

FREQUENCY AND SENSITIVITY PATTERN OF ESCHERICHIA COLI CAUSING URINARY TRACT INFECTION IN PREGNANT WOMEN OF GADAP, KARACHI, PAKISTAN

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ABSTRACT

A cohort of 139 pregnant women, attending the antenatal clinics of Baqai Medical University, was included in the study. All women underwent complete examination, their urine sample were collected. Those who had one or more urinary complaints had culture and sensitivity test of urine. Out of 139 pregnant women visited in the above duration the most common complaints were burning micturition, frequency and urgency. In this study 100 samples were positive (71.9%) for culture. Organisms isolated were *Escherichia coli* 45%, *Staphylococcus aureus* 15%, *Citrobacter* spp 11%, *Pseudomonas* spp 6%, *Klebsiella* was found in 5% of the cases. *Proteus mirabilis*, *proteus vulgaris*, and *Enterobacter* spp each was found in 2% of the cases. Apart from above mentioned bacterial growth, in 12% of the cases *Candida* species were isolated. The *E. coli* was highly susceptible to Ampicillin, Augmentin, Amoxil, Ampiclox, and Cloxacillin.

Keywords: Escherichia Coli, Urinary tract infection, pregnant women

INTRODUCTION

Urinary tract infections (UTI) are the most common bacterial infections during pregnancy. Two types of clinical entities are observed in UTI during pregnancy symptomatic and asymptomatic bacteruria. Two clinical entities are recognized with a symptomatic UTI, the lower UTI (i.e., cystitis) and upper UTI (i.e., pyelonephritis). In general, pregnant women are considered immunocompromised, UTI hosts because of the physiologic changes associated with pregnancy, increasing a healthy, pregnant woman's chance of serious infectious complications from symptomatic and asymptomatic urinary infections' (Khattak *et al.*, 2006).

Asymptomatic bacteruria (ASB) is commonly defined as the presence of more than 100,000 organisms per milliliter. Untreated ASB is a risk factor for acute cystitis and pyelonephritis in pregnancy (Graham *et al.*, 2001). UTI is defined as significant bacteruria in the presence of symptoms (Birgit, *et al.*, 2006). It affects an estimated 20% of women at some time during their lifetimes and 2 to 10 % in pregnant women (Jean *et al* 2005).

There are an estimated 150 million UTIs per annum world wide and it is the most common bacterial infections in women. *E. coli* is the primary urinary tract pathogen accounting for 75 to 90% of uncomplicated UTIs isolates (Kalpana *et al.*, 2001). *E. coli* is usually able to express a number of adherence factors including adhesins, siderophores, toxins, capsules, and a protease that promote initial colonization and allow persistence in the phase of regular urine (Lixin *et al.*, 2000). Less commonly isolated organisms from patients are *Saph. saprophyticus*, *Klebsiella*, *Proteus*, *Enterobacter* spp and other pathogens (Walter *et al.*, 1993, Lindgren *et al.*, 2003).

Although UTI in pregnancy is a common medical problem, very little is known about the susceptibility patterns of bacteria causing UTI especially, in low socioeconomic countries. About 90% of *E. coli* causing UTI is still susceptible to nitrofurantoin, a relatively inexpensive and safe drug. However, less than 25% of doctors used it for treatment of cystitis (Sabir *et al.*, 2004). Cephalosporins were most commonly used in hospital practice for the treatment of UTI. Amoxicillin was being used widely to treat UTI in pregnancy in spite of high prevalence of resistance (Elizbieta *et al.*, 2003).

MATERIAL AND METHOD

The present study was conducted during May to November 2005. A cohort of 139 pregnant women visiting at Fatima Hospital, Baqai Medical University of Karachi included in this study. These women belonged to lower middle class of Gadap Town. The mid stream urine were collected and analyzed physically, chemically and microscopically. They were cultured for the isolation of microorganisms. The urine samples were cultured on cystine lactose electrolyte deficient (CLED) Agar. Inoculation was done with the help of a 0.001ml caliber loop. They were incubated for 48 hrs at 37°C in aerobic conditions. A colony count of 100,000 colony-forming units (CFUs) per milliliter historically has been used to define a culture to be positive. Bacterial identification was done

by standard biochemical tests. Antimicrobial susceptibility was tested following Kirby-Bauer's disk diffusion method (Kalpana *et al.*, 2001). The antibiotic sensitivities of the microorganisms were observed.

RESULTS AND DISCUSSION

During May 2005 to November 2005, a total of 139 urine samples were obtained from pregnant women and screened for bacteraemia. The culture were positive in 100 specimens (71.9%) and negative in 39 (28.1%) specimens.

The physiological changes associated with pregnancy, such as the relaxation of the uterus and the effect of hormones results in susceptibility towards UTI. These hormones are trophoblastic in origin and they increase urinary output, result in urinary stasis. The chemical composition of urine is also affected and due to increased urinary concentration of substance, such as glucose and amino acids that may facilitate bacterial growth. Furthermore the enlarging uterus compresses the ureter as pregnancy advances. Seventy three percent of UTI in pregnant females was asymptomatic, a few of the pregnant female were found with complains of burning micturition, uneasiness in micturition as also reported by Yashodhara *et al.*, (1987).

Table .1 Frequency of different microorganisms isolated from positive samples.

Organisms	Percentage
<i>Staphylococcus aureus</i>	15
<i>Proteus mirabilis</i>	2
<i>Proteus vulgaris</i>	2
<i>Klebsiella Species</i>	5
<i>Enterobacter Species</i>	2
<i>Citrobacter Species</i>	11
<i>Candida Species</i>	12
<i>Pseudomonas Species</i>	6
<i>Escherichia coli</i>	45
Total	100

Table.2. Antimicrobial sensitivity pattern of *E.coli*.

Antibiotics	Number of Cases tested	Sensitivity	%	Resistance	%
Ampicillin	45	45	100%	0	0
Augementin	45	45	100%	0	0
Amoxil	45	45	100%	0	0
Ampiclox	45	45	100%	0	0
Cloxacillin	45	45	100%	0	0
Claforan	43	13	30.20%	30	69.70%
Ceporex	44	14	31.80%	30	68.10%
Ceclor	44	12	27.20%	32	72.20%
Ciproxin	45	45	100%	0	0
Doxycycline	44	21	47.70%	23	52.20%
Fortan	44	15	34%	29	65.90%
Gentamycin	44	29	72.50%	11	27.50%
Minocin	40	3	0.75%	37	92.50%
Noroxin	38	38	100%	0	0
Nalidixic acid	45	40	88.80%	5	11.10%
Pipemidic acid	23	12	52.10%	11	47.80%
Tarivid	29	9	31%	20	68.90%

The commonest microorganism was *E.coli* (45%). Other studies also showed the most common uropathogen in the pregnant patient is *E.coli*. Similar study was conducted in Lahore by Shamayela (2006) who observed *E.coli* to be present in 89.1% of cases. This organism is isolated in 80-85% of cultures the world over (Jesus *et. al.*, 2006). Our results are therefore consistent with other studies. According to a research report from Oxford Radcliff Hospital *E.coli* is responsible for 74% of UTI in pregnancy (Hansen, 2004). In present study the prevalence of other pathogens was *staphylococcus aureus* 15% *citrobacter* 11% *Pseudomonas* 6% *Klebseilla* was found 5% of these cases *Proteus mirabilis* 2% *Proteus vulgaris* 2% and *Enterobacter* was found in 2 % of the cases. Similar results were found in the study done at Aga Khan University Hospital. (Farooqi *et. al.*, 2000).

The susceptibility of *E. coli* to antibiotics such as ampicillin, augmentin, amoxil, ampicolx, and cloxacillin was 100% for all 45 *E.coli* positive cases. Similar results were observed in many other studies from Pakistan (Hussain 2000) or elsewhere (Orrett and Shurland 1998).

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