

# Isolation and Identification of Different Causing UTI in Al-Najaf Hospitals

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**Abstract:** This study of urinary tract infection has been planned to isolation and identification of bacterial pathogens. The urine were collected from 516 patients for Al-Najaf Hospitals, they were including (81) male and (435) female. Patients aged between 5 to 60 years. Urine culture had been done for all the 516 patients who were included in this study. Only 221 patients had positive urine culture and 295 negative urine cultures. The most common organism was *Escherichia coli* which was isolated from 200 patients with percentage of 38.75%. *E.coli* was the most prevalent followed by *Staphylococcus saprophyticus* 20.54% (106), *Staphylococcus aureus* 16.66% (86), *Klebsiella spp.* 13.17% (68), *Streptococcus spp.* 5.62% (29), *Proteus spp.* 3.48% (18) and *Pseudomonas aeruginosa* 1.74% (9). The antibiotic susceptibility test was done for *E.coli* isolates to 10 antibiotics.

**Keywords:** UTI, Antibiotics, *Escherichia coli*, Al- Najaf Hospital

## 1. Introduction

Urinary tract infections (UTIs) are some of the common infections experienced by humans, exceeded in frequency among ambulatory patients only by respiratory and gastrointestinal infections [1]. Neonates, girls, young woman and oldermen are most susceptible to UTIs [2]. Urinary tract infection is said to exist when pathogenic microorganisms are detected in the urine, urethra, bladder, kidney or prostate with or without the presence of specific symptoms [3]. The vast majority of uncomplicated UTIs are caused by the gram negative bacillus *Escherichia coli*, with other pathogens including *Enterococcus spp.*, *Staphylococcus saprophyticus*, *Klebsiella spp.* And *Proteus mirabilis* [4]. The extensive and inappropriate use of antimicrobial agents has invariably resulted in the development of antibiotic resistance which, in recent years, has become a major problem world wide. In patient with suspected UTI. Antibiotic treatment is usually started empirically, before urine culture results are available to ensure appropriate treatment, knowledge of the organisms that cause UTI and their antibiotic susceptibility is mandatory. As both temporal and local variables can modify these data, they need to be constantly reevaluated to achieve a maximal clinical response before the antibiotic susceptibility the isolate is known [5]. The aim of the present study to determine the bacterial etiology of UTI and study susceptibility of isolates to some antibiotics.

## 2. Method

**Source of Specimens:** The sample collected from Al-Najaf Hospital. The number of the patients was 516 and they were including 81 male and 435 female. Patients aged between 5-60 years. This study was conducted in the laboratory of department of pathology analysis college, University of Al-Najaf.

**Preparation of culture media:** Media used in this study were prepared according to manufactures in instructions Oxoid, England culture of urine specimens on (MacConkey agar, blood agar, Eosin methylen blue, Kliglar Iron agar,

Simmon Citrate test, Mueller – Hinton agar and Methylene-Vogesproskauer broth).

**Identification of bacteria:** Use microscopic examination cultural appearance and biochemical tests growing on Kliglar Iron agar, Catalase test, Oxidase production, Simmon citrate test, Indole test, Methyl red test, Voges-Proskauer (VP) test [6].

**Antibiotic susceptibility testing:** In vitro susceptibility of the bacterial isolates to ten different antibiotics processed from the Turkish Bioanalyse company was determined using Kirby – Bauer disk – diffusion [7]. The turbidity of growing broth culture was adjusted with sterile broth to obtain concentration optically comparable to the 0.5 MacFarland standards tube (growth equivalent to  $1.5 \times 10^8$  Cell/ml).

The diameter of growth inhibition zones were measured by using transparent ruler. Compared with the standard inhibition diameter of the CLSI (2007). The commercially available discs containing the following antibiotics: Piperacillin, Amoxicillin +Clavulanic, Cefazidime, Ceftriaxone, Gentamicin, Amikacin, Imepenem, Ciprofloxacin, Trimethoprim and Nitrofurantoin

## 3. Results

### Gender distribution on patients

Urine culture had been done for all 516 patients who were included in this study. Total positive urine sample were comprised of 435 (84.3%) sample from female and 81 (15.7%) from males (Table 1).

**Table 1:** Gender distribution on patients

Gender	No. of tested patient	Percentage of tested patient
Female	435	84.3
Male	81	15.7
Total	516	100

**Age groups infected with bacterial isolates *E.coli***

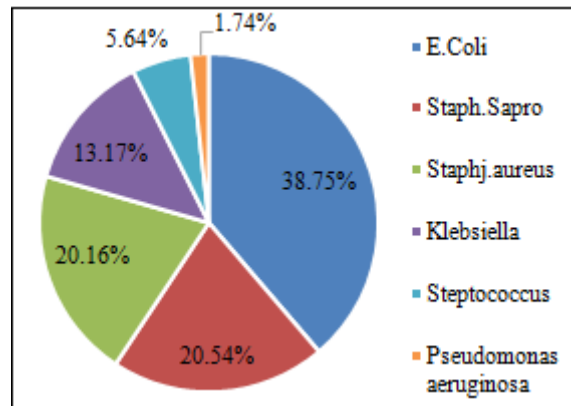
Urine culture had been done for all 516 patients who were included in this study. The highest percentage of infected bacteria *E.coli*

**Table 2:** Age groups infected with bacterial isolates *E.coli* in the age group (16-25) No. 190 (36.8)

Age groups	Number	%
5-15	56	10.9
16-25	190	36.8
26-35	141	27.3
36-45	82	15.9
46-55	27	5.2
56-67	20	3.9

**Bacterial isolates from urine cultures**

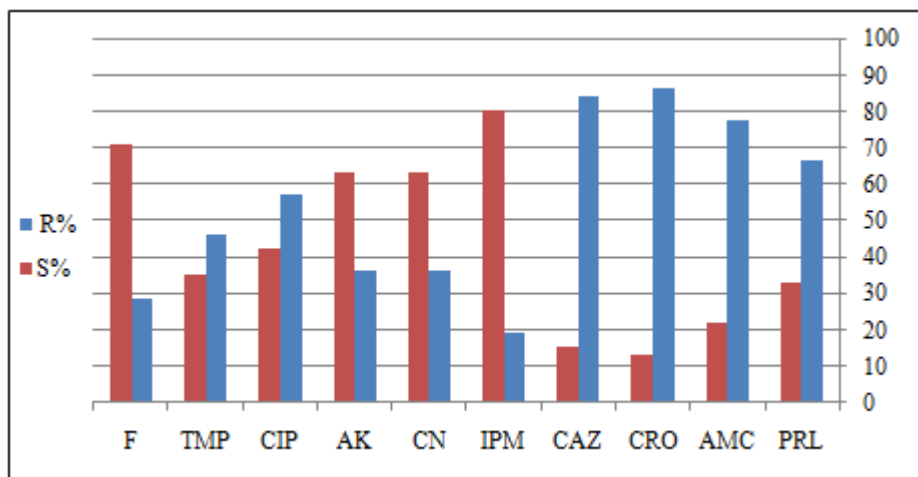
The most common organism was *E. coli* which was isolated from 200 patients with percentage of 38.75%. *E.coli* was the most prevalent followed by *S. saprophyticus* (106) 20.54% (2), *S.aureus* (86) 16.66% (5), *Klebsiella* spp. (68) 13.17% (6), *Streptococcus* spp (29) 5.62%, *Proteus* spp. (18) 3.48% (10) and *Pseudomonas aeruginosa* (9) 1.74% (5). Figure 1



**Figure 1:** Types and percentage of isolated bacteria from urine samples

**Antimicrobial susceptibility testing**

Antibiotic sensitivity test was carried out using disc diffusion technique for *E. coli* isolates to the most commonly antibiotic agents that used in this study. It was found that resistant to piperacillin 67%, amoxicillin + clavulanic 78%, ceftazidime 84.5%, ceftriaxone 86%, imipenem 19.5%, gentamicin 36.5%, amikacin 36.5%, ciprofloxacin 57.5%, trimethoprim 64.5% and nitrofurantoin 28.5%, Figure 2.



**Figure 2:** Antibiotic Sensitivity Patterns of *E. coli*

**4. Discussion**

Urinary tract infection (UTI) are considered as one of the most common groups of infection in humans and effecting either the upper (kidney – pyelonephritis) or the lower (bladder – cystitis) part of the urinary tract [8]. This study appeared higher percentage of patients were infected with bacterial pathogens. *E. coli* was the most prevalent organisms causing UTI, *E.coli* as a commonest cause of UTI may be due to because this bacteria are considered as a normal flora in intestinal tract and present in high Numbers thus may be this bacteria were contaminated the urinary tract because the near of region of the body. The most organisms caused UTI in this study were belonging to gram negative bacteria which were isolated from patients. These results were almost similar to those Al-Mijalli [9], Abrar *et al.* [10] and Motamedifar *et al.* [11]. The prevalence of UTI was higher among females than male patients. Woman are more

prone to have UTI than men this may be cause in female, the urethra is much shorter and closer to the anus than in males and they lack the bacteriostatic properties of prostatic secretions [12].

In present study *E. coli* showed that bacterium resistant for piperacillin (67%), amoxicillin + clavulanic (78%), ceftriaxone (86%), ceftazidime (84.5%) and trimethoprim (64.5%) that agreed to Bahadurlok *et al.* [13], Fayroz-Ali [14], Hadi[15], Suresh *et al.*[16] and Abdu *et al.* [17], whereas other antibiotics were giving different results such as gentamicin (36.5%), amikacin (36.5%), ciprofloxacin (57.5%) and nitrofurantoin (28.5%), that agreed from Lalmangaihzuali *et al.*[18], Suresh *et al.* [16], Tajbakhsh *et al.* [19] and Abdu *et al.*[20]. This study showed weakly resistant for imipenem (19.5%) that agreed to Pirk *et al.*[21]. This might be due to misuse of antibiotic, usage of antibiotic from unknow origin. The uropathogens identified in our

study are similar to those of many other studies conducted in different countries either in the region or internationally [22].

However different results have been reported. the similarities and difference in the type and distribution of uropathogens may result from different environmental conditions and host factors and practices such as health care and education programmes, socioeconomic standards and hygiene practices in each country [23].

The increasing antimicrobial resistance throughout the world make the treatment of UTIs difficult every passing day. The reasons for antibiotic resistance may be the improperly adjusted treatment doses or frequent use of antibiotics in the treatment of various infections, as well as the acquisition of resistance in bacteria with low susceptibility by selection spontaneous mutation or development of resistance in enteric bacteria by R plasmids responsible from multiple drug resistance [24].

## 5. Conclusions

It is concluded that Gram-negative bacilli (Enterobacteriaceae) were responsible for urinary tract infections and most of the strains were multi-drugs resistant. The most common isolated bacteria from urinary tract infections was *E. coli* and the most effective antimicrobial agents amikacin, imipenem, gentamycin and ciprofloxacin against Gram-negative bacilli.

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