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Research Article

URINARY TRACT INFECTIONS (UTI) AMONG PATIENTS AT BHANDARI POKHRI GOVERNMENT HOSPITAL, BHADRAK, ORISSA

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ABSTRACT
It has been estimated that symptomatic urinary tract infections (UTI) occurs in as many as 7 million visits to emergency units and 100,000 hospitalizations annually. UTI has become the most common hospital-acquired infection, accounting for as many as 35% of nosocomial infections, and it is the second most common cause of bacteraemia in hospitalized patients. Objective was to detect the prevalence rate of bacterial infection among urinary isolates from patients having UTI and to detect prevalence rate of drug resistance among pathogen isolate from patients having UTI. The prevalence of Urinary Tract Infections (UTI) was evaluated in 1665 patients attending Bhandaripokhri government Hospital, Bhadrak. Results showed 695 (41.74%) patients were positive. The most common organisms were *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, and Proteus mirabilis*. In-vitro antibiotic susceptibility tests revealed that the gram negative bacteria were sensitive to Fluroquinolones (Ofloxacin, Levofloxacin) and meropenum, while the gram positive isolates were sensitive to Linezolid, Erythromycin & Fluroquinolones (Ofloxacin, Levofloxacin). The findings suggested the need for constant monitoring of susceptibility of specific pathogens in different populations to commonly used anti-microbial agents.

Key Words*: Urinary Tract Infections, Antibiotic Susceptibility*

INTRODUCTION
Urinary tract infection (UTIs) are the second most common infectious cause for consultation and prescription of antibiotics among family physicians and are a common cause of morbidity in institutional care. Most infections are limited to the lower urinary tract but may cause pylonephritis and bacteremia. The global incidence is estimated to be 2-3% or at list 150 million cases per annum, costing billions of dollars annually (Cohen *et al.*, 2003).
In the first 3 months of life UTI are about more common in males than females. The prevalence of bacteriuria in preschool and school aged is 30 times higher than that in boys; 5-6% will have had at least one episode of bacteriuria during their school age years (Akhta *et al.,* 2000)..
Gram negative enteric constitutes a serious problem in urinary tract infection in many parts of the world. It has been estimated that symptomatic urinary tract infections (UTI) occurs in as many as 7 million visits to emergency units and 100,000 hospitalizations annually. UTI has become the most common hospital-acquired infection, accounting for as many as 35% of nosocomial infections, and it is the second most common cause of bacteraemia in hospitalized patients (Akhta *et al.,* 2000). UTI accounts for a significant part of the work load in clinical microbiology laboratories and enteric bacteria particularly *Escherichia coli* remain the most frequent cause of UTI, although the distribution of pathogens that cause UTI is changing (Sklar *et al.,* 1987). There are several factors and abnormalities of UTI that interfere with its natural resistance to infections.

These factors include sex and age disease, hospitalization and obstruction in urinary tract. Females are however believed to be more affected than males (Acharya *et al.,* 1992). This is as a result of shorter and wider urethra. The anatomical relationship of the female's urethra and the vagina makes it bacteria been massaged up the urethra into the bladder during pregnancy and child birth. UTI is challenging, not only because of the large number of infections that occur each year, but also because the diagnosis of UTI

is not always straight forward. UTI has to be distinguished from other diseases that have a similar clinical presentation, some UTIs are asymptomatic or present with atypical signs and symptoms, and the diagnosis of UTI in neutropenic patients (who do not typically have pyuria) may require different diagnostic criteria than those used for the general patient population. Because of these factors, much reliance is placed on laboratory tests to augment clinical impressions; even when clinical diagnoses are unequivocal. It therefore comes as no surprise that the laboratory tests to identify the cause of the infections and/or to provide isolates for anti-microbial susceptibility.

The purpose of this study is to summarize the laboratory diagnoses of routine UTI and the antimicrobial susceptibility pattern of isolates .

The region between the anus and urethra is normally colonized by specialized flora including lactobacilli that inhibits colonization with enteric organisms. Spermicides (nonoxynol-9), diaphragms, estrogen deficiency and antibiotics (particularly β lactum) may cause reduction in these organisms and increase colonization by enteric organisms including uropathogens (Kas *et al.,* 1957).

MATERIALS AND METHODS

Study Population

The study population was drawn from indoor patients at IMS SUM Hospital & Medical College, Bhubaneswar. 1665 patients not clinically diagnosed as having UTI were involved in the study. Clinically diagnosed patients as UTI and patients on antibiotic therapy were excluded.

Study Duration

May 2011 to June 2012

Collection of Urine Samples

Early morning mid-stream urine samples were collected using sterile, wide mouthed container with screw cap tops. On the urine sample bottles were indicated name, age, sex, and time of collection along with requisition forms. The samples were analyzed bacteriological using the methods (NCCLS 1993).

Sample Processing

Culture

A calibrated sterile nicrom wire loop for the semi-quantitative method was used for the plating and it has a 4.0 mm diameter designed to deliver 0.01 ml. A loopful of the well mixed urine sample was inoculated into duplicate plates of Blood and Mac-Conkey agar. All plates were then incubated at 37ºC aerobically for 24 h.

The plates were then examined macroscopically and microscopically for bacterial growth. The bacterial colonies were counted and multiplied by 100 to give an estimate of the number of bacteria present per milliliter of urine. A significant bacterial count was taken as any count equal to or in excess of 10,000 cfu /ml (NCCLS 1993).

Microscopy

The urine samples were mixed and aliquots centrifuged at 5000 rpm for 5 min. The deposits were examined using both 10X and 40X objectives. Samples with ≥10 white blood cells/mm3 were regarded as pyuric. A volume of the urine samples were applied to a glass microscope slide, allowed to air dry, stained With gram stain, and examined microscopically. Bacterial isolates were identified generally using biochemical reaction (NCCLS 1993).

Antibiotic Susceptibility Testing

Antimicrobial susceptibility testing was performed using the disk diffusion method as described by the National Committee for Clinical Laboratory Standards (presently called as Clinical Laboratory Standard Institute). (DLPTC. 2006).

Antimicrobial agents (disks) tested and reported were obtained from Hi-Media labs, Mumbai, India.

E. coli ATCC 25922, S. aureus ATCC 29213, P. areuginosa ATCC 27853, E. faecalis ATCC 29212, were used as quality control strains. Interpretative criteria for each antimicrobial tested were those recommended by the NCCLS-2000 (NCCLS 2002).

RESULTS

Present study includes 1665 specimens of urine collected from indoor patients. More than one fourth (35.25%) male and near about two third (47.45%) female had positive test result. Overall positivity was 41.74%.

Table 1: Sex wise Distribution of the Cases according to their test results (n=695)

Sex	Total Cases	Positive Cases (%)
Male	803	210 (26.25)
Female	862	485 (56.26)
Total	**1665**	**695 (41.74)**

Table 2: Organisms wise distribution of Positive cases (n=695)

Type of Organisms	Positive Cases(%)
E.Coli	340(49%)
Klebsiella	90(12.92%)
Pseudomonas	80(11.5%)
Proteus Vulgaris	20(2.8%)
Proteus Mirabilis	13(1.8%)
Others (S.saprophyticus, S.aureus)	152(21.8%)
Total	**695 (100)**

More than half (49%) cases reported as E.coli followed by Klebsiella (12.92%), Pseudomonas (11.85%), others (21.8%), Proteus (2.8%) and Proteus Vulgaris (1.8%).

Table 3: Incidence of Drug Sensitivity in Isolated Organisms from Urine Culture

Name of Drugs	*E.Coli n=340(%)*	*Klebsiella n=90 (%)*	*Pseudomonas n = 108 (%)*	*Proteus SPP. n = 32 (%)*	*Others (Gram+ve) n= 152(%)*
Ampicillin	72	61	70	60	77
Cefuroxime	76	78	70	74	---
Ofloxacin	98	96	94	98	90
Leofloxacin	96	96	95	98	95
Linozolid	68	62	60	72	98
Meropenum	90	100	98	100	----
Nalidixixc acid	36	43	43	65	58
Nitrofurantoin	80	57	76	35	7.4
Norfloxacin	52	63	64	70	82
Tobramycin	45	48	88	72	79
Cefazolin	78	59	72	70	---
Erythromycin	---	---	---	---	97
Ampicillin Sulbactum	72	72	74	72	85

Incidence of drug sensitivity among the positive cases like highest sensitivity of E. Coli with Ofloxacin (98%), Klebsiella with Meropenum (100%), Pseudomonas with Meropenum (98%), Proteus with Meropenum (100%) and Gram Positive with Linozolid (98%).

DISCUSSION

The prevalence of UTI in the population was 41.74%. This figure is higher than prevalence rate of 31.35% significant bacteriuria recorded by Savita *et al.* 2007). It is lower than prevalence rate of 66.78% recorded by Mahesh *et al*., (2010). The high prevalence may be due to genuine population susceptibility because factors like sexual intercourse, peer group influence, pregnancy, low socio-economic status.

The most common organism isolated in these patients was *E. coli* (48.92%), *Klebsella* (12.92%) *P. aeruginosa* (11.5%), *P. mirabilis* (1.8%), and *S. aureus* (21.8%). These findings pattern were similar with study of Savita *et al.* (2007) like *E. coli* (48.04%), *Klebsella* (8.82%), *P. aeruginosa* (0.98%), *Proteus.sp* (4.9%), and Gram positive organism (37.26%). In study of Mahesh (2010), organisms isolated was *E. coli* (65.7%), *Klebsella* (15.9%), *P. areuginosa* (11.14%)(Mahesh, 2010). In this study, the prevalence of UTI in females is more than in males. Of the 695 isolates obtained, 485 (56.26%) were from female patients while 210(26.15%) were from males.

This is reported that UTI is more frequent in females than in males. In study of Azra *et al.,* (2007) prevalence rate in female is 70.5% and in male is 29.5% (Mahesh, 2010) and according to Kolawole *et al*., (2009) prevalence rate in female was 66.67% and in male it was 33.33% (Azra *et al.,* 2007). The most useful antibiotics in this study were fluroquinolones (Ofloxacin, leofloxacin), erythromycin, and linezolid (in gram positives) because they inhibit most commonly isolated UTI pathogens. These drugs are relatively expensive with compared to most antibiotics frequently used. Therefore, making the organisms susceptible to it. Similar to other reports, where fluroquinolones are the most effective (susceptible) is reported by Azra *et al.,* (2007). Resistance pattern of urinary isolates in tertiary Indian hospital (Mahesh, 2010) and Kolawole et al. (2009) shown against Nitrofurantoin, ampicillin and nalidixic acid which are commonly used antibiotics were poorly effective against majority of the organisms isolated in this study. This finding is similar to others studies and findings.

CONCLUSION

The results of this study and those of others may not be representative of the general population; urinary tract infections are often treated empirically and susceptibility tests are often carried out only when the patient has failed one or more courses of antibiotics. Even though the susceptibility pattern shown by this study need for in-vitro sensitivity reports before antibiotics therapy initiation, however, it should be born in mind that in-vitro antimicrobial sensitivity is only a guide.

The findings suggested the need for constant monitoring of susceptibility of specific pathogens in different populations to commonly used anti-microbial agents. These data may be used to determine trends in antimicrobial susceptibilities, to formulate local antibiotic policies, to compare local with national data and overall to assist clinicians in the rational choice of antibiotic therapy to prevent misuse, or overuse, of antibiotics. Also, the results from this study revealed that the important infecting organisms were found to be the commensals of perianal and vaginal regions. This calls for increase in personal hygiene. Finally, since the hospital environment is a sort of collection agency for many pathogenic microorganisms by virtue of the many seriously ill patients who passes through it. Therefore, it is extremely important for the hospital managements to do everything possible to minimize the spread of these organisms to other patients.

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