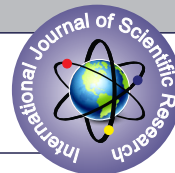


BACTERIOLOGICAL PATTERN IN URINARY TRACT INFECTIONS IN PATIENTS ATTENDING PMCH, PATNA



Microbiology

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ABSTRACT

INTRODUCTION-Urinary tract infections (UTI) refers to both microbial colonization of urine and tissue invasion of any structure of urinary tract. Bacteria are most commonly responsible although viruses and yeast may also be involved. Bacterial count 1,00,000 or more in an aseptically collected urine is known as significant bacteriuria. Amongst bacteria *E.coli* and *klebsiella* are the most common pathogen. **MATERIAL AND METHOD**- A total of 126 samples were collected from patients attending outdoor department of PMCH, Patna. Patients should have signs and symptoms suggestive of UTI. Culture and identification of organism was done. **OBSERVATION AND RESULT** – Female were more commonly affected than men. *E.coli* was most common pathogen followed by *Klebsiella* species. **DISCUSSION**- Females are more vulnerable than male for UTI due to anatomical and physiological factors (Schappert, 1977). In present study female cases were 64.86% of total cases supports this fact. Manjunath GN et al also had *E.coli* as the most important pathogen which was similar to the present study.

KEYWORDS

INTRODUCTION

Urinary tract infections (UTI) refers to both microbial colonization of urine and tissue invasion of any structure of urinary tract. Bacteria are most commonly responsible although viruses and yeast may also be involved. UTI are one of the most common types of bacterial infections in humans. UTI encompass a spectrum of clinical entities ranging in severity from asymptomatic infection to acute cystitis, prostatitis, pyelonephritis and urethritis. Most infections are caused by retrograde ascent of bacteria from faecal flora via urethra to the bladder and kidney especially in females have shorter urethra and is most readily transverse by microorganism. Amongst bacteria *E.coli* and *klebsiella* are the most readily transverse by microorganism.

Amongst bacteria *E.coli* and *klebsiella* are the most common pathogen.

Bacterial count 1,00,000 or more in an aseptically collected urine is known as significant bacteriuria. Count between 10,000 to 1,00,000/ml of urine them bacteriuria is of doubtful significance. When count is less than 10,000/ml of urine it is of no significance and no treatment is required. Untreated bacteriuria can be lead to urinary tract infections in pregnancy.

Extremes of age, female gender, pregnancy, instrumentation, neurological dysfunction, renal disease and expression of A, B and H blood group oligosaccharides on the surface of epithelial cell are predisposing factor for development of UTI. Community acquired urinary tract infection are one of the most common UTI among female. Bacteriological profile is important in UTI so that proper diagnosis and treatment may be started on time.

MATERIAL AND METHODS

A total of 126 samples were collected from patients attending outdoor department of PMCH, Patna. Patients should have signs and symptoms suggestive of UTI e.g:-

- Patients have at least one of the following signs and symptoms with no other recognised cause fever, urgency, dysuria or suprapubic tenderness.
- Patients having history of antibiotic used within one week were excluded from study.
- Freshly voided midstream urine samples (10-20ml) were collected from non catheterized patients in a wide mouthed sterile container after cleaning the genitals properly. The specimens were delivered to the laboratory immediately and processed within two hours, if stay in processing then it should be stored at 4°C.

CULTURE AND IDENTIFICATION

Urine specimens are then inoculated on MacConkey agar, Cled (Cysteine lactose electrolyte deficient agar) and blood agar using Platinum loop SWG no 28. Plates are then incubated at 37°C for 24 hours. All cultures showing growth and colony count of >

100000 CFU/ml of urine was considered significant.

All positive cultures were further identified by their characteristic appearance in media, gram's staining, motility and confirmed by biochemical reactions.

OBSERVATION AND RESULTS

Female predominance in total cases, females were 65.33% of total while were 34.66% of total cases.

Table 1 : Showing distribution of complicating factors in Complicated UTI cases

Complicating factor	No. of cases
Male gender	26
Pregnancy	10
Elderly	7
Diabetes	1
Childhood UTI (newborn to 12 year)	18
Indwelling urinary catheter	16
Hospital acquired infection	19
Symptoms more than 7 days at presentation	37
Fever more than 3 days	15
Functional or structural urinary tract anomaly	16
Failed response to antimicrobial therapy	28
Obstruction (e.g. stone, uretero-pelvic junction obstruction)	2

Table 2 : Showing uropathogens isolated in Uncomplicated UTI cases

Organism	In Number	Percentage
<i>Escherichia coli</i>	6	54.54%
<i>Klebsiella</i> spp.	4	36.36%
Coagulase-negative-staphylococci	1	9.10%
Total	11	100%

Table 3: Showing distribution of uropathogens in complicated UTI cases

Organism	No. of isolate	Percentage
<i>E.coli</i>	16	39.39%
<i>Klebsiella</i> spp.	13	19.70%
<i>Pseudomonas</i> spp.	12	18.18%
Coagulase-negative-Staphylococci	3	4.55%
<i>S.aureus</i>	2	3.03%
<i>Enterococcus</i> spp.	2	3.03%
<i>Enterobacter</i> spp.	1	1.52%
<i>Citrobacter</i> spp.	1	1.52%
<i>Candida</i> spp.	6	9.09%
Total	66	100% (approx)

Table 4 : Showing Age and Sex-wise distribution and frequency of UTI cases

Sex	Male		Female		Total (Male+Female)	
Age group	No. of study subjects*	No. of culture positive cases**	No. of study subjects	No. of culture positive cases	Total no. of subjects	Total no. of culture positive cases
Newborn-10 year	14	8	6	4	20	12
>10-20 year	6	4	16	10	22	14
>20-30 year	6	5	26	18	32	23
>30-40year	7	4	17	6	24	10
>40-50 year	2	1	11	8	13	9
>50-60year	4	2	2	1	6	3
>60-70 year	2	2	3	2	5	4
>70-80year	3	0	1	0	4	0
Total	44	26	82	49	126	75

Author	Place	Duration	Sets	E.coli (In %)	Klebsiella in %	Pseudomonas spp. (In %)	Staphylococcus spp. (In%)	Proteus spp. (In %)	Enterococcus spp. (In %)	Citrobacter spp. (In %)	Acinetobacter spp. (In %)	Enterobacter spp. (In %)	Candida spp. (In %)
Manjunath GN	Tumkur & Bangalore	2005-10	OPD & Inward	59	12	9	0.42	0.7	10	4	2.3	0.9	1
R Bidhudutta	Bhubaneswar	2009-10	OPD & Inward	38	17	10	4		11	3	1	2	14
Dr P Gupta	Gandhinagar	2011-12	OPD & Inward	47	18	7	8	3		7	3		9
Jyoti Sharma	Amalapur	2007	OPD & Inward	44	11	6	6		8		5		8
IN present study	Ranchi	July 2013-august-2014	OPD & Inward	42	22	16	8		2.6	1.3		1.3	8

Most common complicating factor amongst cases found in present study was symptoms for more than 7 days duration not responding to antibiotic therapy. Reason behind this may be increased resistance to commonly prescribed antibiotics for UTI or anatomical or functional abnormality of urinary tract that acts as a favorable factor for UTI.

In total of 51 cases which had symptoms of UTI (dysuria, frequency, fever burning micturation), culture were found to be negative in present study. In these cases either insignificant growth or no growth was found. Reason behind this may be infection due to some fastidious organisms or by the organisms that can not be grown by aerobic culture method used in this study, like *Nisseria gonorrhea* and *Chlamydia trachomatis*. In paediatric age group, *Adenovirus* can be etiological cause. Some studies e.g. Finegold, 1977 and Gorbach and Barlett, 1974, suggested etiological role of anaerobic organisms in UTI and this may be cause of culture negative result by method used in present study. *Mycobacterium tuberculosis* and other non tuberculous mycobacteria may be infective cause in UTI especially in Upper tract infections as found in the study by Brooker and Aufderheide in 1980, in these cases sterile pyuria may be found.

One technical error is the concept of significant growth, which means usually the growth of uropathogens in UTI cases more than 100000CFU/ml of organisms is found in culture of urine. Chances that organism grown less than this value can be true pathogens and not contaminant. So chances are there that some case showing low number of growth were true infection.

In almost all studies in the world including India, *E. coli* has been stamped as the most common organism in UTIs. It is most common organism in all types of sets like complicated and uncomplicated UTIs or Hospital and community acquired UTIs. In study by Kahlmeter 2000; Ronald 2002; Wagenlehner 2002; Bouza 2002, it was found that *E.coli* was the most common organism in all types of set.

DISCUSSION

Females are more vulnerable than male for UTI due to anatomical and physiological factors (Schappert, 1977). In present study female cases were 64.86% of total cases supports this fact.

In female population clustering of cases was seen in age group 10 to 40 years with peak at 20 to 30 years in present study. Kunin, 1987 had found this type of trend. Many reasons may be to behind this fact, like increasing sexual activity hormonal changes, pregnancy etc. This was suggested in a study by Moore EE, Hawes SE, Scholes D, et al.2008, Hooton & foxman,2001. These all may be the reasons supporting this finding.

In early age group, more UTI cases were found in male patients than in female patients in present study. In early age group gentio-urinary abnormalities are more common in male child. In 8 cases of males, 2 have such abnormality. In 3 other cases urinary catheter was present as a risk factor amongst admitted patients. Lack of circumcision also may be a predisposing factor as suggested by Craig JC et al, 1996.

In elderly male population amongst total of 4 cases, 2 were diagnosed cases of BPH and one more case was of Kidney stone. This may be the reason behind that number of male cases were comparable to female cases in elderly age group .In studies by Boscian an Kaye 1987 and luthani-Mehta 1987 increasing bacteriuria in elderly especially male population was found and this was also found in present study, but low number of female patient as found in present study is not concordant with their finding.

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