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Original Article

FREQUENCY OF URINE CULTURE POSITIVITY IN PREGNANT WOMEN WITH URINARY SYMPTOMS AND POSITIVE URINE DETAIL REPORT

** Seema Ghani, ** Saadiya Aziz Karim, *** Rubina Izhar*

* Senior Registrar, Hamdard University Hospital Karachi, Department of Obstetrics & Gynaecology (MBBS, FCPS). (Previously was in Abbasi Shaheed Hospital Karachi.) ** Professor & Head of Department, Jinnah Medical & Dental College Karachi, Department of Obstetrics & Gynaecology (MBBS, FCPS, FRCOG). (Previously head of department in Abbasi Shaheed Hospital/KMDC, Karachi.) *** Professor & Incharge Unit II, Abbasi Shaheed Hospital Karachi/KMDC, Department of Obstetrics & Gynaecology (MBBS, FCPS, FRCOG).

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Correspondence Author:
DR. SEEMA GHANI
Senior Registrar,
Hamdard University Hospital/
Taj Medical Complex, Karachi.
Email: seemaghani@yahoo.com.
Cell: 0300-2180751

ABSTRACT

Objective: To determine the frequency of urine culture positivity in pregnant women with urinary symptoms and positive urine detail report. **Material and Method:** It was a cross sectional study conducted in department of Obstetrics and Gynaecology Unit-I, Abbasi Shaheed hospital Karachi, from June 2008 to December 2008. A total of 396 pregnant women attending OPD of Abbasi Shaheed Hospital, with urinary symptoms and urine detail report showed > 5 WBC's count/HPF (high power field) were included in the study. They underwent culture and sensitivity test of urine. The data of each patient, outcome of urine detail report and urine culture were recorded in proforma. **Result:** Out of 396 symptomatic pregnant women with positive urine detail report (WBC's count > 5/HPF), only 72 women showed growth on urine culture. So frequency of urine culture positivity i.e. urinary tract infection in our study was 18.2%. Mean and standard deviation of women age with positive urine culture found to be 25.67 ± 5.10 years and mean gestational age was 26.6 ± 5.53 weeks. Majority of urine culture positive women were in age group 21-25 years (52.7%), most of the women were multiparas (54.2%) and had 21-30 weeks of gestation (44.6%). The most common urinary symptom was frequency (72.7%) followed by dysuria (32.9%) and urgency (14.1%). In our study the most common pathogens identified was E.coli 31 (43.05%) followed by staphylococcus aureus 16 (22.22%), Klebsiella 9 (12.5%), pseudomonas 7(9.72%), Enterobacter spp. 4(5.55%) and proteus 4(5.55%). Only one isolate of Candida (1.38%) was found. **Conclusion:** The present study showed that there is little association of urinary symptoms and positive urine detail report with the frequency of urine culture positivity. Urinary tract symptoms are frequent in pregnant women which could be due to pregnancy related changes in urinary system rather than urinary infection. Urine culture and sensitivity test is the gold standard for diagnosis of urinary tract infection and every symptomatic pregnant woman with positive urine detail report should

have urine culture to avoid unnecessary antibiotic prescription as well as antibiotic resistance.

Key words: Urinary tract infection, Urine detail report (urine D/R), Urine culture and sensitivity test, Urinary symptoms.

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INTRODUCTION

Urinary tract infection (UTI) is a common problem, affecting millions of people each year. However, this seemingly benign condition may have serious consequence, if it occurs during the course of pregnancy[1]. Untreated, it may lead to pyelonephritis, preterm labour, or group B streptococcal infection in the newborn[1].UTIs, including pyelonephritis are among the almost common health problems during pregnancy and occur in 17% to 20% of pregnancies [2]. Urinary tract infection is important because it may involve the urethra, bladder, uterus and kidney [3]. Several changes in the urinary tract predisposes to infection during pregnancy including diminished bladder tone, increased ureteral peristalsis, mainly from the third month of gestation, and dilatation of ureters and renal pelvis, particularly in primiparous women on right side [4]. Additionally the physiological increase in plasma volume during pregnancy decreases urine concentration and up to 70% pregnant women develops glucosurea, which encourages bacterial growth in the urine [5]. UTIs may lead to serious maternal complications such as septic shock, respiratory insufficiency, fluid balance disorder, chronic renal insufficiency and death [2].

It is, therefore, essential to screen for UTI in pregnancy so, that timely treatment could be offered [1]. Antimicrobial resistance is a growing problem and a major threat to public health[6]. The effective management needs the knowledge of various organisms and their antibiotic sensitivity pattern [7].Inappropriate antimicrobial use can lead to inadequate therapy and contribute to further drug resistance[8]. The diagnosis of UTI can only be proven by culturing the urine, an accurate bacteriological diagnosis is the ideal and must be made in all cases of UTIs [9]. In a UK based study 53 samples out of 100 neither showed any abnormality on dipstick nor any growth on urine culture while the rest of samples showed the presence of leucocytes, proteins or blood on urine dipsticks but only 2 had positive culture for bacterial infection[10]. A study by Nazar Hussain[9] revealed that ampicillin and cotrimoxazole should not be used unless supported by laboratory investigation because of high percentage of resistance amongst the common urinary pathogens.

As in clinical practice a tendency has been observed to start antibiotic when leucocytes are seen on routein urinalysis, usually no culture and sensitivity test is performed and a broad spectrum antibiotic is started as a blanket treatment. These antibiotic courses result in drug resistance. Many times in urine culture and sensitivity test such strains are discovered which are resistant to multiple antibiotics. The rationale of this study is that the therapeutic management of UTIs in pregnancy requires proper diagnostic workup, based on positive urine culture report to ensure safety to the fetus, reduce the antibiotic resistance and unnecessary antibiotic prescription. Therefore in the present study the objective is to determine the frequency of urine culture positivity in symptomatic pregnant women with positive urine detailed report for the appropriate diagnosis and management of urinary tract infection during pregnancy.

MATERIAL AND METHOD

It was a cross sectional study conducted in department of Gynaecology and Obstetrics unit-1 Abbasi Shaheed Hospital, Karachi from June 2008 to December 2008. Sampling technique was by non probability purposive technique and sample size was calculated by proportion of positive urine culture = 4.3%, margin of error 2%, with 95% confidence level n=396. All pregnant women irrespective of age, parity and gestation, with WBC'S Count > 5/hpf on urine detail report and the following urinary symptoms such as urinary frequency i.e: urination more than 6 (the average person urinates Six times a day)[11] , dysuria (painful urination)[11] and urgency (is a strong and sudden desire to void that is in appropriate and which, if not relieved, can result in urge incontinence)[11] determined on history were included. Pregnant women with known under lying renal pathology (chronic renal diseases), renal transplants, taking immunosuppressive therapy, diabetic, previous history of UTI and women already on antibiotics were excluded. Informed consent was taken. Women were advised to collect their midstream urine in a sterilized container, after washing the genital region with soap and water. In microscopy 1ml of centrifuged urine (Centrifuged by 2000 rotation per minute) was taken, supernatant was discarded and sediments were used to make wet preparation to see leucocytes ,

erythrocytes, cast, crystals and others. Then urine culture was performed. Urine was taken by means of calibrated wire loop of 0.001ml in diameter and inoculated on CLED media, intubated at 37 C for 18-24 hrs. After 24 hrs, plates were examined by colony count method. Sensitivity and identification of organisms were done according to standard disc diffusion methods. Data was analyzed by calculating frequency and percentage of urine culture positivity with positive urine detail report. Mean and standard deviation was calculated for age, gestation and WBC's count s in SPSS version 10.0

RESULTS

Among 396 symptomatic cases with positive urine D/R only 72 cases showed growth on urine culture. Frequency of urine culture positivity in the study found to be 18.2%. Mean age of women with positive urine culture in this study was 25.67 ± 5.10 years and mean gestational age was 26.6 ± 5.53 weeks. Majority of the women were multiparas.

Table no.1 analyzed the number of WBC's count in positive urine culture. Highest frequency of positive urine culture i.e: 24.2% seen with WBC's count more than 21/hpf. It was followed by 18.3%and 9.8%with

TABLE # 1

Relationship of WBC's count in positive urine culture

Total number of patients with UTI symptom and Positive urine D/R (n) = 396

Number of patients with positive urine culture (n) = 72

Number of Patients with UTI symptom and Positive urine D/R	Number of WBC's count/hpf	Positive urine culture	Percentage
81	6-10	8	9.8
212	11-20	39	18.3
103	>21	25	24.2

FIGURE # 1

Frequency of Positive urine culture in different age group n= 72

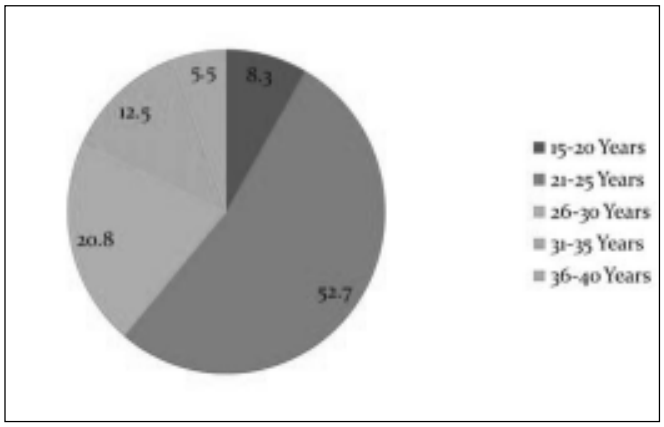


FIGURE # 2

Frequency of Positive urine culture in relation to parity of patient n=72

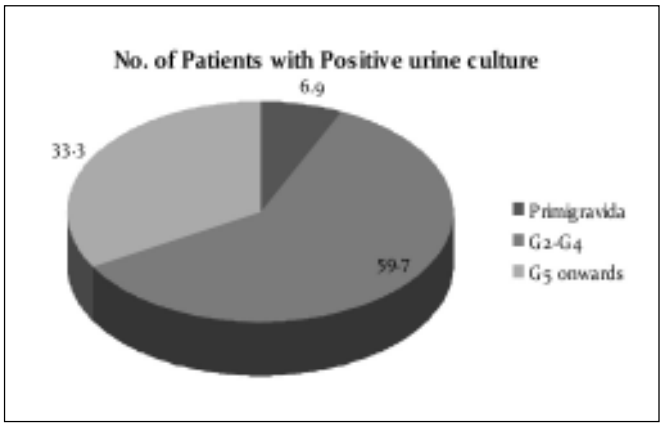


FIGURE # 3
Frequency of Positive culture in relation to gestational age (in weeks) n = 72

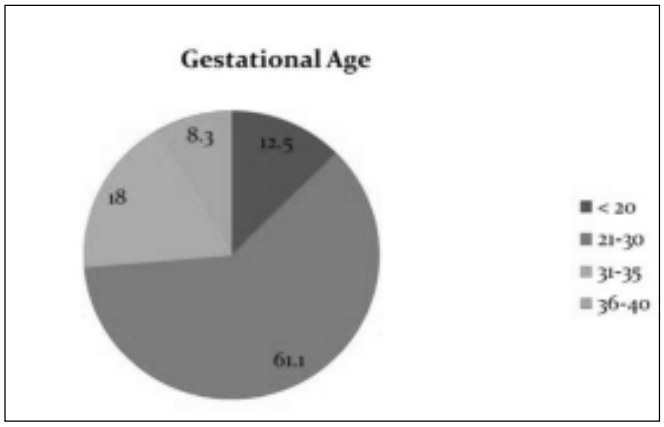
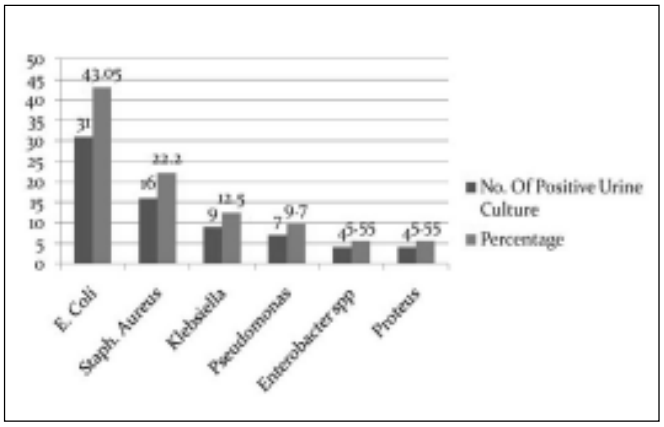


FIGURE # 4
Frequency of organisms detected in urine culture



WBC's count in the range of 11-20/hpf and 6-10/hpf respectively. The overall Mean ± Standard deviation (SD) of WBC's count is equal to 17.35 ± 6.77. Mean ± SD is equal to 19.10 ± 6.63 in patients with positive urine culture.

Figure no. 1 shows frequency of positive urine culture in different age group. Highest frequency of urine culture positivity 52.7% found in the age group of 21-25 years followed by 20.8% in the age group of 26-30 years. Detail of frequency for positive urine culture shown in the table. Mean ± SD of patient's age of positive urine culture is equal to 25.67 ± 5.10.

Figure no.2 shows frequency of positive culture according to parity. Highest frequency (59.7%) found in women of parity between G2-G4 (2nd to 4th gravida), followed by 33.3% in women of G5 (5th gravid) onward. In primigravida frequency found to be only 6.9%.

Figure no.3 shows frequency of positive culture in relation to gestational age. Highest frequency 61.1% found in women of 21-30 weeks gestation, 18.0% found in women of 31-35 weeks, 12.5% found in women of 20 weeks and 8.3% in women of 36-40 weeks gestation. Mean ± SD of patient's gestational age with positive urine culture is equal to 26.6 ± 5.53.

Figure no.4 shows the most common pathogens identified in the study were E.coli 31 (43.05%) followed by staphylococcus aureus 16 (22.22%), Klebsiella 9 (12.5%), pseudomonas 7(9.72%), Enterobacter spp. 4(5.55%) and proteus 4(5.55%). Only one isolate of Candida (1.38%) was found.

DISCUSSION

Out of 396 symptomatic cases only 72 cases showed growth on urine culture. So, frequency of positivity of urine culture i.e. UTI in symptomatic pregnant women with positive urine D/R was found to be 18.2%, while rest 81.8% didn't show any growth on urine culture. They could be symptomatic due to pregnancy related changes but not due to UTI. The frequency of UTI was 14%, 10.4% and 17.9% was reported in the study conducted in Bahawalpur[12] , Ethiopia[13] and Tanzania[14] respectively. According to one study[15] in pregnant women the incidence can be as low as 4.3%. While in other studies, reported prevalence of UTI was 26.8% in Nigeria[16], 30% in Yemen[17] and 51.2% in study conducted in India[18]. These differences in the frequency of UTI could be due to different racial factors and different selection criteria employed. As in the present study, only symptomatic patient with positive urine D/R (WBCs >5/hpf) were included. In our study urine culture was found to be positive in only 72(18.2%) cases. The pyuria in culture negative samples (81.8%) could have been due to vaginal contamination and false positive result of urinalysis, whereas the symptoms could be due to pregnancy related changes. According to study conducted in Lahore[1], causative factors for lower urinary tract symptoms were pregnancy associated changes in 91.3% cases and urinary infection in 8.69% cases. In another study[14] , 46.5% women showed no growth on culture and they reported urinary symptoms due to pregnancy induced changes on urinary system. In present study the relationship between numbers of WBC's count on urinalysis with urine culture positivity

were also observed. Majority of urine culture positive cases in this study (24.2%) found when >21 WBC's/ hpf seen on Urine D/R, while 8(9.8%) positive urine culture seen with 6-10 WBC's/hpf on urine D/R. A study by Hanif[1] revealed that 8.69% women had positive culture with 6-20 WBC's on complete urine examination. In a study of UK [10], 47 cases out of 100 showed pus cells on urinalysis and urine culture found to be positive in only 2 cases. The difference in the result might be due to the selection criteria as they were taken only symptomatic women but in this study we taken symptomatic women with positive urine D/R. The current study indicates that one should not ignore even low count of WBC's in urine that can be associated with UTI. Urine culture should be done in all cases prior to starting antibiotics in pregnancy to avoid both overt treatment and under treatment. Although urine cultures are expensive, require laboratory expertise and take 24-48 hrs for results, urine culture remains the gold standard for diagnosis of UTI in pregnancy as the result of rapid urine screening tests in pregnancy is poor[19]. Urinary tract symptoms are known to be common in pregnancy. In our study the most common symptom was frequency (72.7%) followed by dysuria (32.9%) and urgency (14.1%) respectively. Hanif[1] reported frequency (87%) as common symptom followed by urgency (43.6%), while another study showed abnormal voiding pattern (40.5%) as the commonest urinary symptom. In a study by Sheikh et al[20] , percentages of frequency, dysuria and urgency were 32.6%, 21.2% and 31.3% respectively. The study results are not comparable with other studies and it could be due to racial factors, gestational age at which population was examined and different selection criteria. The frequency of urine culture positivity with age, parity and gestational age were also noted in the study. Majority of culture positive women were in the age group 21-25 years, multiparous and had gestational age of 21-30 weeks which is comparable to the other studies[16,21]. The most common pathogens recovered from urine sample were E. coli (43%) followed by Staphylococcus aureus (22.4%). The study findings are similar to Al-Haddad[17], Hanif[1] and others[20,22]. In other studies[22,23] ,Klebsiella and Enterobacter spp was the common organism detected after E.coli. Sensitivity pattern has been studied in different studies and revealed that resistance has been observed with commonly prescribed medicines such as Amoxicillin, Co-trimoxazole and first generation of Cephalosporin[21,22]. The study emphasizes the importance of urine culture in pregnancy before prescribing antibiotics in order to reduce the resistance and unnecessary antibiotic prescription. In the view of the study results, by sending urine culture in every symptomatic pregnant woman with positive urine D/R, we could not only do safe practice but also reduce the cost of treatment by avoiding unnecessary antibiotic prescription. It is necessary to investigate properly all pregnant women for urinary tract infection and Urine C/S is mandatory to establish or exclude UTI. In our study only 72 women had positive urine culture and only these women required antibiotic prescription, while the rest of the women didn't require antibiotic. This study helps us in understanding that urine culture is a gold standard for diagnosis of UTI in pregnancy.

Further studies needs to be performed in the future in pregnant women, in which the relationship of urine culture positivity with the possible risk factors such as personal hygiene, education level, socioeconomic status, frequency of sexual intercourse, past history of urological problems should be examined.

CONCLUSION

In the study we concluded that there is little association of urinary symptoms and positive urine detail report with urine culture positivity. Urinary symptoms are common in pregnancy which might be due to physiological changes of pregnancy in the majority and UTI is responsible for symptomatology in only a minority. In the view of study results urine D/R with >5 WBC's count should be followed by urine culture and sensitivity test in every symptomatic pregnant women for cost effective treatment and to avoid unnecessary antibiotic prescription as well as antibiotic resistance.

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* Researcher and writing the manuscript, ** Write up and correction
*** Review the manuscript **** Concept of the articlle

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