Detection of Uropathogens in Urinary Tract Infection and Their Sensitivity to Many Antimicrobial Agents

Mohamed R. Ali
Foundation of Technical Education / Medical Technical Institute/Almansur

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Abstract

Urinary tract infections (UTI) are some of the most common infections experienced by humans, exceeded in frequency among ambulatory patient only by respiratory and gastrointestinal infections. It is also the most common cause of nosocomial infection in adults. A total of three hundred urine sample were collected in age (1-69 years old) in both gender, with (UTI) symptoms referred to AL-Yarmok Teaching Hospital at Baghdad city during the period from January 2010 till August 2010. .

The commonest isolates were *Escherichia coli (E.Coli), Proteus mirabilis* and *Klebsiella pneumoniae* (These represented 49.2%, 22 %, and16 % of isolates respectively). The percentage of bacteria incidence in females was higher than male in most of examined samples, except in *Klebsiella*; it was higher in males .The most positive case was in elder patients than in children. The infection incidences expressed higher level in summer. It reached to peak from August with percentage of (32 %) and July (24.4 %). The antibiotic sensitivityforstreptomycin,lincomycin,Rifampicin,Chloramphenicol, Tetracyclin,Ampicillin, Penicillin , Co-trimoxazole, Amoxicillin, Nalidixic acid and Gentamycin was examined , detected species of bacteria were more sensitive to Chloramphenicol(75.6) and streptomycin (81.4), while the resistances to Tetracycline (100% and Penicillin(100%) were appeared to *Escherichia coli.*

Key word : Urinary tract infection, antimicrobial resistance

Introduction

Urinary Tract Infection (UTI) is a serious bacterial infection causing illness in infants and children. Urinary tract infection is applied to a variety of clinical condition ranging from asymptomatic presence of bacteria in the urine to severe infection of the kidney with resultant sepsis [1]. Urine infection is the most common serious bacterial infection causing illness in infants and children [2].It is one of the most common bacterial infections encountered by clinicians in developing countries [3]. Various factors make bacteriuria more or less to occur for any individual. These factors are age, gender, race, genetic factors, sexual activity among the teen age girls, and circumcision in boys, nocturnal enuresis and some unhealthy behaviors. UTI is age dependent and bacteriuria is more common at the extremes of life .The Incidence of UTI is bimodal highest during the first year of life and be taking again during adolescence [4]. Most of urinary tract infections are caused by gram-negative bacteria lik*e, E.Coli , Klebsiella species, Proteus mirabilis*, *Pseudomonas aeruginosa*, *Acinetobacter*, and *Serratia*. 90% of UTI cases are caused by gram-negative bacteria while only 10% of the cases are caused by gram positive bacteria. Gram-positive bacteria while only 10% of the cases are caused by gram positive bacteria. Gram- positive bacteria include *Enterococcus, Staphylococcus,* and *Streptococcus agalactiae* [5]. *E. Coli* are the most common gram – negative bacteria responsible for UTI [6], 75% to 87% of UTI cases are due to *Escherichia coli* [7, 8]. At least 80% of the uncomplicated cystitis and pyelonephritis are due to *Escherichia* coli [1].Whereas *Proteus mirabilis* and *Klebsiella pneumonia*e infection accounts 10%, 6% respectively [9,10,11]. Adherence properties of some organisms prevent the normal was hot for of these organisms by bladder emptying and mucosal host defense mechanisms. *Escherichia coli* are virulent due to the presence of p.fimbriae, ganelles on its strains that may attach or adhere on specific receptors of uroepithelial cells and interfere with the washout of bacteria [1]. *Escherichia coli* are predominant in girls, whereas *Proteus mirabilis* and *Klebsiella pneumonia* are likely encountered in boys [9]. Treatment of UTI with the appropriate antibiotic can minimize mortality, morbidity and any renal damage from acute UTI. Choosing the appropriate antimicrobial agents sounds difficult , but advances in the understanding of the pathogenesis of UTI , the development of new diagnostic tests , and the introduction of new antimicrobial agents have allowed physicians to appropriately tailor specific treatment for each patient Sulphamethoxazole, Trimethoprime, Fluroquinolones (e.g. Ciprofloxacin), Nitrofurantoin, amino glycosides (e.g. Gentamicin, Amikacin), cephalosporin and aminopenicllins (e.g. Ampicilline and Amoxicillin). Trimethoprime, Sulphamethoxazole, Cephalosporin and Amoxicillin –clavulanate are considered to be the most acceptable antibiotics for the treatment of UTI in pediatrics in comparison to quinolones, which has an effect on joint development, and first line therapy of amoxicillin which has a high prevalence of resistance to *Escherichia coli* in many communities [4]. Urinary tract infections are second most common type of infection in the body, accounting for a bout 8.1 million visit to health care providers each year [14].Women are especially prone of UTIs for antibacterial resons .UTI in men are not common as in women but can be serious when they occur. Many women suffer from frequent UTIs .About 20 percent of young women with a first UTI will have a recurrent infection [15]. Men are less likely than women to have a first UTI. But once a man has a UTI, he is likely to have another because bacteria can hide deep inside prostate tissue .Women are more prone to UTIs than men because in female the urethra is much shorter and closer to the anus [16].As a woman's estrogen level decreases with menopause, her risk of UTIs increases due to the loss of protective vaginal flora [17].UTIs are the most frequent bacteria in women [18]. They occur most frequently between the age of 16and 35 years, with 10 % of woman getting an infection. High incidence of UTI due to *Proteus spp*., *Klebsiella spp*. And *Enterobacter spp*. Infection is more common among Children with recurrent UTIs and in those treated with antibiotic prophylaxis. Whereas other Uropathogens like *Pseudomonas, Serratia* and *Candida* are more common among children with urogenital

abnormalities [12]. 87% of Community –acquired UTI is due to *Escherichia coli* and 12% by *Klebsiella;* whereas in hospital acquired UTI 65% are caused by *Escherichia coli* and other pathogens, including *Pseudomonas* [13]. It is very important to recognize and treat UTI rapidly yearly and 60 % having an infection at some point in their lives [19]. The incidence of true UTI in adult male younger than 50 years is low (approximately 5-8 per year per 10,000), with adult woman being 30 times more likely than men to develop a UTI. The incidence of UTI in men approaches that of woman only in men older than 60 years [20]. The aims of this study are detection of bacteria that causes urinary tract infection in some Iraqi patients and determine the sensitivity to many antibiotics .

Materials & Methods

Three hundred urine samples were collected from patients in age(1-69 years old) in both gender , with UTI symptoms referred to AL-Yarmok Teaching Hospital at Baghdad city; were studied during the period from January/ 2010August /2010. Isolation of Uropathogens was performed by a surface streak procedure on both blood and MacConkey agar (Oxoid Ltd. Bashing store Hampaire , uk) using calibrated loops for semi-quantitative method and incubated aerobically at 37c for 24 hours, and those cultures which became negative at the end of 24 hours incubated were further incubated for 48 hours [21].

A specimen was considered positive for UTI if a single organism was cultured at a concentrationof_>105ofU\ml.

Bacteria identification was made using biochemical test, namely indol, citrate, oxidase, H2S production, lysine decarboxylase, lactose fermentation, urea hydrolysis, gas production, catalase coagulase and manitol fermentation [22]. All positive cultures were repeated again to confirm and to be accepted as UTI in association with abnormal urinalysis and UTI symptoms. The strains isolated were identified and diagnosed by Grams stain and biochemical reactions which were done by using Api 20 E and API Staph system (bio Meraux, France). In addition to the characteristics of bacterial colonies on culture media. Antibiotic sensitivity was performed for all isolates by discs diffusion method on Nutrient agar (Oxoid). Different antibiotic disc were used [Table 1]. The inhibition zones of antibiotic disc were measured according to the method of baron 1996 [23].

Results and Discussion

Bacteria species that had been seen in UTIs were of fecal origin . These organisms are a subset of the organisms found in the feces , more than 90% of acute UTIs in patients with normal anatomic structure and function are caused by certain strains of *E.coli* [24] .

10-20 % are caused by coagulase-negative *staphylococcus saprophyticus* 5 % or less are caused by other enterobacteriaceae organisms or enterococci , while in complicated ca*ses* of UTI, such as UTIs resulting from anatomic obstructions, or from catheterization the most common causes of UTI are *E.coli , Klebsiella pneumoniae , Proteus mirabilis ,*

Enterococcus sp. ,Pseudomonas aeruginosa 53 % , 12 % , 6 % , 12 % , 0.4 % [25] .

Out of 300 urine samples, (250) samples showed a positive culture growth while (50) samples have no growth. Eight different isolates obtained with highest incidence for *E.coli* isolate 123 (49.2%) followed by *Proteus mirabilis* isolate 55 (22%) and *Klebsiella pneumonia*e 40 (16 %), while the lowest incidence was for *Morganella morganie*, *Pseudomonas aeruginosa, Citrobacter spp., Staphylococcus aureus* and *Enterobacter spp.* With 10 (4%) , 10 (4%), 7(2.8%), 4 (1.6%) and 1 (0.4%) respectively [Table 2]. In this study, the isolation rate of bacteria from urine was 83.3 %which is comparatively than reports within the country and other part of the world [26]. In our study, results showed that 50 % of the isolates were *E.coli* 7(33.3 %) and *Klebsiella pneumonia*e 4(19 %) while other gram negatives were found in asmall in number. On the

otherhand, isolated gram positive bacteria were *Staphylococcus aureus* with proportion of 1 (4.8 %) [27].

In other study result showed seven different isolates obtained with highest incidence for *E.coli* 115 (39.7 %) followed by *Proteus mirabilis* 70 (24.2 %) and *Klebsiella pneumonia*e 60 (20.8 %) while the lowest incidence was for *Morganella morganie*, *Pseudomonas aeruginosa, Citrobacter spp.and Staphylococcus aureus* with 19 (6.6%) ,14(4.9%),10(3.5%) and 1(0.3%) respectively [28] .

E .coli is the major a etiological agent in causing UTI which accounts for up to 90% cases [29] In this study, the most frequent Uropathogens were Gram negative which made up (90.8%) ofalltheisolates.

Regarding sex, the study showed that the percentage of UTI in female was higher than in male four most isolates obtained except in *Klebsiella pneumonia*e was higher in male than female, it was (52.5 %) and its significant [Table 3].

Woman is at great risk for UTI primarily because of the significantly shorter urethra and closer proximity to the rectum. The female genitalia may become colonized with pathogenic bacteria that can more easily enter the urethra. In addition, woman lack the bacteriostatic protection that prostatic secretions offer the male [30].American women are 30 times more likely to have UTI than men [31] .In our study showed that the percentage of UTI in female was higher than in male four most isolates obtained except in *Klebsiella pneumonia*e was higher in male than female, it was (61.66%) and its significant .

All patients taken were between 1-69 years old, [Table 4] showed the age prevalence of UTI and revealed highest incidence in elder patient than in younger ones (24, 29.2 , 28) % were for ages (40-49 , 50-59 ,60-69) respectively .20-25% of elder women have UTI because of the number of biological factor including estrogen loss, after menopause, the wall of urinary tract thin out weakening the mucous membrane and reducing the ability to resist bacteria , the bladder may lose elasticity and fail to empty completely , besides poor over all health. 5-15% of men older than 50 -65 will have asymptomatic UTI more likely because of prostate problems [32].

In other study showed the age prevalence of UTI in elder patient than in younger (17.99, 28.72, 22.5) % were for age (40-49, 50-59, 60-69) respectively [28]. In other study showed the age range of patients was between 19-39 years is 53.5%, 40-49 is 25.9% [33].

Regarding, month distribution of the UTI obtained in the study. [Table5] the highest incidence was in summer season. It reaches the peak during July and August (56.4%) while (43.6%) distributed on the rest of the months of year .Infection caused by these bacteria has seasonal variation with higher incidence in summer and full in winter and spring may be due to hot weather and bad hygiene management during summer.

our study showed highest incidence was in summer season during July ,August and September about (58.06%) while(41.94%) 0n the rest of the months [34] .

Bacterial Uropathogens from patients with UTIs revealed the presence of high levels of single and multiple antimicrobial resistances against commonly prescribed drugs. The increasing rates of resistance to uropathogenic, *E.coli* isolates reported worldwide, antibiotic susceptibility pattern of these isolates revealed that for our patients, [Table 6].

The inhibition zone of the antibiotic discs were measured on nutrient agar for all isolates, the sensitivity of bacterial isolates to the antibiotics was tested, and the results showed that most isolates were resistant to antibiotic in different ranges. *E.coli* which the predominant cause of UTI showed high percentage of resistance to Tetracycline and penicillin (100 %) ,and low resistance to Streptomycin and Chlorompinicol (18.6 % , 24.4 %) respectively . Sensitive to Streptomycin and Chlorompinicol (81.4%, 75.6 %) respectively.

Other study showed *E.coli* high percentage of resistance to Tetracycline and Amoxicillin (83%, 87%) respectively. [35].

Proteus mirabilis which is the second most prevalent pathogen of UTI showed high resistance to Rifampicin (100%) and Lincomycin (94.5%) and low resistance to Chlorompinicol (9%), sensitive to Chlorompinicol (91%).

Klebsiella pneumoniae showed high resistance to Rifampicin (100%) and Penicillin (75%) and low resistance to Chlorompinicol (12, 5%), sensitive to Chlorompinicol (87.5%) , Gentamycin (80%) and Nalidixie (80%) .

Morganella morgnii showed high resistance to Lincomycin, Rifampicin (100%) respectively and low resistance to Streptomycin (20%), sensitive to Streptomycin (80%) .

Pseudomonas aeruginosa showed high resistance to Lincomycin, Rifampicin (100%) respectively and low resistance to Amoxicillin (40%), sensitive to Amoxicillin(60%) .

Citrobacter spp. showed high resistance to Lincomycin, Rifampicin (100%) respectively and low resistance to Penicillin (42.9%), sensitive to Amoxicillin(71.4%) .

Staphylococcus aureus showed high resistance to Streptomycin, Nitrofurantin (100%) respectively and low resistance to Penicillin, Chloramphenicol, Amoxicillin (25%) respectively, sensitive to Lincomycin(25%) .

Enterococcus showed high resistance to Lincomycin, Rifampicin, Penicillin, Amoxicillin and Nitrofurantin,Chlorompheniсol,Tetracyclin,Ampicillin and Co-trimoxazole100%) .

Resistance to antimicrobial agents has been noted since the first use of these agents and is an increasing world-wide problem [36] .

our study showed higher prevalence rate of resistance to the commonly prescribed antibiotic agent, finding that 100% of *E.coli* and *Klebsiella pneumoniae* isolate were resistance to Amoxicillin and Ampicillin [37].

On the otherhand very levels of resistance were detected to antibiotic such as Ceftriaxone,Nitrofurantoin and Gentamycin and a comparable rate of sensitivity has been reported for these drugs in previous studies done in Ethiopia [38 ,39] , in Kosovo [40],in Iran [41] and South Croatia [42] .Low resistance were observed for these drugs because they are not easily accessible and relatively expensive in price compared to other .Thus ,the drugs could be considered as alternative option in the empirical treatment of UTIs.

our study in India showed that Nitrofurantoin had the best in-vitro susceptibility profile against *E.coli* [43] .In previous studies, nitrofurantoin was the most active agent (94%) , followed by Gentamycin and Cefpodoxime ,high rates of resistance to Ampicillin (55%) and Trimethoprime (40%),often in combination were observed in both sets of isolates [44] .

Conclusion

The isolation of bacterial Uropathogens with a higher resistance rate for commonly use antimicrobial leave the clinicians with very option to choose drug used for empirical oral treatment for UTI was extremely high level of resistance to tetracycline and penicillin.

As drug resistance among pathogens is an evolving process, routine surveillance an monitoring studies should be conducted to proved physicians with knowledge about the most effective empirical treatment of UTIs.

References

1- Schafer, T. (2001) Urinary tract infections in children younger than 5 years of age : epidemiology,diagnosis,treatment,,outcomes,and,prevention. Paediatrh,Drugs vol13p219-227.

2- Yildiz, B. Kural, N. Duruez, G. Yarar, C. and Akcar, N. (2007) Antibiotic resistance in children with complicated urinary tract infection. Saudi. Ued. J.vol .28.p: 1850- 1854.

3- Ramadan, A.(2003) Prevalence of urinary tract infection in primary school children and its relation to school achievement in Ismailia government [thesis]. Egypt: University Cairo; p184

4-Wu, C. Chiu p. Hsieh, K. Chiu d. et.al. (2004) Childhood urinary tract infection; a clinical analysis of 597 cases. Acta Paediatrh. Taiwan. vol. 45: p328- 333.

5- Nicolle, L. (2008) Uncomplicated urinary tract infection in adults including uncomplicated pyelonephritis. Urad. Clin. North. Am.Vol.35: p1- 12.
6- Lane, D. and Takhar, S. (2011) Diagnosis and management of urinary tract infection and pyleonepliritis. Emergency medicine clinics of North America. vol. 29: p359- 552.
7- Dielubanza, E. and Schaeffer, A. (2011) Urinary tract infection in women . The medical clinical of North America .vol .95: p 27- 41.
8- Chamberlain, N. (2009) The big picture medical microbiology. Chapter 34: P: 341-346.
9- Orenstein, R. and Wong, E. (1999) Urinary tract infection in adults. American family physician.March1.
10- Wilson, NL. and Gaido, I. (2004) Laboratory diagnosis of urinary tract infection in adult patients. Clin. Infect. Dis. Vol.38 p 1150-1158.
11- Pandeg, K. (2001) Urinary tract infection and its management by renal. The Antiseptic. Vol: 98 .p:295-296.
12- Dhingra, K. (2008) A case of complicated UTI; *Klebsiella pneumonia* comphysematous cystitis presenting as abdominal pain in the emergency department . West J.Emerg .Med. vol:.9 .p 171-173 .
13- Foxman, B. (2002) Epidemiology of UTI; incidence, morbidity, and economic costs. Am. J.Med. Vol: 113. P.5-13.
14-Schappert, SM .and Rechlsliner,EA.(2006) Urinary tract infection in adult . National kidney and urologic Diseases information clearing house.
15- Tolkoff, NE. Cotran, RS.and Rubin, r. (2008) Urinary tract infection, pyelonephritis, and reflux nephropathy.
16-Harper, M . and Fowls, G.(2007) Management of urinary tract infection in men . Trends in Urology Gynecology and sexual health 12(1) p: 30-35.
17- Dielubanza , E. and Schaeffer , A. (2011) Urinary tract infection in women . Medical Clinical of North America 95 (1) p: 27-40.
18-Colgan, R. and Willams, M. (2011) Diagnosis and treatment of a cute uncomplicated cystitis. American family physician 48 (7) p: 771-776.
19-Nicotte, L. (2008) Uncomplicated urinary tract infection in adults including uncomplicated pyelonephritis. Ural Clinic North America 35(1) p: 1-12.
20- Salvatore, S. and Cattion, E. (2011) Urinary tract infection in women. European Journal of obstetrics gynecology, and reproductive biology 156 (2) p; 131-136,
21-John, L.and Brush, M. (2011) Urinary tract infection in males. Antimicrobial chemo her . 66 (3) p: 650-656.
22- Inabo, H. and Obanibi, B. (2006) Antimicrobial susceptibility of some urinary tract clinical isolate to commonly used antibiotics. African J. Biotechnology. 5(5) p: 487-489 .
23-Samuel,.Baron,(1996).Medical Microbiology,4th edition . university of Texas Medical Bronch SBN-10 .
24- Tessema, B. Kassu, A. and Mulu, A. Yismaw, G. (2007) Predominant and their susceptibly pattern in gender university teaching hospital. Ethio Med.J vol: 45: p:1-67.
25- Rakaa, L . G. *et.al* (2004) Etiology and susceptibility of urinary tract infection isolates in Kosovo. Int. J.Antimicrob agents 23-25.
26- Kebira, AN. Ochola, P. and Khamadi, SA.(2009) Isolation and antimicrobialusceptibility testing of *Escherichia coli* causing urinary tract infection J. Apple Biosci. ; 1320-1325.
27-Gentenet,B. *et al.*(2011). Bacterial Uropathogens in urinary tract infection and antibiotic susceptibility pattern in jimma university specialized hospital south west ethiooia.Ethiop J.Health sci vol:21 No.2 .
28- Janet, A. (2010). Detection of some bacterial infection in urinary tract and their antibiotic sensitivity .International J for sci and Tec. Vol:5 No.3 p. 21-29 .
29-Ronald ,A (2002) .The etiology of urinary tract infection :Traditional and Emerging Pathogen.*Am.J Med* 113 suppli1A: 14S-19S .

30- Gupta ,K,ScholesD,and Stamm WE.(1999).Increasing prevalence of antimicrobial resistance among Uropathogens causing a cute uncomplicated cystitis in women. Jama 281 (8): 73-75 .
31- Saint D *et al*..(1999) T he effect iveness of a clinical practice guideline for the management of premed uncomplicated of premed uncomplicated UTI in women . The American J Med 06:p638-641.
32-Stamm, WE. And Horton, TM. (1993) Management of urinary tract infection in adults. ME JM. 329:1328-1334 .
33- Wilson ML, and Gaido L (2004). Laboratory diagnosis of UTIs in adult patients .Clin Infect Dis. 38 :1150-1158 .
34-Uhair Minutemen, M.(1988) Epidemiology of symptomatic infections of the urinary tract in children. BMJ 297:p450-452.
35- Mezue K.*et al* ,.(2005). Antibiotic sensitivity patterns in UTI at a Tertiary Hospital . Medicin on CD- Rom oxford university v:1 522-528 .
36- Sefton AM. (2002). The impact of resistance on the management of UTIs . Int. J Antimicrobial Agents 16: 489-491 .
37- Tessema D .*et al,*.(2007) . Predominant isolates of urinary tract pathogens and their susceptibility pattern in gender university teaching hospital ,North west Ethiopia .Ethio Med J 45 P 61-67 .
38- Assfa A ,*et al,*. (2008) . Bacterial profile and drug susceptibility pattern of UTI in pregnant women at Tikur Anbessa specialized Hospital Addis Ababa Ethiopia. Ethiop Med. J 46 p 227-235 .
39-Wolday, D. and Erge, W. (1997) Incrated incidence of resistance to antimicrobial by urinary pathogens isolated at Taker Anbessa hospital .Ethiop med J 35: 127 – 135.
40– Rakaa L *et al,*.(2004) Etiology and susceptibility of urinary tract isolates in Kosovo. Int J . Antimicrobial agents 23S1-S2-S5 .
41-Farajnia S, *et al,*.(2009) . Causative agents and antimicrobial susceptibility of UTIs in northwest of Iran .*Int J Infect Dis* 13 p 140-144 .
42- Barisic Z *et al,*.(2003) . Urinary tract infection in south Croatia , etiology and antimicrobial .Int J Antimicrob.Agents 22 S61-S64.
43- Jha N ,Bepat SK. (2005) . A study of sensitivity and resistance of pathogenic micro organisms causing UTI in Katmandu valley Med.J Vol 3 No2 p 123-129 .
44- Alos J ,*et al,*.(2005).Antibiotic resistance of *E.coli* from community acquired UTIs in relation to demographic and clinical data .*Clin Microb infect*11 p 199-203 .

Table (1): The antibiotics discs used to study the sensitivity of the isolate

Antibiotics	Concentration µg\disc	Company
Streptomycin	10	Oxoid(England)
Lincomycin	15	Oxoid(England)
Nitrofurantin	300	Oxoid(England)
Rifampicin	5	Oxoid(England)
Chloramphenicol	30	Oxoid(England)
Tetracycline	30	Oxoid(England)
Ampicilline	25	Oxoid(England)
Penicillin	10 IU	Oxoid(England)
Co-trimoxazole	25	Oxoid(England)
Amoxicillin	25	Oxoid(England)
Nalidixic acid	30	Oxoid(England)
Gentamycin	10	Oxoid(England)

Table (2): Types of isolates isolated from patients with (UTI) and their percentage

isolates	NO. of isolates	percentage
E.coli	**123**	**49.2**
Proetus mirabilis	**55**	**22**
Klebsiella pneumoniae	**40**	**16**
Morganella morganie	**10**	**4**
Pseudomonas aeruginosa	**10**	**4**
Citrobacter spp.	**7**	**2.8**
Staphylococcus aureus	**4**	**1.6**
Enterobacter spp.	**1**	**0.4**
Total	**250**	**100**

Table (3): Sex prevalence in positive case s with (UTI)

Isolates	No. of isolates	Male		Female	
		NO	%	No	%
E.coli	123	53	43.1	70	56.9
proteus mirabilis	55	22	40	33	60
Klebsiella pneumoniae	40	21	52.5	19	47.5
Morgarella morganie	10	4	40	6	60
Pseudomonas aeruginosa	10	2	20	8	80
Citrobacter spp.	7	3	42.9	4	57.1
Staphylococcus aureus	4	0	0	4	100
Enterobacter spp.	1	0	0	1	100
Total	250	105		145	

Table (4): Age prevalence in patients with (UTI)

Age (years)	No. of positive cases	%
1-9.	20	8
10-19.	15	6
20-29.	8	3.2
30-39.	4	1.6
40-49.	60	24
50-59.	73	29.2
60-69.	70	28
Total	250	100

Table (5): Monthly prevalence of (UTI) \ 2010

Month	Positive case	Negative case	Total	% of positive
January	2	8	10	0.8
February	10	14	24	4
March	17	9	26	6.8
April	16	6	22	6.4
May	32	5	37	12.8
June	32	3	35	12.8
July	61	2	63	24.4
August	80	3	83	32
Total	250	50	300	100

(Table 6): The sensitivity of Uropathogens to many antibiotic

Antibiotic		*E.coli* (%)123	*Proetus mirabilis* (%)55	*Klebsiella species* (%)40	*Moganella morgnii* (%)11	*Pseudomonas aeruginosa* 10(%)	*Citrobacter spp.* 7 (%)	*Staphylococcus aureus* 4 (%)	*Enterococcus* 1(%)
Streptomycin	Sensitive Resistant	100(81.4) 23(18.6)	10(18.2) 45(81.8)	30(75) 10(25)	8(80) 2(20)	3(30) 7(70)	3(42.9) 4(57.1)	0 4(100)	1 (100) 0
Lincomycin	S R	23(18.6) 100(81.4)	3(5.5) 52(94.5)	20(50) 20(50)	0 10(100)	0 10(100)	0 7(100)	1(25) 3(75)	0 1(100)
Nitrofurantin	S R	73(59.4) 50(40.6)	35(63.6) 20(36.4)	20(50) 20(50)	5(50) 5(50)	2(20) 8(80)	2(28.6) 5(71.4)	0 4(100)	1(100) 0
Rifampicin	S R	50(40.70 73(59.4)	0 55(100)	0 40(100)	0 10(100)	0 10(100)	0 7(100)	3(75) 1(25)	0 1(100)
Chloromphenicol	S R	93(75.6) 30(24.4)	50(91) 5(9)	35(87.5) 5(12.5)	5(50) 5(50)	3(30) 7(70)	2(28.6) 5(71.4)	3(75) 1(25)	1(100) 0
Tetracycline	S R	0 123(100)	35(63.6) 20(26.4)	20(50) 20(50)	3(30) 7(70)	3(30) 7(70)	3(42.9) 4(57.1)	2(50) 2(50)	1(100) 0
Ampicilline	S R	75(61) 48(39)	30(54.5) 25(45.6)	20(50) 20(50)	2(20) 8(80)	2(20) 8(80)	2(28.6) 5(71.4)	2(50) 2(50)	1(100) 0
Penicillin	S R	0 123(100)	15(27.3) 40(72.7)	10(25) 30(75)	4(40) 6(60)	3(30) 7(70)	4(57.1) 3(42.9)	3(75) 1(25)	0 1(100)
Co-trimo azoles	S R	15(12.2) 108(87.8)	22(40) 33(60)	18(45) 22(55)	5(50) 5(50)	3(30) 7(70)	2(28.6) 5(71.4)	2(50) 2(50)	1(100) 0
Amoxicillin	S R	15(12.2) 108(87.8)	32(58.2) 23(41.8)	18(45) 22(55)	5(50) 5(50)	6(60) 4(40)	3(42.9) 4(57.1)	3(75) 1(25)	0 1(100)
Nalidixie acid	S R	73(59.4) 50(40.6)	18(32.7) 37(67.3)	32(80) 8(20)	4(40) 6(60)	6(60) 0) 4(4	3(42.9) 4(57.1)	2(50) 2(50)	1(100) 0
Gentamicin	S R	75(61) 8(39)	15(27.3) 40(72.7)	32(80) 8(20)	5(50) 5(50)	5(50) 5(50)	3(42.9) 4(57.1)	2(50) 2(50)	0 1(100)

التحري عن الممرضات المسببة لألتهاب المجاري البولية وحساسيتها للمضادات الحياتية

محمد رفيق علي
المعهد الطبي التقني / المنصور / هيئة التعليم التقني

استلم البحث في : 26 أيلول 2012 ، قبل البحث في : 24 حزيران 2013

الخلاصة

التهاب المجاري البولية هي من اغلب الإصابات الشائعة التي تصيب الإنسان ، وتكرارها أكثر من إصابات الجهاز التنفسي والهضمي . وكذلك هي المسبب الغالب للإصابات من داخل المستشفيات في البالغين. من مجموع 300 عينة إدرار جمعت من مرضى تتراوح أعمارهم بين (1-69) سنة ولكلا الجنسين الذين يعانون من التهابات المجاري البولية الوافدين إلى مستشفى اليرموك التعليمي / بغداد خلال المدة من كانون الثاني/2010 الى غاية آب /2010. اغلب العزلات كانت *E.coli* . *Proteus mirabilis*، *Klebsiella pneumoniae* (49.2%-22%-16.22% على التوالي) . وكانت النسب المئوية للعزلات البكتيرية في الإناث أكثر من الذكور في العينات المفحوصة ماعدا *Klebsiella pneumoniae* كانت أعلى في الذكور . وكانت اغلب العينات ايجابية في المرضى البالغين أكثر من الأطفال .

وجد إن الإصابة البكتيرية كانت عالية في فصل الصيف ووصلت أعلى مستوياتها مابين آب(32%) وتموز (24%) . وكانت منها البكتريا الحساسية للمضادات الحيوية (ستربتومايسين ، لنكومايسين ، نتروفيورانتين ، ريفامبسين ، كلورامفينيكول ، تتراسايكلين ، امبيسيلين ، نالدكسك اسد ، جنتامايسين) قد اختبرت وكانت بكتريا القولون الأكثر حساسية للستربتومايسين (81.4%) والكلورامفينيكول (75.6%) بينما الأكثر مقاومة للمضادات الحيوية تتراسايكلين (100%) وبنسلين(100%) .

الكلمات المفتاحية :التهاب المجاري البولية وحساسيتها للمضادات الحياتية