



TO STUDY THE PATTERN OF ANTIBIOTIC SENSITIVITY IN URINARY TRACT INFECTION AT A TERTIARY CARE CENTER

T. Ashok Kumar¹, E. Vijai sundar^{2*}, Pauline Pakiaseeli², Anbarasi², Mallika³

¹Professor & HOD, Department of Pharmacology, Kanyakumari Government Medical College, Tamilnadu, India.

²Assistant Professor, Department of Pharmacology, Kanyakumari Government Medical College, Tamilnadu, India.

³Tutor, Department of Pharmacology, Kanyakumari Government Medical College, Tamilnadu, India.

ABSTRACT

Urinary tract infection is one of the most common infections occurring in all age groups. It is more common in females than men, especially in the reproductive age group of females. The presence of bacteria in urine is called bacteriuria, which may be asymptomatic or with typical symptoms of urinary tract infection like fever, burning micturition, lower abdominal pain, etc. The most common organism causing urinary tract infection is *Escherichia coli*, *klebsiella*, *pseudomonas* and *Staphylococcus aureus*. Urinary tract infection is diagnosed by urine microscopy and by culture sensitivity. Immediately after the diagnosis of urinary tract infection with urine microscopy patient is treated with blind antibiotic therapy since for the culture sensitivity result it takes 48-72 hours. The commonly used antibiotics are showing increased incidence of resistance. So this study was planned to find out the common organisms which causes urinary tract infection and the antibiotics which shows more sensitivity as well as resistant to these organisms and helps the treating doctor in selecting the antibiotics. The study was conducted in Kanyakumari government medical college, Asaripallam, by collecting the urine culture sensitivity report for 3 months (from June 2016 to august 2016) from the department of Microbiology, Kanyakumari government medical college, Asaripallam. Out of 166 urine culture sensitivity reports analyzed the most common organisms isolated were *klebsiella* (43.98%), *Escherichia coli* (36.75%), *pseudomonas* (7.23%) and regarding the sensitivity pattern to antibiotics, most of the uropathogens are sensitive to cefuroxime sulbactam combination (98.1%), piperacillin Tazobactam (76.5%), amikacin (65.45) and they are resistant to ampicillin (92%), cefuroxime (79.4%), amoxicillin (77.8%), gentamicin (77.8%), cephalexine (74%), ciprofloxacin (73.2%), cotrimoxazole (70.1%).

Keywords: Urinary tract infection, Culture sensitivity, Antibiotic.

INTRODUCTION

Urinary tract infection is one of the most common infections occurring in all age groups from neonates to elderly. It is more common in females than men, especially of reproductive age group females [1]. This is due to anatomical predisposition, close approximation of urethra and vagina and sexually active life during these years. 60 % women have a life time risk of developing bacterial cystitis but it is only 13% in men [2]. Normally urine in the bladder is sterile [3]. The presence of bacteria in urine is called bacteriuria, which may be asymptomatic or with typical symptoms of urinary tract infection like fever, burning micturition, lower abdominal pain, etc [4].

The most common organism causing urinary tract infection is *Escherichia coli*, *Klebsiella*, *pseudomonas*, *Staphylococcus aureus* and *Proteus mirabilis* [5]. Urinary tract infection is diagnosed by urine microscopy and by culture sensitivity. Immediately after the diagnosis of urinary tract infection with urine microscopy patient is treated with blind antibiotic therapy since the culture sensitivity result takes 48-72 hours. The commonly used antibiotics are showing increased incidence of resistance due to inappropriate selection and extensive use and this becomes a major problem worldwide in recent years.

To ensure appropriate treatment, knowledge of the organisms that cause urinary tract infection and their antibiotic susceptibility is mandatory. So this study was planned to find out the common organisms which causes urinary tract infection and the antibiotics which shows more sensitivity as well as resistant to these organisms and helps the treating doctor in proper selection the antibiotics.

MATERIALS AND METHODS

After getting the permission from the Institutional Ethical Committee, Urine culture sensitivity reports was collected from the department of microbiology, Kanyakumari Government Medical College, Asaripallam of patients who were suspected to have urinary tract infection. 166 urine culture sensitivity reports showing bacterial growth were analyzed in this study from June 2016 to August 2016. Culture sensitivity reports showing no bacterial growth and recurrent urinary tract infections were not included in the study. From these reports all the parameters including the organism, antibiotics which shows sensitive and resistant are tabulated to find out the most common organism causing urinary tract infection and the pattern of antibiotics sensitivity of these organisms.

RESULTS

In this study 166 urine culture sensitivity reports from June 2016 to august 2016 were analyzed. Out of the 166 reports, the majority of the reports are from females (61%). The most common organisms isolated were klebsiella (43.98%), Escherichia coli (36.75%), pseudomonas (7.23%), Citrobacter species (6.02%), Acinetobacter species (3.61%) Proteus species (1.2%) Enterococcus (0.6%) and Providentia species (0.6%).

Regarding the sensitivity pattern to antibiotics, most of the uropathogens are sensitive to cefuroxime sulbactam combination (98.1%), piperacillin Tazobactam (76.5%), amikacin (65.45%), Amoxicillin Clavulanic acid (35%) norfloxacin (34%), Doxycycline (33%) and they are resistant to ampicillin (92%), cefuroxime (79.4%), amoxicillin (77.8%), gentamicin (77.8%), cephalaxine (74%), ciprofloxacin (73.2%), cotrimoxazole (70.1%) (table 1). Regarding the antibiotic sensitivity and resistance pattern of isolated organism in UTI, E-coli, Klebsiella and Pseudomonas showed more sensitivity to piperacillin tazobactam, cefuroxime sulbactam, amikacin and resistance to ampicillin, cefuroxime, amoxicillin.

Table 1. Overall Percentage of uropathogens sensitivity to Antibiotics

Antibiotics	Sensitivity %	Resistance %
Amoxicillin	22.2	77.8
Ampicillin	08	92
Ciprofloxacin	26.8	73.2
Norfloxacin	34	66
Doxycycline	33	67
Cotrimoxazole	29.9	70.1
Amoxicillin Clavulanic acid	35	65
Amikacin	65.45	34.57
Gentamicin	22.2	77.8
Cefuroxime	20.2	79.4
Cephalexine	26	74
Piperacillin-Tazobactam	76.5	23.5
Cefuroxime sulbactam	98.1	1.9

DISCUSSION AND CONCLUSION

UTI is a common bacterial infection in human. In recent years the etiology of UTIs and the antimicrobial susceptibility of UTI causing bacteria's have been changing [6,7]. The treatment of choice in the treatment of urinary tract infections (UTIs) has changed from co-trimoxazole to quinolones due to increase in the rate of resistance which results in therapeutic failure [8]. A total of 166 urine culture sensitivity reports were analyzed in this study from June 2016 to August 2016. In the present study we found UTI is more common in females. In the culture positive reports, there is a significant growth of klebsiella, Escherichia coli,

pseudomonas, etc. About the antibiotic sensitivity pattern, cefuroxime sulbactam, piperacillin tazobactam, amikacin, amoxicillin, clavulanic acid, norfloxacin and doxycycline show sensitivity towards microbials. At the same time, ampicillin, amoxicillin, cefuroxime, cephalaxine, ciprofloxacin and cotrimoxazole do not show a good response against the common bacteria causing UTI. So the first line of drugs recommended in the treatment of UTI, from the study is cefuroxime sulbactam, piperacillin tazobactam, amikacin, amoxicillin clavulanic acid, norfloxacin and doxycycline.

REFERENCES

1. Kebira, Ochola, Khmadi SA. Isolation and antimicrobial susceptibility testing of *Escherchia coli* causing urinary tract infections. *J Appl Biosci*, 22, 2009, 1320-1325.
2. Nicole W, Jon DM. Deciphering Dysuria. *Emerg Med*, 40(9), 2008, 29.
3. Ramzan M, Bakhsh S, Salam A, Khan G M, Mustafa G. Risk factors in urinary tract infection. *Gomal J Med Sci*, 2, 2004, 1-4.
4. Khattak A M, Khattak S, Khan H, Ashiq B, Mohammad D, Rafiq M. Prevalence of asymptomatic bacteriuria in pregnant women. *Pak J Med Sci*, 22, 2006, 162-165.
5. Blondeau JM. Current issues in the management of urinary tract infections, extended-release ciprofloxacin as a novel treatment option. *Drugs*, 64(6), 2004, 611-28.
6. New HC. Urinary tract infections. *Am J Med*, 100 (Suppl.4A), 1996, S63-70.9.
7. Jones RN. Impact of changing pathogens and antimicrobial susceptibility pattern in treatment of serious infections in hospitalizedpatients. *Am J Med*, 100 (Suppl.6A), 1996, S3-12.
8. Yilmaz K, Nilay C, Aysegül G et al. Co-trimoxazole and quinolone resistance in *Escherichia coli* isolated from urinary tract infections over the last 10 years. *International JAntimicrbial Agents*, 26(1), 2005, 75-77.