

Pattern of Bacteria Causing Urinary Tract Infections of inpatients and outpatients department at Anwer Khan Modern Medical College Hospital

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ABSTRACT

The most common nosocomial infection is Urinary tract infection (UTI) among hospitalized patients as well as UTI is an important health problem in the community. The knowledge about the type of pathogens responsible for UTI and at a specific area may help the doctors to choose correct treatment regimen. This study was aimed at to investigate the pattern of isolated urinary pathogens. This study was done at Anwer Khan Modern Medical College Hospital, Dhaka during January-June, 2011. Out of 498 clinical samples of urine collected, 245 (49.19%) showed significant bacterial growth. The most common pathogens isolated were *Escherichia coli* (142, 58.0%), *Streptococcus faecalis* (38, 15.5%), *Pseudomonas* (20, 8.2%), *Klebsiella* species (20, 8.2%) and *Staphylococcus epidermidis* (14, 5.7%). The clinicians should use antibiotics according to pattern of causative agents that cause UTI in such setting.

Key Words: Urinary Tract Infection, Nosocomial Infection, *Escherichia Coli*, *Klebsiella* Species

Introduction

Urinary tract infection (UTI) is one of the most important causes of morbidity in the general population, and is the second most common cause of morbidity among hospital visitors¹. With advancing age, the incidence of UTI increases in men due to prostate enlargement and neurogenic bladder². Recurrent UTI are common and can lead to irreversible damage to the kidneys, resulting in renal hypertension and renal failure in severe cases³. In the community, women are more prone to develop UTI. It has been observed that about 20% of the women experienced a single episode of UTI during their lifetime, and 3% of women had more than one episode of UTI per year⁴. Pregnancy also makes the women more susceptible to the infection⁵. Catheter-associated UTI is a trenchant problem with about 10% of the patients developing bacteriuria⁶.

It is universally accepted that UTI can only be ascertained on the basis of microscopy and

microbial culture of urine. The dip stick method used in many centres serves only as a screening method but culture is needed for final diagnosis⁷. In almost all cases of nosocomial UTI, there is a need to start treatment before the final microbiological results are available. knowledge about the types of pathogens responsible for UTIs and their resistance pattern may help the clinician to choose the correct empirical treatment.

Studies from India, Bangladesh and Nepal have reported an increased resistance of the urinary pathogens to commonly used antibiotics⁸⁻¹⁰. Any information from similar studies was not available in this hospital. Hence, this study was undertaken to find out the frequency pattern of urinary pathogens isolated from urine samples of suspected cases of UTIs at Anwer Khan Modern Medical College Hospital, Dhaka.

Methods

This was a cross-sectional study conducted at the department of Microbiology, Anwer Khan Modern Medical College Hospital, Dhaka.

The samples of urine were obtained from patients of various clinical wards and outpatients department of Anwer Khan Modern Medical College Hospital, Dhaka, during the period of January, 2011 to June, 2011.

The patients having suggestive symptoms and /or signs were suspected as cases of UTI. Urine samples were collected by standard mid-stream clean-catch method from all the cases. Urine samples were also collected from catheterized patients. The samples were inoculated on the Blood agar and MacConkey agar media by calibrated wire loop and incubated at 37°C overnight. The plates were observed for colony morphology, Gram-stain characteristics and relevant biochemical tests¹¹. Culture results were interpreted according to the standard criteria and a growth of 10⁵ colony forming units/ml was considered as significant bacteriuria¹².

Results

Out of 498 samples of urine, 245 (49.19%) showed significant growth of uropathogens. Considering age distribution of the culture-positive case, 49 (20.0%) were children aged 10 years or less, and 64 (26.1%) were aged 41-60 years. In all age groups, females were more frequently affected than males. (Table I)

Table I: Age and sex distribution of the culture positive urine samples

Age groups in years	No of samples from		Total
	male	female	
0-10	23	26	49 (20.0%)
11-20	4	9	13 (5.3%)
21-40	15	54	69 (28.2%)
41-60	25	39	64 (26.1%)
> 60	19	31	50 (20.4%)
Total	86	159	245

The commonest organisms isolated were *Escherichia coli* (142, 58.0%) and *Str.feacalis* (38, 15.5%), *Pseudomonas* species (20, 8.2%), *Klebsiella* species (20, 8.2%) and others including *Coagulase-negative Staphylococcus* (14, 5.7%). (Table II)

Table II: Distribution of bacterial isolates among 245 culture positive cases.

Name of male organism	female	Total	(%)	95% CI
<i>E.Coli</i>	46	96	142 (58.0%)	49.9 - 66.1
<i>Str.feacalis</i>	14	24	38 (15.5%)	4.0 - 27.0
<i>Pseudomonas</i>	11	9	20 (8.2%)	-3.8 - 20.2
<i>Kl.pneumonia</i>	5	15	20 (8.2%)	-3.8 - 20.2
<i>Sta.epiermidis</i>	6	8	14 (5.7%)	-6.4 - 17.8
<i>Proteus</i>	2	2	4 (1.6%)	-10.7 - 13.9
<i>Aceenato bacter</i>	1	2	3 (1.2%)	-11.1 - 13.5
<i>Citrobacter</i>	1	2	3 (1.2%)	-11.1 - 13.5
<i>Sta.saprophyticus</i>	0	1	1 (0.4%)	-12.0 - 12.8
Total	86	159	245	

Discussion

Identification of the uropathogens and their susceptibility pattern is very important in treating the cases of Urinary Tract Infections (UTI). In the present study, urine specimens were cultured to see pattern of uropathogens and some 245 (49.19%) of the urine showed significant growth of bacteria. So, majority (50.81%) of the cases remaining showed either insignificant bacteriuria or no growth with urine from the suspected cases of UTI. Prior antibiotic therapy before submitting the urine samples, and clinical conditions like non-gonococcal urethritis or others that mimic UTI could be that factors responsible for insignificant bacteriuria or no growth of *Coagulase-negative Staphylococcus* which are supposed to be non-pathogenic. This indicates the need for educating the patients about the method of collection of clean catch mid-stream urine specimens.

The age and sex distribution of the patients diagnosed with UTI among the hospitalized patients and those attending the outpatient department followed the natural epidemiological pattern of UTI. There was a predominance of young and middle aged females, whereas in the children and younger age groups, almost equal proportions of male and females had UTI.

In the present study, the most common pathogens isolate was *Escherichia coli*-58.0%, followed by *Strp.feacalis*-15.5%, *Klebsiella* & *Pseudomonos*

species-8.2%, *Staphylococcus epidermidis* (5.7%), *Proteus* species (1.6%), *Acenatobacter* & *Citrobacter* (1.2%) and *Staphylococcus saprophyticus* (0.4%). The isolation rate of urinary pathogens of the present study is consistent with reports of the studies published elsewhere recently^{9,15,16}.

The patients attending outpatient department and some of the hospitalized patients may be having community-acquired UTI. In the present study, community-acquired UTI and nosocomial UTI were not been distinguished. This was the main limitation of the study.

A high isolation rate of pathogens from urine samples of clinically suspected UTI shows a good correlation between clinical findings and microbiological methods. Gram-negative bacteria were the commonest organism isolated, among which *E.coli* was the principal urinary pathogen. Since this was a cross-sectional study, further regular monitoring is required to establish reliable information about susceptibility pattern of urinary pathogens for optimal therapy of patients with nosocomial UTI.

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