

STUDY OF BACTERIA ISOLATED FROM URINARY TRACT INFECTION AND THEIR SENSITIVITY PATTERN

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ABSTRACT

A retrospective study was conducted among out-patient and in-patient in Kathmandu medical college Teaching hospital of one month from the duration 2060-11-15 to 2060-12 -15. Mid-stream urine [MSU] of 300 patient were cultured. Out of these, 75 patients' urine were found to have significant bacterial growth. Total of five species of bacterial species isolated were viz. E.coli 37(33.3%), Proteus species 25(27.7%), Klebsiella species 15(16.6%), Staphylococcus aureus 8(8.8%) and Pseudomonas aureginosa 1(1.1%).

Regarding their antibiotic sensitivity pattern, E. coli were sensitive to Nitrofurantoin 31 (83.8%), Norfloxacin 25 (67.5%), Ofloxacin 30(81.0%), Amoxicillin 16(43.2%), Nalidixic acid 15 (40.5%). proteus species were sensitive to Nitrofurantoin 15 (60.0%), Norfloxacin 15 (60.0%), Ofloxacin 12(48.0%), Amoxicillin 13(52.0%), Nalidixic acid 10 (40.0%), Ciprofloxacin 12(48.0%). Klebsiella species were sensitive to Nitrofurantoin 9 (60.0%), Norfloxacin 5 (33.3%), Oflaxin 6(40.0%), Amoxicillin 5(33.3%), Nalidixic acid 4 (26.6%), ciprofloxacin 6(40.0%).

Staphylococcus aureus were sensitive to Nitrofurantoin 8(100.0%), Norfloxacin 6(75.0%), Oflaxin 8(100.0%), Amoxicillin 7(87.5%), Nalidixic acid 6(75.0%), Ciprofloxacin 8(100%). And Pseudomonas aureginosa were resistant to all antibiotics which we are using in this research work.

Key Words: Urine sample, Identification, Sensitivity pattern.

INTRODUCTION

Urine is a sterile ultrafiltrate of blood. In absence of urinary tract infection (UTI), it emerges from kidney and bladder free from microbes. During passage through distal urethra, a small number of bacteria may enter the urine as contaminants. This is because normally renal tissues, bladder and proximal urethra are sterile but several species of bacteria may be found in distal urethra as transient micro flora, most of which are derived from faecal flora. Normally human urine contains 96% water, 2% urea, and the remaining 2% consist of uric acid, creatinine, ammonia, Sodium and potassium ions etc. therefore urine can prove to be an excellent medium for the growth of

microorganisms. Infection of urinary tract is the second commonest site of infection after respiratory tract infection. Urinary tract infection is defined as bacteriuria i.e. the multiplication of the organisms in the urinary tract and the presence of more than 10^5 organisms per ml. in the mid stream urine sample.

UTI is among the most common bacterial infections that lead patients to seek medical care. It has been estimated more than 6 million out patients visit and 300,000 hospital stays every year are due to UTI (Palac, 1986; Stamm, 1992; wong, 1983). Approximately 10% of humans will have a UTI at some time during their lives.

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Nepal being a developing country it has about 61.4% people illiterate who are not aware on health matters and don't have idea of hygienic living habit, so are always in the threat to infectious caused by different types of organisms. According to annual report of fiscal year (2055/2056) published Department of Health Services, 0.46% 91,02,633) of total Out patient department visited (69,83,297) in whole population (2,22,87,413) was suffered from UTI (DoHS 2000)

UTI is more common in women than in men at least partially because of the short female urethra and its proximity to anus. The incidence of infection is highest in women, 20-50% of whom will suffer a clinical episode during their lifetime (Leigh 1996). The average prevalence of asymptomatic bacteriuria is 6% during pregnancy due to anatomical and physiological changes such as changes in hormonal level. It is an important risk factor for acute pyelonephritis, hypertension, low birth weigh, prematurity etc.(Abyad 1991).

E.coli are present on between 80 and 90% of UTI (Delzell & Lefevre, 2000) and up to 95% of acute pylonephritis other isolated gram-negative rods are proteus mirabilis, Klebsiella pneumoniae. Within the Gram positive organisms streptococcus agalacticus coagulase negative staphylococcus are found (Conolly & Thorp,1999).

A study was carried out at maternity hospital, Thapathali, Kathmandu, with the aims to screen out causative agents of bacteriuria and to determine antibiotic sensitivity profile of the urine isolates in different groups of Nepalese women (pregnant and non pregnant). Among these samples from pregnant women showed 15.95% significant growth of different bacteria i.e. E.coli, Klebsiella spp, Proteus spp. where as among non pregnant shows only 5% (Ghimire 1995).The bacteria isolate from clinical cases in TUTH, 38.3% shows significant bacterial growth, 27% showed mixed positive growth and 34% have negative growth. In these study 86% organism were gram negative bacteria, E.coli was the most common isolates i.e. 53.3% followed by Klebsiella spp, Citrobacter spp, Proteus spp, etc.(Manandhar 1996). Bacteria

isolated and their sensitivity pattern were studied in TUTH & Nitrofurantoin was found to be the most effective drug (84.21%) followed by Norfloxacin (42.11%), Clotrimazole (36.84%), Nalixidic acid (28.94%) and Ampicillin (10.52%) (Dhakal 2002).

Nepal is developing country. Most of the people are illiterate & do not know antibiotics and its mechanism against bacteria and resistant developing mechanisms. So, they are not aware of effect of irrational use of drugs, wrong dose and dose taken insufficient length of time. Drug resistance microorganisms are increasingly important public health concern. The resistance antimicrobial agents have been still on treat infectious disease caused by resistant pathogens of generic origin and transferable bacterial species and genera.

MATERIAL AND METHODS

The total 300 mid-stream urine sample was collected in Kathmandu Medical College, Kathmandu. This sample were cultured in Blood agar and MacConkey agar plate and incubated for 24hrs at 37°C. The isolated bacteria were identified by using different biochemical media and perform antibiotic sensitivity pattern on Muller Hinton agar media using different bacterial culture and antibiotic disc.

RESULT

Total 300 Urine sample were collected, out of these 75 patients' urine were found to have significant bacterial growth. Total five species of bacterial species were isolated viz .E.coli 37(33.3%), Proteus species 25(27.7%), Klebsiella species 15(16.6%), Staphylococcus aureus 8(8.8%) and Pseudomonas aureginosa 1(1.1%).

And sensitivity pattern E. coli were sensitive to Nitrofurantoin 31 (83.8%), Norfloxacin 25 (67.5%), Ofloxacin 30(81.0%), Amoxycillin 16(43.2%), Nalidixic acid 15 (40.5%). proteus species were sensitive to Nitrofurantoin 15 (60.0%), Norfloxacin 15 (60.0%), Oflaxin 12(48.0%), Amoxycillin

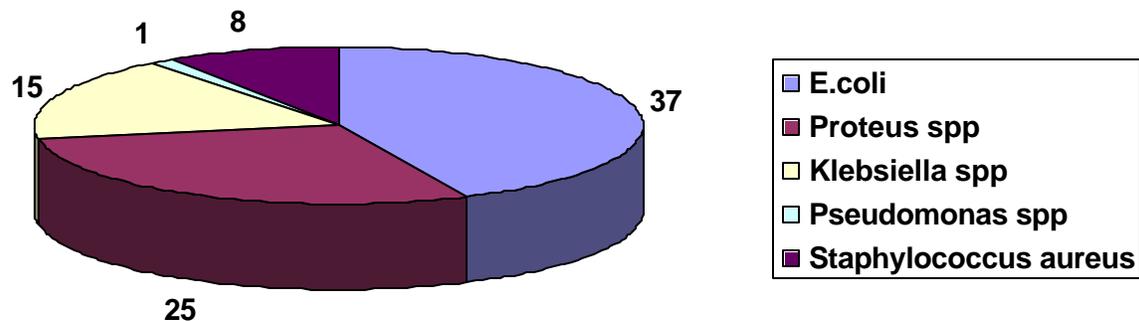


Fig. 1 : Total number of bacteria isolates UTI.

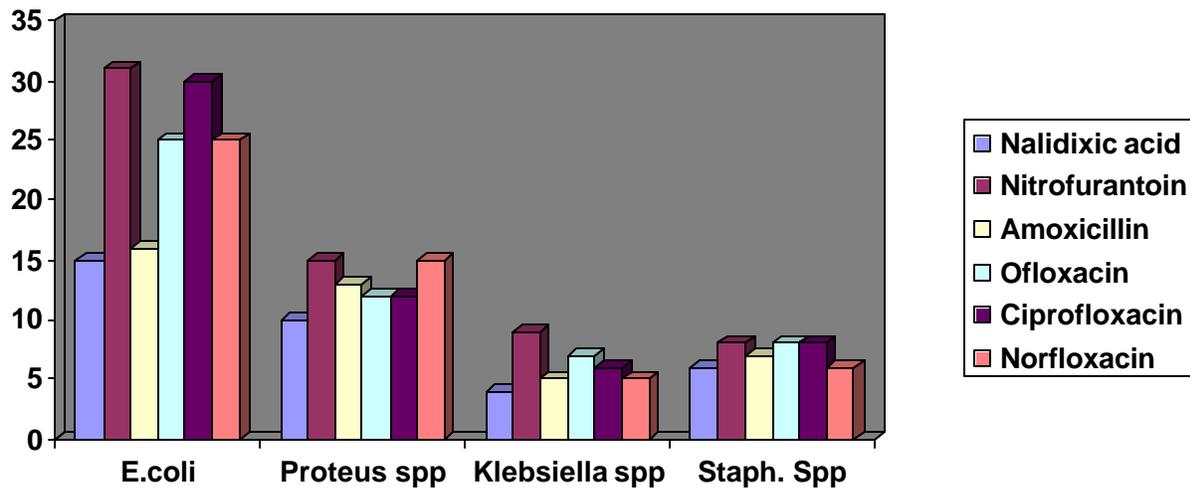


Fig. 2 : Antibiotic sensitivity pattern of isolated bacteria.

13(52.0%), Nalidixic acid 10 (40.0%), Ciprofloxacin 12(48.0%). Klebsiella species were sensitive to Nitrofurantoin 9 (60.0%), Norfloxacin 5 (33.3%), Ofloxacin 6(40.0%), Amoxicillin 5(33.3%), Nalidixic acid 4 (26.6%), Ciprofloxacin 6(40.0%).

Staphylococcus aureus were sensitive to Nitrofurantoin 8(100.0%), Norfloxacin 6(75.0%), Ofloxacin 8(100.0%), Amoxicillin 7(87.5%), Nalidixic acid 6(75.0%), Ciprofloxacin 8(100%). And Pseudomonas aureginosa were resistant to all antibiotics which we are using in this research work.

DISCUSSION

In this study UTI among the out patients and in patients in Kathmandu medical college. The study basically focused on Culture significant positive sample. Bacteria isolates from examined urine samples were subjected to antibiotic sensitivity testing. Total 5 genera were isolated from 300 urine samples and 75 sample shows significant bacteriuria. The bacterial organisms' cause UTI is more common in Gram negative bacteria than Gram positive bacteria. In this study, 82(91.1%) Gram negative bacteria were isolated (fig 1)i.e, E.coli, Proteus spp, Klebsiella spp, Pseudomonas spp which was higher than Gram positive bacteria 8(8.8%) i.e., Staphylococcus aureus. E.coli accounts of 80-90% infection (Foxaman et al 2000) In the present study 33.3% found which is still the dominant bacteria responsible to cause UTI than followed by Proteus species 25(27.7%),Klebsiella species 15(16.6%),Staphylococcus aureus 8(8.8%) and Pseudomonas aureginosa 1(1.1%).

The infectious organisms are most commonly derived from patient's own faecal flora. This statement is related to the finding because some of these isolates to normal flora, i.e,

E.coli, Enterobacter spp, Klebsiella spp, Proteus spp.

In the present study Staphylococcus aureus was found 8.8% of total isolates that is often indicated pyelonephritis acquired by hemogenous route. So pure culture of S.aureus is considered to significant regardless of no.c.f.u. (Baron et al 1990).

Symptoms that indicate a lower UTI are increased frequency micturation, dysurea, and urgency. Similar symptoms that indicate an upper UTI are high temperature, dysurea and nausea (Car & Shikh, 2003). In our study, the purpose of antibiotic susceptibility testing for UTI is provide in vitro information to assist clinician in selecting an antimicrobial effectively in inhibiting the growth of infecting organisms in urine genitourinary tract (Lorian, 1990).

In the present study (fig.2) Nitrofurantoin was found to be most effective drugs i.e., E.coli 83.8%, proteus species 60.0%, Klebsiella species 60.0%, Staphylococcus aureus 100.0%.

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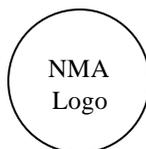
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