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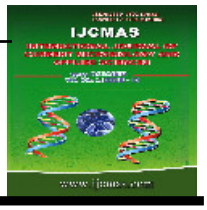

Original Research Article

Urinary Tract Infection of adults in Baghdad City

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A B S T R A C T

Urinary tract infections (UTIs) have become the most common of community-acquired and nosocomial infections in persons of all ages.Two hundered eighty urine samples were collected from out- patients department with clinical symptoms of UTI referred to AL-Karama teaching hospital, Baghdad during the period from 1/3/2009 to 1/7/2009. 187(66.8%) females and 93(33.2%) males, with an age range 0f 10 - 60 years. Clean- catch midstream urine samples were collected and cultured for isolation of pathogens causing UTI. The isolated pathogens were identified by using biochemical tests and Disk diffusion method was used to determine susceptibility of antibiotic agents. From 162 samples with positive culture there were 126 (77.7%) females and 36 (22.3%) males with significant ($p \leq 0.05$) gender difference. The most common isolated pathogens of Gram-negative pathogens was *Klebsiella spp* (30.8%) followed by *E.coli* (22.2%) and the Gram-positive pathogens was *Staphylococcus aureus* (27.2%). The Gram-negative pathogens were showed high susceptibility to imipenem, amikacin, ciprpfloxacin, gentamicin, ceftraxione and cefotaxime . The Gram-positive pathogens were showed susceptibility to imipenem , amikacin, nitrofurantion, ceftraxione, ciprofloxacin, co-trimaxazole and gentamicin.

Keywords

Urinary Tract Infection (UTI) *Staphylococcus aureus; E.Coli;* Antimicrobial susceptibility; Baghdad.

Introduction

Urinary tract infections (UTIs) have become the most common of community-acquired and nosocomial infection in persons of all ages (Robert et al., 1990; Foxman, 2002). About 150 million people (worldwide) are diagnosed with urinary tract infection each year(Stamm and Norrby, 2001).Women tend to get infections more often because their urethra is shorter and closer to the anus then men, or after sexual activity and when using a diaphragm for birth control. In addition menopause increase the risk of a UTI which all above called uncomplicated UTIs (normal urinary tracts) (Lin and Fajardo, 2008; Foxman, 2002). On the other hand UTIs which are needed prolong treatment , conditions with abnormalities of urinary tract that impede urine flow (catheter, stone) or infection with multi-

drug resistant pathogens called complicated UTIs . UTIs in men patients are considered complicated (Stapleton, 2008). Nearly 95% of UTIs are caused by bacteria that typically multiply at the opening of the urethra and travel up to the bladder. Much less often, bacteria spread to the kidney from the blood stream (Ronald, 2002).

The aim of this study was to isolate pathogenic agents causing UTI and to determine their antibiotics susceptibility pattern in the outpatients referred to AL-Karama teaching hospital, Baghdad, Iraq .

Materials and Methods

Two hundred eighty urine samples were collected from outpatient department with clinical symptoms of UTIs referred to AL-Karama teaching hospital, Baghdad during the period from 1/3/2009 to 1/7/2009. There were 187(66.8%) females and 93(33.2%) males, with an age range of 10 60 years.

Good advices about guidelines for proper specimens collection were given. Urine samples were collected in a sterile ,wide mouth leak proof container(5ml). Clean-catch midstream urine of the patients was collected and bring to the laboratory as early as possible (Forbes *et al.*, 2007).

All urine specimens were cultured directly on blood agar and MacConkey agar plates (Mast Group Ltd. Merseyside, UK) for isolation of bacteria. The cultured plates were examined after overnight incubation at 37˚C (Collee *et al.*, 1996) and were confirmed by oxidase test, catalase test, motility test and other biochemical test (Colle *et al.*, 1996).

Urine samples were mixed well by centrifuge and examined under microscope for wet mount preparation (urinalysis) followed by a Gram's stain. Antibiotics sensitivity was carried out by using Muller-Hinton media (Ibn-Albetar Research center, Baghdad- Iraq).

Colonies of isolated bacteria were picked up with sterile loop and suspended in to 2.5 ml of sterile distilled water, the suspension was taken by sterile swabs then streaked the surface of the plates. The antibiotics disks were placed on the inoculated plates with the help of sterile pair of forceps. The plates were incubated at 35-37c˚for 24 hrs (Partick and Murray, 1995). After incubation, the diameters of clear zones around the antibiotics disks were measured to the nearest millimeter (NCCLS, 1998).

The antibiotics tested were ciprofloxacin (5µg), amikacin (30µg), nitrofurantion (300µg), co-trimaxazole (25µg), gentamicin (10µg), ampicillin (10µg), nalidixic acid (30µg), cephalothin (30µg), tetracycline (30µg), imipenem (10µg), ceftriaxone (30µg), and cefotaxime (10µg) (NCCLS, 1998) .

Result and Discussion

In this study, out of 280 patient's samples; 162 (57.9%) were showed to be urine culture positive and 110 (39.3%) were showed to be no growth of pathogens while 8 (2.8%) were showed contaminated urine culture. The distribution of isolated pathogens and their relation to sex was shown in table (1). There were 126 (77.7%) females and 36 (22.3%) males with a significant ($p \leq 0.05$) gender difference.

Table.1 Distribution of 162 patients according to age and sex .

Age groups (years)	Females		Males	
	No.	%	No.	%
10-19	5	3.1	3	1.9
20-29	30	18.5	10	6.2
30-39	25	15.4	8	4.9
40-49	22	13.6	9	5.6
50-59	20	12.3	4	2.5
60	24	14.8	2	1.2
Total	126	77.7	36	22.3

Figure.1 Distribution of the organisms isolated from urine samples

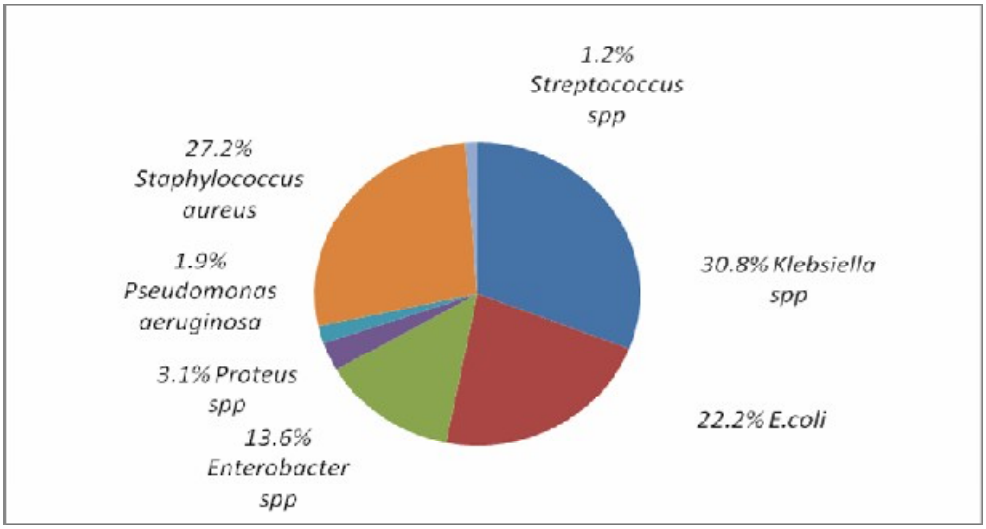

Table.2 Distribution of antibiotic susceptibility among the bacterial isolates

Staphylococcus aureus	*Pseudomonas aeruginosa*	*Proteus spp*	*Enterobacter spp*	*E.coli*	*Klebsiella spp*	Organisms isolate
N= 44	N= 3	N= 5	N= 22	N= 36	N= 50	Antibiotics
72.7	33.3	40	68.2	77.8	86	ciprofloxacin
84.1	33.3	60	72.7	88.9	88	amikacin
79.5	----------	40	54.5	44.4	50	nitrofurantion
70.5	----------	40	36.4	36.1	38	Co-trimaxazole
52.3	66.7	20	77.3	80.6	80	gentamicin
11.4	----------	---------	31.8	13.8	----------	ampicillin
50	----------	80	63.6	76	68	Naldixic acid
18.2	----------	20	27.3	13.9	14	cephalothin
15.9	----------	---------	----------	---------	----------	tetracycline
100	100	100	100	100	100	imipenem
77.3	----------	80	72.7	94.4	78	ceftraxione
50	----------	60	68.2	88.9	76	cefotaxime

The most common isolated pathogens in Gram-negative pathogens *were Klebsiella* spp (30.8%) and Gram-positive pathogens was *Staphylococcus aureus* (27.2%). The other pathogens were E.coli (22.2%), *Enterobacter* spp (13.6%), *Proteus spp*(3.1%), *Pseudomonas aeruginosa* (1.9%), and *Streptococcus* spp (1.2%) (Gram-positive pathogens: 28.4%; Gram – negative pathogens 71.6%) (Fig.1). The isolated pathogens were showed differences in their susceptibility to the antibiotics used in this study (table. 2)

All the pathogens were sensitive to imipenem. The highest susceptibility for the Gram-negative pathogens were shown by amikacin, ciprofloxacin, gentamicin, ceftraxione and cefotaxime. *Klebsiella spp* was the commonest isolate which gave high susceptibility to imipenem (100%), amikacin(88%),ciprofloxacin(86%),ceftra xione (78%) and cefotaxine(76%) with resistant (1oo%) to ampicillin and tetracycine. *E.coli* the second isolated pathogens of Gram-negative was showed susceptibility to imipenem(100%), ceftraxione(94,4%), amikacin, cefotaxime (88.9%),ciprofloxacin (77.8%) and naldixic acid(76%). *Staphylococcus aureus* was showed susceptibility to imipenem (100%), amikacin (84.1%), nitrofurantion(79.5%),ceftraxione(77.3%), ciprofloxacin (72.7%) co-trimaxazole (70.5%) and gentamicin(52.3%),naldixic acid , cefotaxime (50%) respectively with low sensitivity to ampicillin (15.9%) and cephalothin(8.2%).

Urinary tract infections are the most common cause of infectious disease produced by a variety of enteropathogenic bacteria (Morrison. and Wenzel, 1986; Nicolle, 2001).

Table (1) the sex distribution in this study showing a statistically predominance of females with urinary tract infection (77.7%) of the positive culture which deal with similar reported by Abu Shaqra (2000). There was an elevation in the incidence of infection among females because they tend to get infections more than males due to the differences between the male and female genitourinary system in anatomy (Gorbach *et al.,* 2004). There were high differences between the distribution of pathogens which causes urinary tract infection in this study; Gram-positive (28.4%) and Gram-negative (71.6%), this result was similar to many studies in the world, may be due to the different environmental conditions and the other factors; healthcare, hygiene methods, education programs etc., (Astal and Sharif, 2002). This study was showed that *Klebsiella* spp. to be the commonest pathogens (30.8%) among the Gram-negative bacteria and *Staphylococcus aureus* (27.2%) among the Gram-positive bacteria. This result was similar to other studies; Gupta *et al*., (2002) and Orret *et al.*, (2006). The isolated pathogens were sensitive to imipenem, this result was similar to Alhambra *et al.* (2004), but that study found; imipenem had a more limited activity against *Pseudomonas aeruginosa* .

Most of the isolated pathogens of Gram-negative were resistant to ampicillin and cephalothin with (100%) resistance to tetracycline, this result was similar to the study reported by Sahm *et al.,* (2001) and Orret *et al*., (2006). *E. coli*, the second isolated pathogens of Gram-negative ; a high level of bacterial resistance was seen to ampicillin and cephlothin , this result was similar to the study by Sahm *et al*., (2001) . On the other hand these bacteria were showed a high sensitivity to ceftraxione, amikacin, cefotaxime, gentamicin, ciprofloxacin and naldixic

acid. This study was similar to the study by Mansour *et al*., (2009). *Saphylococcus auerus* was the commonest isolate of Gram-positive in this study which showed high sensitivity to the antibiotics: amikacin, nitrofurantion , ceftraxione , ciprofloxacin and co-trimaxazole. This result was similar to the study reported by Mansour *et al*., (2009).

It is concluded that Gram-negative and positive pathogens were responsible for urinary tract infection . The most common isolated pathogens of Gram-negative was *Klebsiella* spp. and the most effective antimicrobial agents were imipenem, amikacin, ciprofloxacin, gentamicin, ceftraxione and cefotaxime . Also the most common isolated pathogens of Gram positive was *Staphylococcus aureus* and the most effective antibiotics against them were imipenem, amikacin, nitrofurantion, ceftraxione, ciprofloxacin and co-trimaxazole.

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