Indian Journal of Basic and Applied Medical Research; September 2018: Vol.-7, Issue- 4, P . 87 – 90

Original article:

Bacteriological Evaluation among Patients with Urinary Tract Infection: an Institutional Based Study

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Acceptance Date 24 April 2018

ABSTRACT

Background: Urinary Tract Infections (UTIs) have been proven to be the most encountered bacterial infection in humans, affecting all age groups and gender in both the community and hospital settings. The present study was conducted for bacteriological evaluation among patients with urinary tract infection.

Materials & Methods: The present study was conducted on 438 patients (males- 180, females- 258). In all subjects, freshly voided urine samples were collected into sterile screw capped plastic universal containers containing a few crystals of boric acid as preservative. Each urine sample was aseptically inoculated onto the MacConkey agar plates, Mannitol salt agar plates, Salmonella-Shigella agar and Cetrimide agar plates. The inoculated agar plates were incubated at 37°C for 24 h.

Results: Common pathogens were E. coli (128), S. aureus (110), C. albicans (86), Klebsiella aerogenes (72) and proteus spp (42). The difference was significant (P< 0.05). Age group 21-30 years had 42 males and 56 females, 31-40 years comprised of 52 males and 76 females, 41-50 years comprised of 60 males and 64 females and 51-60 years comprised of 26 males and 62 females.

Conclusion: UTI is common among females as compared to males. Common pathogens were E. coli, S. aureus, C. albicans, Klebsiella aerogenes and proteus spp.

Key words: Candida, Klebsiella, UTI.

INTRODUCTION

Urinary Tract Infections (UTIs) have been proven to be the most encountered bacterial infection in humans, affecting all age groups and gender in both the community and hospital settings. About 50% of all females will experience at least an episode of UTI during their lifetime. Asymptomatic bacteriuria and urinary tract infection (UTI) are common among adult men and women; although the incidence is higher among women due to their anatomy. They also have a higher prevalence among women during pregnancy and in very sexually active females.[1]

Asymptomatic bacteriuria denotes significant bacteriuria (> 105 CFU/mL of urine) without clinical symptoms of urinary tract infections (such as frequent urination, painful urination or fever) or other abnormal findings. The bacteriuria should not be due to contamination from urine sample collection.[2]

Urinary tract infection occurs more frequently in females than males due to the shortness and width of the female urethra to the vagina which makes it liable to trauma during sexual intercourse as well as bacteria being passed from the urethra into the bladder during pregnancy. The moist environment of the female's perineum favours microbial growth and predisposes the female bladder to bacterial contamination. In addition, urine of females was found to have more suitable pH and osmotic pressure for the growth of Escherichia coli than urine from males.[3] Different

factors were identified likely to increase risk of UTI during pregnancy, including the history of UTI, sexual activity, history of catheterization, lower socioeconomic status, and multiparity.[4] The present study was conducted for bacteriological evaluation among patients with urinary tract infection.

MATERIALS & METHODS

The present study was conducted in the department of Microbiology of Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India. It comprised of 438 patients of both genders (males- 180, females- 258). All were informed regarding the study and written consent was obtained. Ethical clearance was taken prior to the study.

In all subjects, freshly voided urine samples were collected into sterile screw capped plastic universal containers containing a few crystals of boric acid as preservative. All samples were appropriately labeled. MacConkey agar, Mannitol salt agar, Cetrimide agar and Salmonella-Shigella agar were prepared according to their manufacturers' specifications and sterilized in the autoclave by heating at 121°C for 15 minutes. Each urine sample was aseptically inoculated onto the MacConkey agar plates, Mannitol salt agar plates, Salmonella-Shigella agar and Cetrimide agar plates. The inoculated agar plates were incubated at 37°C for 24 h. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

RESULTS

Table I shows that common pathogens were E. coli (128), S. aureus (110), C. albicans (86), Klebsiella aerogenes (72) and proteus spp (42). The difference was significant (P< 0.05).

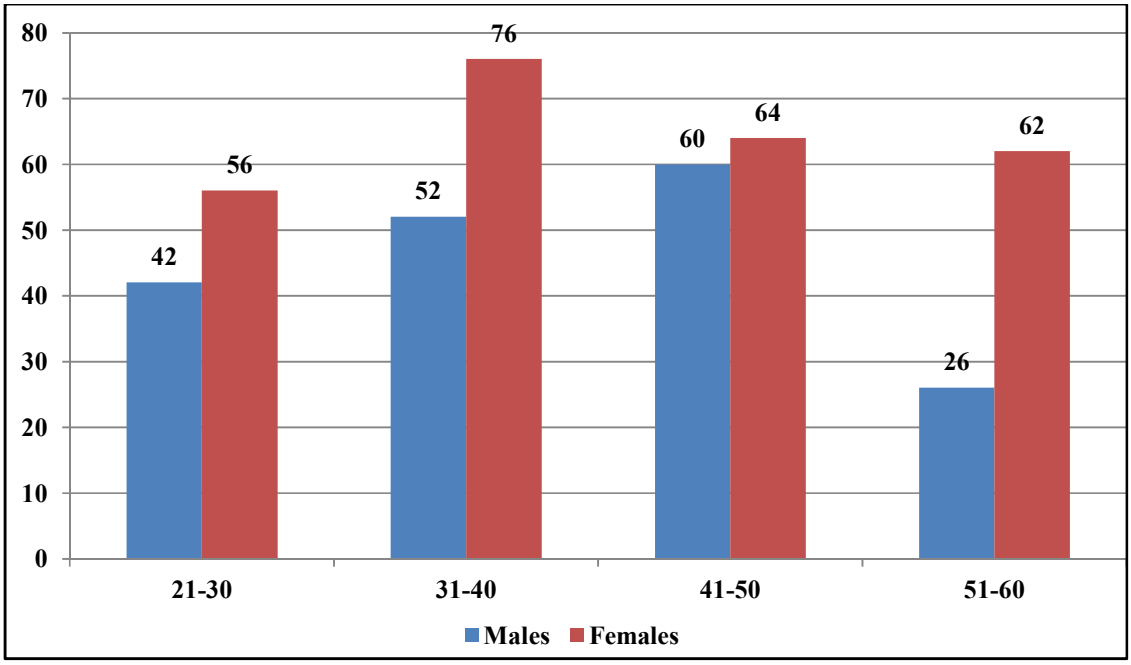
Graph I shows that age group 21-30 years had 42 males and 56 females, 31-40 years comprised of 52 males and 76 females, 41-50 years comprised of 60 males and 64 females and 51-60 years comprised of 26 males and 62 females.

2012; 22(2):121–128.

Table I: Pathogens found in samples

Pathogens	Number of stains	%
Escherichia coli	128	29.22%
Staphylococcus aureus	110	25.11%
Candida albicans	86	19.63%
Klebsiella aerogenes	72	16.43%
Proteus spp	42	9.58%

Graph I: Age wise distribution of cases



DISCUSSION

UTI is an infection that affects any part of the urinary tract from the bladder to the kidney. It is not classified as a sexually transmitted infection although sexual activity is known to be a risk factor. Symptoms include frequent and/or painful urination, a feeling to urinate despite having an empty bladder, fever and flank pain. At times, the urine may contain pus and/or appear bloody.[5]

When it affects the lower urinary tract it is known as a bladder infection (cystitis) and when it affects the upper urinary tract it is known as kidney infection. Symptoms from a lower urinary tract include frequent urination, and feeling the need to urinate despite having an empty bladder. Symptoms of a kidney infection occur usually in addition to the symptoms of a lower UTI. Blood may be present in urine. In the very old and the very young, symptoms may be vague or non-specific.[6]

UTI is a risk factor for pyelonephritis, preterm delivery and miscarriages among pregnant women, and is associated with impaired renal function and end-stage renal disease among pediatric patients. The present study was conducted for bacteriological evaluation among patients with urinary tract infection.[7]

We found that common pathogens were E. coli (128), S. aureus (110), C. albicans (86), Klebsiella aerogenes (72) and proteus spp (42). This is in agreement with Shah et al.[8]

In present study, age group 21-30 years had 42 males and 56 females, 31-40 years comprised of 52 males and 76 females, 41-50 years comprised of 60 males and 64 females and 51-60 years comprised of 26 males and 62 females. This is similar to Arvind et al.[9]

www.ijbamr.com P ISSN: 2250-284X , E ISSN : 2250-2858

Ramesh et al[10] found that the uropathogens isolated included Staphylococcus aureus (33.1%), Escherichia coli (20.8%), coagulase negative Staphylococci (15.6%), Klebsiella aerogenes (7.9%), Coliform organisms (7.9%), Candida albicans (7.9%) and Proteus spp (6.8%) of which gram negative bacilli and gram positive bacteria accounted for 43.4% and 48.7% respectively. Candida albicans, a fungal uropathogen accounted for 7.9%. Occurrence of UTI in male and female students was 57.1% and 42.9% respectively of which UTI occurred highest in the 21 – 25 age group. More than 50% of isolated bacterial strains were sensitive to gentamicin only with more than 90% resistant to augmentin and nalidixic acid.

Behal el al[11] in their study found that the prevalence of significant bacteriuria was 14%. Gram-negative bacteria were more prevalent (73%). Escherichia coli (34.6%), coagulase-negative staphylococci (19.2%), Pseudomonas aeruginosa (15.4%), and Klebsiella spp. (11.5%) were common bacterial isolates, where most of them were resistant against ampicillin, amoxicillin, tetracycline, trimethoprim–sulfamethoxazole, and chloramphenicol. Multidrug resistance was seen in 100% of the isolated bacteria. A majority of the bacterial isolates were sensitive to ciprofloxacin, ceftriaxone, erythromycin, and gentamicin.

CONCLUSION

UTI is common among females as compared to males. Common pathogens were E. coli, S. aureus, C. albicans, Klebsiella aerogenes and proteus spp.

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