

Study of bacteria isolated from urinary tract infections of patient attending Tikrit Teaching Hospital for the year 2014 and its sensitivity to commonly used antibiotics

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Abstract

Urinary tract infection(UTI) is consider as a common infection and in spite of the availability of antibiotics, UTI has become difficult to treat because of the increasing resistance of pathogenic bacteria to antibiotics .This research was done to detect the uropathogens of urinary tract in individuals attending Tikrit Teaching Hospital (T.T.H.) .complaining from UTI.The present study was carried out from November 2013to February 2014 and 63 urine samples were examined 29 were from males and 34 from females, from those 81% has a positive culture, while 19% was negative. Also, the current study appeared that females were more frequently effected than males, and the most common isolated bacteria was *Pseudomonas aeruginosa*, while the less isolated one was the *Enterococcus*. Using 10 tested antibiotics, the best acting antibiotic was the Amikacin, while the less effective antibiotic was the Ampicillin.

Introduction

Urinary tract infection is considered as the second common infection in the community clinic in the world. About 150 million people are infected with Urinary tract infection each year, and Urinary tract infection can be uncomplicated or complicated (1). Urinary tract infection may affect both the upper and the lower tract. Cystitis is a term used to clarify the syndrome involving dysuria, suprapubic tenderness (2). The following bacteria are detected from inpatients, *Klebsiella*, *Staphylococci*, *Enterococci*, *Proteus*, *pseudomonas*, and *Enterococci* species while *E. coli* is more frequently detected in outpatients population (3). Among nosocomial pathogenic bacteria *Corynebacterium urealyticum* has been recognized (4). Anaerobic pathogens are rarely isolated urinary tract infection (5). *Staphylococcus saprophyticus*; are a common causative agent of UTI in some studies (5) and it is isolated from young women, it tends to infect of sexually active age (6).

Treatment of UTI is depend on information obtained from the antibiotics resistance profile of the uropathogens, which is often started therapy and empirically (7). Antibiotic resistance could be comes via natural selection acting on random mutation,

but it can also be obtained by applying an evolutionary stressor population (8). The increase of antibiotic resistance is due to the wide use of antibiotics in practice (9). The distribution of bacteria isolated from UTI and their susceptibility to antibiotics varies from area to another so it becomes important to have information about distribution of the pathogens and their antibiotics susceptibility in a particular setting (10).

The aim

of the study was to determine aerobic bacteria responsible for urinary tract infection in patient attending outpatient T.T.H and to determine in vitro its *susceptibility* to the most common used antibiotics.

Materials and methods

❖ Specimens

This study was carried out in microbiology section in T.T.H. during the period November 2013 to February 2014. Sixty three urine samples were taken from patients attending outpatient clinic complaining from UTI. Their age between 15 and 50 years; 29 were males and 34 were females.

❖ Laboratory methods

-Culture of the specimens

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Different culture media were prepared according to the manufactures instruction, and used for isolation and identification of bacteria from urine samples, those media were blood agar, MacConkey agar, nutrient agar, and brain-heart-infusion agar(11). Mueller- Hinton medium media used for antibiotic sensitivity test of isolated bacteria by using of the Kirby Bauer method (1996) according to the National Committee of Clinical Laboratory Standard (NCCLS) (11).Ten types of antibiotics were used to carry out the sensitivity of isolated bacteria to antibiotics, and the zone of inhibition was estimated and

compared to the standard one of each antibiotic. The zone of swarming for motile organism.(*proteus*) was ignored . (11)

❖ Biostatistical Analysis

Statistical package for social (SPSS) version 12 and Microsoft office Excel 2007 is used for the analysis the results of the current study .

Results

Frequency of UTI among male and female.From the 63 samples that are taken, 29 was a male while 34 was female, so the frequency of UTI in male was 46% while in female was 54% as shown in figure (1).

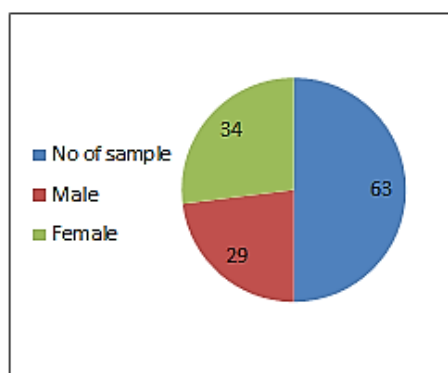


Fig (1) frequency of UTI among male and female

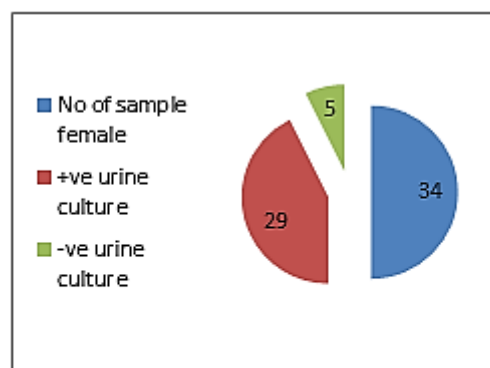


Fig (2) frequency of positive culture female.

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Urine culture was carried for all the 63 patients , from those 22 male (70.59%) had a positive urine culture and 29 female (80.50%) had a positive urine culture, so the positive culture was more in female than in male as shown in figure(2 and 3).The types of isolated

bacteria *Pseudomonas aeruginosa* show the highest percentage reach to 19 isolates, *Staphylococcus aureus* reach to 8 cases, *Proteus* species 6 cases, *E. coli* 5 cases while the least one was the *Staphylococcus epidermidis* (3 cases) as shown in table (1).

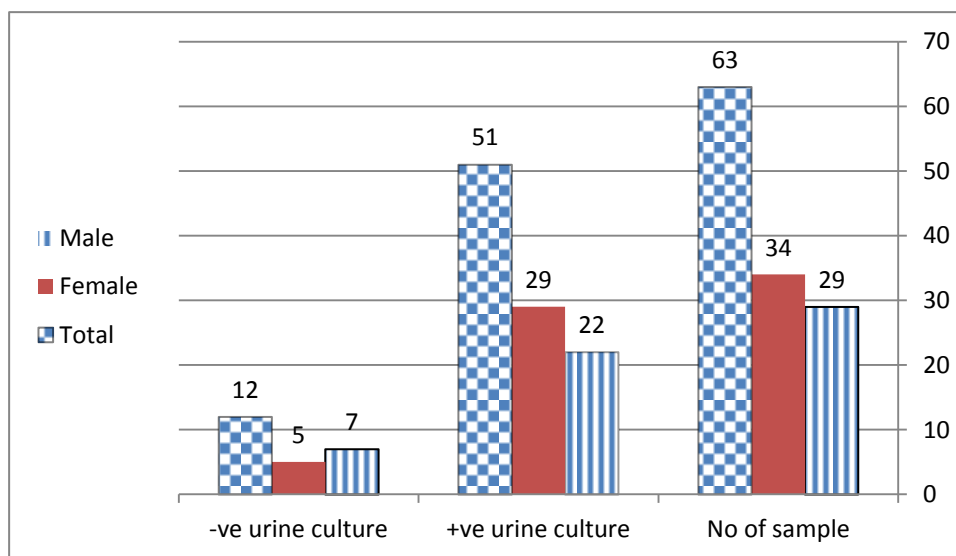


Fig (3): Frequency of positive culture among male and female

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Table (1): Frequency of isolated bacteria .

Type of bacteria		No. of +ve culture	Percentage %
<i>Pseudomonas aeruginosa</i>		19	37.3
<i>Staphylococcus aureus</i>		8	15.7
<i>Proteus vulgaris</i>	4	7.8	
<i>Proteus morabilus</i>	2	3.9	
<i>E.coli</i>	5	9.8	
<i>Enterobacter</i>	3	5.9	
<i>Klebseillae.pneumoniae</i>	2	3.9	
<i>Enterococcus</i>	1	2.0	
<i>Streptococcus pyogenes</i>	4	7.8	
<i>Staphylococcus epidermis</i>	3	5.9	
Total		51	100

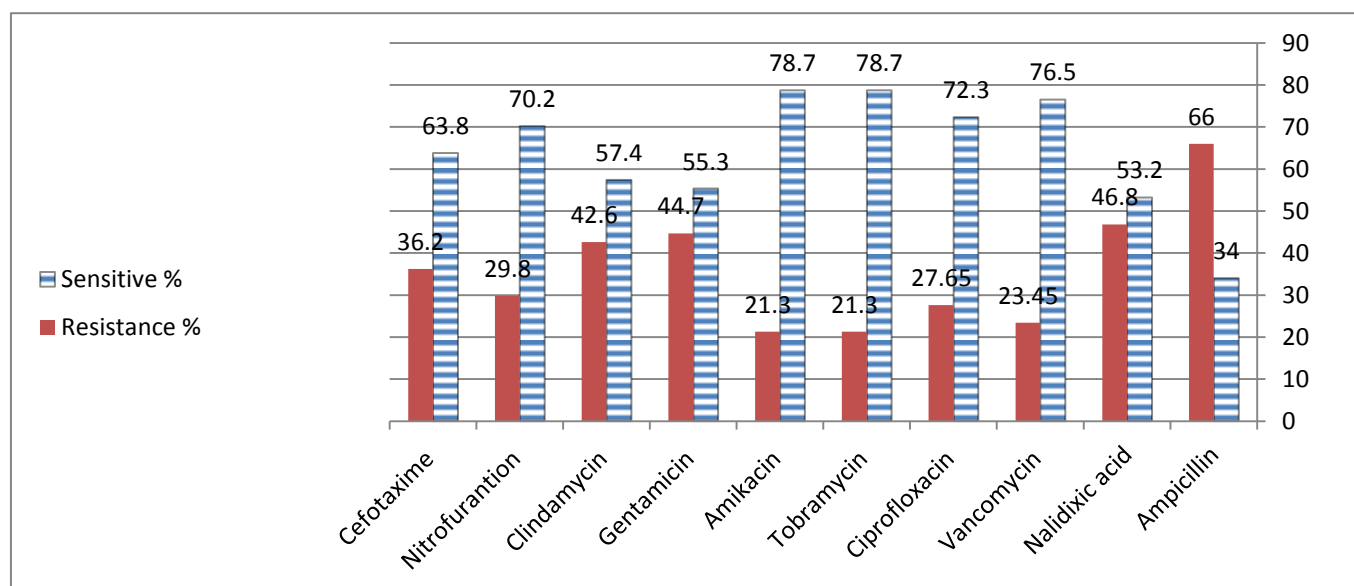


Figure (4) Antimicrobial sensitivity testing

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The antibacterial susceptibility test was done by using disc diffusion method for whole the isolated bacteria to the common antibiotics that used in the treatment of UTI. The isolated bacteria were highly sensitive to amikacin(78%), vancomycin(76.5%), Nitrofurantion (70.2%), Cefotaxime(63.8 %),and the less working antibiotic was the Ampicillin(34%) and Nalidixic acid (53.2%).as shown in figure (4).

Discussion

Urine culture was done for all of the 63 samples of urine,80% was positive for urine culture and 20% was negative and this was similar to those reported by Kalawale(12) and Al-Jebori and Hasen (13), and different from those reported by Alkanerurker *et al* (15) and Mansour .(16).

The most isolated pathogen was *Pseudomonas aeruginosa*, and this result differs from the results of Al-Jebouri (14) who found that *E.coli* was the most commonly isolated bacteria, and also differs from the results obtained by Alkanerurskar *et al*(15), while Mansour. (16) results showed a high prevalence of *Pseudomonas* (reach to 40%).The

uropathogen obtained in this research are in agreement with other studies carried out in different regions locally or globally (17), The difference in the species and distribution of isolated bacteria may result from differences in environment , healthcare, socioeconomic status and hygiene measurement in different countries.

The prevalence of Gram positive bacteria was not high in when compared with prevalence of Gram negative bacilli, and this is similar to some of other studies in variable regions (18), The microorganisms belong to Enterobacteriaceae family were the most common bacteria isolated from UTI in current study . *E.coli* was the most predominant bacteria and this is agreement with other studies findings(19). In the present study a most of bacterial isolates was resistance to Clindamycin, Gentamicin, Cefotaxime and Ampicillin and this is going with previous studies in USA. (20), India (21), and Iraq (14)The high prevalence of resistance to common antibiotics used in the treatment of UTI such as cephotaxime, Ampicillin, Gentamicin has pointed to a real problem (22), the most effective antibiotics in this study as other studies also mentioned. (22,14,15)

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Conclusion

From the current study we can conclude that the most commonly isolated bacteria was *Pseudomonas aeruginosa* and the most effective antibiotic was Amikacin, while ampicillin was the less effective one. Also from this study we can conclude that UTI was more frequently effective in female than male, and most of the positive culture related also to the female.

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