Klebsiella Pneumonia are common, whereas group B streptococcus and staphylococcus saprophyticus are less common among Gram positive organisms. Other organisms like Enterococci, Gardenella vaginalis and Ureaplasma urealyticum may also cause UTI though they are rare. Another research suggested that women who are "non-secretors" of certain blood group antigens can have recurrent UTIs. This is proposed because the Epithelium of the vagina and urethra in these women may allow bacteria to attach and invade easily.

In order to diagnose UTI, urinary symptoms should be asked about and then sample of urine should be tested for the presence of bacteria and white blood cells. Body produces white blood cells to fight against infection. For accurate diagnosis clean catch specimen of urine is mandatory. Patient is asked to wash genital area and collect midstream urine sample in a container. Culture is performed by placing part of urine sample in a tube or dish with a medium encouraging bacteria growth. Bacteria identified when they have multiplied usually after 1 to 3 days. A sensitivity test is then performed to different antibiotics to see which medication is best for treating the infection.

Maternal and neonatal complications during pregnancy can be devastating. Asymptomatic bacteriuria if untreated can develop symptomatic cystitis in 30 % of the patients and up to 50 % develop pyelonephritis if not treated. Asymptomatic bacteriuria can cause growth restriction of fetus in utero and delivery of infants with low birth weight. It is recommended to screen all the women for asymptomatic bacteriuria and any symptoms of UTI should be evaluated. Screening and treating give benefit to women having previous history of preterm delivery.

The objective of this current study was to study the prevalence of urinary tract infection among pregnant women in a (tertiary health care centre). In our observational study 117 symptomatic women were screened for urinary tract infection. Urinary tract infection was diagnosed in 24(20.5%) patient on the basis of urine routine examination and urine culture and sensitivity. Out of those patients, pus cells were seen on in urine samples of 50(47.2%) patients. Positive urine culture was found in 24(20.5%) patients.

The age groups of our studied patients were between 18-45 years. Frequency of UTI in different trimesters found were 29.1 % in 1st trimester, 33.3% in 2nd trimester and 37.5% in 3rd trimester. Microorganisms detected were E.coli in 14(58.3%), Pseudomonas in 4(16.6%), Klebsiella in 2(8.3%), Staphylococcus saprophyticus in 2(8.3%) and Proteus spp. in 2(8.3%) patients.

A study was carried out to find out the prevalence of urinary tract infection (UTI) in pregnant women in Khyber Teaching Hospital Peshawar [4] .The prevalence rate of UTI was 29.57% among symptomatic and 23.33% among control. Multipara are significantly affected by UTI however gestational age does not affect its occurrence.. Patients having past history of urological problems are more prone to UTI. The prevalence of different isolated pathogens were Escherichia coli (21.74%) Pseudomonas spp. (12.6%), Klebsiella spp. (1.74%), Proteus spp. (0.87%) Staphylococcus epidermitis (0.87%), Staphylococcus saphrophyticus (0.87%) and Citrobacter spp. (0.87%).

Another study was conducted in Turkey [5] showed prevalence of 18.2%. Among these patients 27.3% were in 1st trimester, 33.8% were in 2nd trimester and 38.9% in 3rd trimester.

Buganda Medical Centre (BMC) in Mwanza, Tanzania[6] carried out a cross sectional study to find out the prevalence among symptomatic and asymptomatic pregnant women. 78 (31.5%) were symptomatic and 169 (68.4%) asymptomatic among total of 247 pregnant women. There is no significant difference between the prevalence of bacteriuria among symptomatic and asymptomatic pregnant women with 17.9% and 13.0% respectively, with no significant difference between the two groups. Escherichia coli (47.2%) and Enterococcus spp (22.2%) were the most common pathogens. The rate of resistance of Escherichia coli to ampicillin, tetracycline, sulfamethoxazole/trimethoprim, gentamicin, ciprofloxacin, nitrofurantoin, ceftriaxone, and imipenem were 53%, 58.8%, 64.7%, 5.9%, 11.8%, 5.9%, 29.4% and 0%, respectively.

In above mentioned studies prevalence found was slightly variable (29%, 18.2%, 14%, 17.9%) as compared to 20.5% in our study. This difference may be because they conducted comparative study between symptomatic and non symptomatic, but our study included only symptomatic pregnant women. Frequency differences relative to trimesters found are nearly same as in our study.

In another cross sectional study conducted in Bahawal Victoria Hospital, Bahawalpur [7] , the prevalence of bacteriuria was 4.8%. In 8.6% of cases causative organism was E coli while 21.4% cases were due to other organisms. Positive past history of UTI was present in 35.7% of these women as compared to only 9.7% non-bacteriuric women. Bacteriuria lead to preterm labour in 21.4% bacteriuric women compared with 4.9% non-bacteriuric women. Bacteriuria was also found to be risk factor for symptomatic UTI as 14.2% bacteriuric and 2.7% non-bacteriuric women developed cystitis. Pregnancy is commonly affected by

asymptomatic bacteriuria which also increases the risk of symptomatic UTI and preterm birth.

Another descriptive study was conducted in the Obstetrics and Gynecology Department of Isra University Hospital, Hyderabad [8] . This study showed that out of 232 women, pregnancy induced changes on urinary system were found to cause urinary symptoms in 108(46.5%) as no growth was found on urine culture whereas 10 (4.3%) were due to underlying UTI. Abnormal voiding pattern was the most common presenting complaint accounting for 40 % of cases followed by irritative symptoms and voiding difficulties. The risk factors for UTI identified were illiteracy, history of sexual activity, low socioeconomic group, past history of UTI and multiparity. Out of 108 cultures, growth was found in only 10 (4.3%) specimens. The most common organism was E-coli 7 (3%) followed by S-aureus in 3 (1.3%).

Another study[4] conducted in Karachi compared prevalence of asymptomatic bacteriuria among pregnant and non pregnant women. Prevalence of asymptomatic bacteriuria among pregnant was 6.2% compared to 2.85 % among non pregnant patients. Regarding pathogens, the finding was similar to other studies with E coli being most common organism followed by Staph. saprophyticus.

The most important similarity found in all studies whichever the study design was or whatever the results were was maximum isolation of Escherichia Coli from urine samples. Urinary tract infections (UTI) are the most common bacterial infections during pregnancy. Untreated UTI can be associated with serious obstetric complications. ASB is a risk factor for recurrent UTI in pregnancy hence all pregnant women should be screened for ASB by culture.

In a study conducted in Nigeria[9] the prevalence of UTI among pregnant patient was found to be 48 %. Individuals of the age group 21-25 years had the highest incidence of infection (41.7%) was found in the age group 21-25 years, while the age group 36-40 years had the lowest incidence of infection (2.0/%). The rate of infection was highest in third trimester 82.3% compared to 17.7 % in the second trimester. Parity was found to have no significant impact on frequency of UTI. The most common pathogen was, staphylococcus aureus 44.8% while the least common was P. mirabilis (0.9 %).

From the above discussion it is clear that exact frequency of UTI is not known. Its frequency varies according to population studied and method chosen for diagnosis. The frequency of UTI ranges between 14-48% in international studies and 4.3-29% in local data. So frequency of UTI of 20.5% is consistent with local and international data. In our study patient diagnosed with UTI were treated according to their symptomatology and sensitivity report and this showed better relief but as this was not the objective of my study so no follow up was maintained of such patient. In future studies are needed to look for adverse pregnancy out- come and efficacy of treatment given to diagnosed cases of UTI in our set- up.

CONCLUSION

Urinary tract infection is frequently diagnosed among pregnant women visiting gyne OPD. Proper diagnosis investigation and treatment is necessary to cure the disease.

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Author's Contribution:

Concept & Design of Study:	Touseef Fatima
Drafting:	Touseef Fatima
Data Analysis:	Faiza Ibrar
Revisiting Critically:	Nosheen Akhtar
Final Approval of version:	Touseef Fatima

Conflict of Interest: The study has no conflict of interest to declare by any author.

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