



A RESEARCH ARTICLE

Prevalence and Antibiotic Susceptibility of Uropathogenic Bacteria in Patients with Urinary Tract Infections

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Article Information

Abstract

Article history:

Received on: 07/May/2026
 Revised on: 02/Jul/2026
 Accepted on: 17/May/2026
 Available online: 07/Oct/2026
 Published on: 05/Sep/2026

Keywords:

Uropathogens,
 Urinary tract infections,
 Susceptibility
 Multidrug resistance,
 Vitek 2 system.

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Urinary tract infections (UTIs) are among the most common bacterial infections, affecting individuals of all ages, particularly women. The rising rate of antimicrobial resistance among bacteria presents a serious public health issue, necessitating continuous surveillance and updated local data. The current study aims to detect the prevalence of bacterial pathogens responsible for UTIs and estimate their antibiotic susceptibility profiles. Midstream urine samples were collected from patients presenting with UTI symptoms and subjected to standard microbiological culture techniques for isolation and identification of pathogens. The identification of bacterial isolates and antibiotic sensitivity test were performed using Vitek 2 system. *Escherichia coli* was the most common bacteria with 212 (62.4) isolates, followed by *Klebsiella pneumoniae* 50 (14.7), *Proteus mirabilis* 19 (5.6), *Pseudomonas aeruginosa* 13 (3.8) and *S. aureus* 9 (2.6%). Other bacteria isolated were *Enterobacter cloacae* 7 (2.1%), *Enterococcus faecalis* 7 (2.1%), *S. saprophyticus* 6 (1.8%), *Acinetobacter baumannii* 5 (1.5%), *S. haemolyticus* 3 (0.9%), *Burkholderia cepacia* 2 (0.6%), *Enterobacter aerogenes* 2 (0.6%), *Proteus vulgaris* 2 (0.6%), *Citrobacter koseri* 1 (0.3%), *Klebsiella oxytoca* 1 (0.3%) and *Morganella morganii* 1 (0.3%), with varying degrees of resistance observed against commonly prescribed antibiotics. The isolates revealed high sensitivity to imipenem (82.4%) and amikacin (82.1%), with moderate sensitivity to gentamicin (60%). These results underscore the importance of carbapenems and aminoglycosides in managing UTIs, while emphasizing the need for ongoing monitoring of resistance trends.

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1. Introduction

Urinary tract infections (UTIs) refers to an infection in the urinary system including the kidney, ureters, bladder, and urethra [1]. These infections are a key source of morbidity in both community and hospital settings, affecting millions of individuals annually [2]. UTIs occur when pathogens, mostly bacteria, invade and grow in the urinary tract, result in symptoms ranging from mild discomfort to severe complications.

UTIs can affect both genders, particularly women due to anatomical and physiological factors, that aids bacterial entry and colonization of the urinary tract [3]. In addition, other factors can significantly affect the frequency rate of UTIs such as age, hospitalization, past antibiotic treatment and catheterization [4].

A wide range of pathogens cause UTIs, but most commonly by *Escherichia coli*. It has been reported that uropathogenic *E. coli* caused around 80% of UTIs [5], with different virulence factors that aid bacterial infection, like toxins, adhesion factors and iron acquisition [6]. *E. coli* is considered as member of intestinal microbiota. However, it can cause extra intestinal illness such as bacteremia, meningitis, pneumonia and urinary tract infection. Extra intestinal disease results from a translocation of the bacterium from gastrointestinal (GI) tract into other sites of the body [7]. Other Gram-negative bacteria can cause infection include, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*. Gram-positive bacteria such as *Staphylococcus saprophyticus*, *Enterococcus* sp. and fungi such as *Candida* can also cause UTIs [6]. In addition, viruses [8] and parasites can also cause

infection, particularly in immunocompromised people [9]. The extensive and incorrect use of antibiotics has contributed to the development of resistant strains. The rate of UTIs caused by multidrug resistant pathogens is increasing, resulting in a significant increase in the risk of treatment failure and the economic burden of these infections. Various studies revealed that the emergence of multi-drug resistant bacteria demands the appropriate use of antibiotics to combat the problem [10, 11, 12].

In Iraq, and particularly in Baghdad, the burden of UTIs remains substantial. Several studies have investigated the prevalence of bacterial pathogens responsible for urinary tract infections (UTIs) and their antimicrobial susceptibility patterns to facilitate appropriate treatment. Previous studies reported that *Escherichia coli*, *Klebsiella pneumoniae*, and *Staphylococcus* spp. were the most frequently isolated uropathogens [13]. Similarly, another Iraqi study identified *Escherichia coli* as the predominant causative agent of UTIs, followed by *Klebsiella* spp., *Enterococcus faecalis*, *Streptococcus* spp., *Pseudomonas aeruginosa*, *Staphylococcus* spp., *Proteus mirabilis*, and *Acinetobacter baumannii* [14]. Recent studies conducted in Baghdad have reported high rates of antimicrobial resistance among uropathogenic bacteria, with *E. coli* remaining the predominant pathogen and showing considerable resistance to several first-line antibiotics [15]. Furthermore, multidrug-resistant (MDR) strains and biofilm-producing isolates have been increasingly reported, raising concerns regarding treatment failure and recurrent infections [16]. Recent investigations have demonstrated persistent resistance among uropathogens to commonly used antibiotics, whereas susceptibility remains relatively preserved to a limited number of agents, including carbapenems and nitrofurantoin [17,18]. These findings indicate the continued emergence of multidrug-resistant (MDR) organisms and underscore the growing challenge of antimicrobial resistance. However, despite several recent reports documenting high resistance rates among *E. coli*, *K. pneumoniae*, and other Gram-negative uropathogens, comprehensive and up-to-date epidemiological data from many hospitals in Baghdad remain limited. Therefore, this study was undertaken to determine the current prevalence of uropathogenic bacteria and evaluate their antibiotic susceptibility patterns among patients with UTIs in selected hospitals in Baghdad.

2. Methods

2.1. Subjects

A total of (400) urine samples were collected from patients of all ages and genders presenting with clinical symptoms suggestive of UTIs, who were admitted to Baghdad Hospitals during the entire period of study from September 2024 to November 2025.

This study included all patients who presented with symptoms of UTIs and those who did not take treatment in the last two weeks. Patients who were under antibiotic treatment and those without UTI symptoms were excluded from our study.

2.2. Bacterial isolation and Identification

Midstream urine specimens were gathered from patients in sterilized screw cap containers, and a loop full (0.01ml) of urine specimen was inoculated on the culture media (MacConkey agar and Blood agar) and incubated aerobically at 37°C for (18-24) hours, and then examined for bacterial growth. Bacterial identification and sensitivity testing were done using the Vitek-2 compact system. This instrument uses identification/antimicrobial susceptibility cards (ID/AST cards).

2.3. Statistical analysis

Statistical analysis was achieved with the Chi-square test by Statistical Package for Social Sciences (SPSS) version 24. P-value less than 0.05 was considered as statistically significant.

3. Results and discussion

3.1. Distribution of UTI patients in relation to some factors

The improper and uncontrolled use of antimicrobial agents in the treatment of infections plays a major role in the emergence and spread of antimicrobial resistance. Therefore, it is important to continuously investigate the state of antimicrobial resistance. This concern formed the main aim of the current study, particularly in the case of urinary tract infections. This study investigated the isolation,

distribution, and antibiotic susceptibility profiles of pathogenic bacteria causing UTIs in hospitals in Baghdad.

In the current study, a total of [400] urine samples, 300 from females and 100 from males, were collected and processed during the study period. Out of these, [340] showed significant bacterial growth.

Analysis of the data showed that the majority of UTI patients were female. The prevalence of UTIs was high in females 262 (77.1%) than males 78(22.9%) with a significant difference at $P \leq 0.05$. This finding was consistent with several previous studies [19,20,21]. Females are more vulnerable to urinary tract infections due to their anatomy: their urethra is shorter than men's urethra and it is closer to the anus [22,23]. In addition, hormonal changes during pregnancy and menopause affect significantly to the rise of UTIs risk [24].

The results also revealed that UTIs were more incidence in age group of 1-9 years (21.8 %), followed by the age group >60 (15 %). (Table 1, Figure 1).

Table 1. Characteristics of UTIs patients with significant bacterial growth.

Total n*(%)	Sex n(%)	Age group	Year n(%)	Female	Male	Value n (%)
340(100)	Male	78(22.9)	<1	21	17	38(11.2%)
	Female	262(77.1) **	1-9	66	8	74(21.8 %)
			10-19	36	2	38(11.2 %)
			20-29	41	4	45(13.2 %)
			30-39	30	7	37(10.9 %)
			40-49	19	15	34(10.0 %)
			50-59	17	6	23(6.8 %)
			>60	32	19	51(15 %)

N* number of patients, ** $p \leq 0.05$

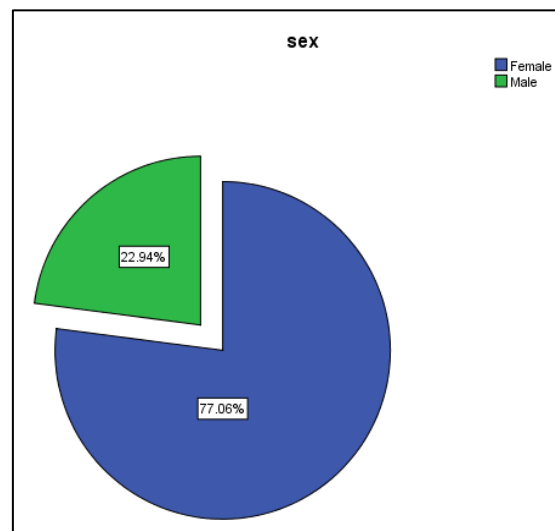


Figure 1. The incidence of UTIs in relation to gender

3.2. Distribution of bacterial isolates from urine sample

A total of 340 bacterial isolates were identified, 322(94.7%) isolates revealed Gram-negative bacteria, and 18(5.3%) revealed Gram-positive bacteria (Table 2). *Escherichia coli* was the most common bacteria with 212 (62.4) isolates, followed by *Klebsiella pneumonia* 50 (14.7), *Proteus mirabilis* 19 (5.6), *Pseudomonas aeruginosa* 13 (3.8) and *Staphylococcus aureus* 9 (2.6%). Other bacteria isolated were *Enterobacter cloaca* 7(2.1%), *Enterococcus faecalis* 7(2.1%), *Staphylococcus saprophyticus* 6(1.8%), *Acinetobacter baumannii* 5 (1.5%), *Staphylococcus haemolyticus* 3 (0.9%), *Burkholderia cepacia* 2 (0.6%), *Enterobacter aerogenes* 2 (0.6%), *Proteus vulgaris* 2 (0.6%), *Citrobacter koseri* 1 (0.3%), *Klebsiella oxytoca* 1 (0.3%) and *Morganella morganii* 1 (0.3%). The distribution of uropathogens is shown in Table 2.

Table 2. The distribution of uropathogens

	Bacterial isolates	Value n(%)
1.	Acinetobacter baumannii	5 (1.5)
2.	Burkholderia cepacia	2 (0.6)
3.	Citrobacter koseri	1 (0.3)
4.	Escherichia coli	212 (62.4)
5.	Enterobacter aerogenes	2 (0.6)
6.	Enterobacter cloaca	7 (2.1)
7.	Enterococcus faecalis	7 (2.1)
8.	Klebsiella oxytoca	1 (0.3)
9.	Klebsiella pneumonia	50 (14.7)
10.	Morganella morganii	1 (0.3)
11.	Proteus mirabilis	19 (5.6)
12.	Proteus vulgaris	2 (0.6)
13.	Pseudomonas aeruginosa	13 (3.8)
14.	Staphylococcus aureus	9 (2.6)
15.	Staphylococcus haemolyticus	3 (0.9)
16.	Staphylococcus saprophyticus	6 (1.8)
	Total	340 (100)

In this work, gram-negative bacteria were identified as the main causative pathogens of UTIs, which agrees with previous studies [21,25]. Their predominance may be because of their virulence factors, comprising toxins, enzymes, iron-acquisition systems, and adhesion factors that facilitate adherence to and colonization of uroepithelial cells [26]. Urinary tract infections (UTIs) are caused by a variety of uropathogens; however, *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus faecalis*, and *Staphylococcus saprophyticus* are the most frequently reported [6]. The results demonstrated that *Escherichia coli* was the most frequently isolated pathogen, accounting for 212 isolates (62.4%). The predominance of *E. coli* observed in this study is consistent with findings from previous studies conducted in Iraq and other Arab countries, which also reported *E. coli* as the leading cause of UTIs [27,28]. In addition, this result is consistent with global epidemiological data, where *E. coli* accounts for 70–90% of community-acquired urinary tract infections (UTIs) due to its array of virulence factors including adhesins, hemolysins, and siderophores that facilitate colonization and persistence in the urinary tract [6]. In the current study, *K. pneumoniae* was the second most common isolate (14.7%), which aligns with reports from Asia and the Middle East showing prevalence rates between 10–20% [29]. The clinical significance of *K. pneumoniae* lies in its ability to acquire extended-spectrum β -lactamases (ESBLs) and carbapenem resistance, posing challenges for empirical therapy [30,31]. *Proteus mirabilis* (5.6%) and *Pseudomonas aeruginosa* (3.8%) were also notable. Gram-positive organisms such as *Staphylococcus aureus* (2.6%), *Enterococcus faecalis* (2.1%), and *Staphylococcus saprophyticus* (1.8%) were also identified. *S. saprophyticus* is a recognized cause of UTIs in young women, while *Enterococcus* species are associated with hospital-acquired infections and intrinsic resistance to many antibiotics [32]. Less frequent isolates, including *Morganella morganii*, *Citrobacter koseri*, and *Burkholderia cepacia*, underscore the diversity of uropathogens. Although their prevalence is low, they may reflect hospital environments, immunocompromised patients, or prior antibiotic exposure.

3.3. Antibiotic susceptibility patterns of uropathogens to antibiotics used in the treatment of UTI

The antibiotic susceptibility profiles shown variable susceptibility among the isolated uropathogens. The isolates showed highly sensitive to imipenem (82.4%) and Amikacin (82.1%) with significance differences at $P \leq 0.05$. In addition, they were sensitive at a percentage of 60%, 45.6%, and 45.3% for gentamycin, ciprofloxacin and piperacillin/Tazobactam respectively. Furthermore, they showed low sensitivity to Ceftazidime, cefepime and trimethoprim at a percentage of 28.8%, 32.1% and 27.6% respectively (Table 3). The highest antibiotics sensitivity of *E. coli* was to imipenem and Amikacin at a percentage of (89.6%, 86.3%), respectively. *A. baumannii* was sensitive to cefepime and imipenem at a percentage of 60%. However, no isolates were sensitive to ciprofloxacin and Trimethoprim/ Sulfamethoxazole. *Burkholderia cepacia* was sensitive to Ceftazidime 100%. While no

isolates were sensitive to ciprofloxacin to gentamycin. *Klebsiella pneumonia* was sensitive at a highest percentage (84.0%) to Amikacin, followed by imipenem (76.0%). *Proteus mirabilis* was sensitive to Amikacin at a percentage of (63.2%), followed by Piperacillin/ Tazobactam and ciprofloxacin at a percentage of (57.9%) for each. *Proteus vulgaris*. was sensitive to imipenem, Ceftazidime, Amikacin, gentamycin and ciprofloxacin at a percentage of (100%). While no isolates were sensitive to Piperacillin/Tazobactam. *Citrobacter koseri* exhibited complete susceptibility (100%) to imipenem, amikacin, gentamicin, ciprofloxacin, piperacillin/tazobactam, and trimethoprim. Conversely, no susceptibility was observed to ceftazidime and cefepime.. *Klebsiella Oxytoca* was sensitive to Amikacin, gentamycin, ciprofloxacin (100%). In contrast, it showed no sensitivity to imipenem, piperacillin/Tazobactam, trimethoprim Ceftazidime, cefepime at a percentage of (100%).

Enterococcus faecalis was sensitive to imipenem, Amikacin (71.4%, 85.7%), respectively. *Pseudomonas aeruginosa* showed high sensitivity to imipenem at a percentage of (92.3%), followed by Amikacin and gentamycin at a percentage of 84.6% for each. *S. aureus* showed sensitivity to Amikacin, gentamycin and trimethoprim at a rate of 55.6% for each. In contrast, it showed no sensitivity to piperacillin/Tazobactam and Ceftazidime. *S. haemolyticus* was sensitive to Ceftazidime, Imipenem and Amikacin at a percentage of 100%. However, no isolates were sensitive to Trimethoprim. *S. saprophyticus* was sensitive to Imipenem and Trimethoprim at a percentage of 100% and 83.3%, respectively.

Table 3. Antibiotic susceptibility profile of common uropathogens

Bacterial species	Antibiotic sensitivity n(%)								
	n	PIP/TAZ	CAZ	CE	IMP	AK	CN	CIP	TMP
<i>Acinetobacter baumannii</i>	5	1(20)	2(40)	3(60)	3(60)	2(40)	1(20)	0(0.0)	0(0.0)
<i>Burkholderia capacia</i>	2	1(50)	2(100)	1(50)	1(50)	1(50)	0(0.0)	1(50)	1(50)
<i>Citrobacter koseri</i>	1	1(100)	0(0.0)	0(0.0)	1(100)	1(100)	1(100)	1(100)	1(100)
<i>Escherichia coli</i>	212	93(43.9)	51(24.1)	53(25)	190(89.6)	183(86.3)	126(59.4)	88(41.5)	42(19.8)
<i>Enterobacter aerogenes</i>	2	2(100)	0(0.0)	1(50)	2(100)	2(100)	1(50)	0(0.0)	0(0.0)
<i>Enterobacter cloaca</i>	7	3(42.9)	3(42.9)	4(57.1)	4(57.1)	5(71.4)	5(71.4)	5(71.4)	6(85.7)
<i>Enterococcus faecalis</i>	7	2(28.6)	1(14.3)	3(42.9)	5(71.4)	6(85.7)	3(42.9)	2(28.6)	4(57.1)
<i>Klebsiella oxytoca</i>	1	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(100)	1(100)	1(100)	0(0.0)
<i>Klebsiella pneumonia</i>	50	26(52)	22 (44)	24(48)	38 (76)	42(84)	37(74)	29(58)	22(44)
<i>Morganella morganii</i>	1	1(100)	1(100)	1(100)	1(100)	1(100.)	0(0.0)	0(0.0)	0(0.0)
<i>Proteus mirabilis</i>	19	11(57.9)	3(15.8)	4(21.1)	8(42.1)	12(63.2)	7(36.8)	11(57.9)	2(10.5)
<i>Proteus vulgaris</i>	2	0(0.0)	2(100)	1(50)	2(100)	2(100)	2(100)	2(100)	1(50)
<i>Pseudomonas aeruginosa</i>	13	8(61.5)	4(30.8)	5(38.5)	12(92.3)	11(84.6)	11(84.6)	5(38.5)	5(38.5)
<i>Staphylococcus aureus</i>	9	0(0.0)	0(0.0)	3(33.3)	4(44.4)	5(55.6)	5(55.6)	4(44.4)	5(55.6)
<i>Staphylococcus haemolyticus</i>	3	2(66.7)	3(100)	2(66.7)	3(100)	3(100)	2(66.7)	2(66.7)	0(0.0)
<i>Staphylococcus saprophyticus</i>	6	3(50)	4(66.7)	4(66.7)	6(100)	2(33.3)	2(33.3)	4(66.7)	5(83.3)
Total	340	154 (45.3)	98 (28.8)	109 (32.1)	280 (82.4)**	279 (82.1)**	204 (60.0)	155 (45.6)	94 (27.6)

n: number of bacterial isolates, **P≤0.05.

PIP/TAZ: Piperacillin/Tazobactam, CAZ: Ceftazidime, CE: Cefepime, IMP: Imipenem, AK: Amikacin, CN: Gentamicin, CIP: Ciprofloxacin, CE: Cefepime, TMP: Trimethoprim Sulfamethoxazole

The resistance patterns detected in this work confirm the growing challenge of multidrug-resistant pathogens. Most isolates demonstrated resistance to at least three antibiotics, underscoring the limited therapeutic options available. Antibiotic susceptibility testing revealed high sensitivity to imipenem (82.4%) and amikacin (82.1%), with moderate sensitivity to gentamicin (60%). These findings underscore the importance of carbapenems and aminoglycosides in managing UTIs, while highlighting the need for ongoing monitoring of resistance trend. Similar findings have been reported in recent Iraqi studies. A study conducted in Baghdad during 2024 found that uropathogenic *Escherichia coli* exhibited high resistance to ampicillin and trimethoprim-sulfamethoxazole, whereas imipenem and nitrofurantoin remained the most effective agents against the isolates [33]. Likewise, another study from Baghdad reported widespread multidrug resistance among uropathogenic *E. coli* isolates and highlighted the growing prevalence of resistance determinants associated with urinary tract infections [34].

Among the Gram-negative isolates in the current study, *Acinetobacter baumannii* exhibited complete resistance (100%) to ciprofloxacin and trimethoprim-sulfamethoxazole and high resistance to gentamicin and piperacillin/tazobactam (80%). Similarly, *Klebsiella oxytoca* demonstrated complete resistance to piperacillin/tazobactam, ceftazidime, cefepime, and imipenem. These findings are concerning because both species are recognized as important nosocomial pathogens capable of acquiring multiple resistance mechanisms [35,36].

Comparable resistance patterns have been reported in Iraq, where *A. baumannii* isolates showed high resistance to piperacillin (80%) and carbenicillin (81.2%), gentamicin (82%), amikacin (72.6%), cefotaxime (70.2%), ceftazidime (70.2%), and ceftriaxone (71.6%).(37), reflecting the widespread dissemination of multidrug-resistant strains in healthcare settings (37,38). Furthermore, a study conducted in Najaf on urinary isolates of *K. oxytoca* reported no susceptibility to Ampicillin, Cloxacillin, Ceftazidime, Penicillin, Piperacillin with a resistance rate of 100%., highlighting the increasing prevalence of β -lactam resistance among this species [39].

Therefore, the resistance rates observed in the present study are consistent with, and in some cases exceed, those reported in recent Iraqi investigations, suggesting continued antimicrobial selection pressure and the emergence of highly resistant hospital-associated strains.

Similarly, *E. coli* and *Proteus* species showed high resistance to ceftazidime, cefepime, and trimethoprim, consistent with global reports of increasing resistance among Enterobacterale [36]. *Enterobacter aerogenes* was resistant at percentage of 100% for each of Ceftazidime, Ciprofloxacin and Trimethoprim. *Citrobacter Koseri* was highly resistant to Ceftazidime, cefepime (100%). The detection of complete resistance in *Enterobacter aerogenes* and *Citrobacter koseri* further emphasizes the spread of resistance mechanisms across diverse genera. Alarmingly, resistance among Gram-positive isolates such as *Enterococcus faecalis* and *Staphylococcus aureus* was also substantial, particularly against cephalosporins and piperacillin/tazobactam, echoing recent findings of rising multidrug resistance in Gram-positive pathogens [40]. Similar observations have been reported in recent Iraqi studies, which documented increasing multidrug resistance among Gram-positive urinary pathogens [41]. These results align with the latest WHO Global Antimicrobial Resistance Surveillance System (GLASS) report, which documented increasing resistance in urinary tract pathogens worldwide [42]. Taken together, these findings emphasize the urgent need for antimicrobial stewardship programs, routine surveillance, and the judicious use of last-line agents such as carbapenems and aminoglycosides to preserve their efficacy.

4. Conclusion

The current study provides valuable insight into the distribution and antimicrobial resistance profiles of uropathogens isolated from patients in Baghdad hospitals. *Escherichia coli* was confirmed as the predominant pathogen, followed by *Klebsiella pneumoniae*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*, consistent with global epidemiological trends. Most isolates exhibited multidrug resistance, highlighting the growing challenge of antimicrobial resistance in urinary tract infections. These findings emphasize the urgent need for continuous antimicrobial resistance surveillance, rational antibiotic prescribing, and the implementation of effective antimicrobial stewardship programs. Future studies should expand surveillance to include the molecular mechanisms underlying antimicrobial resistance and evaluate the impact of stewardship interventions on clinical outcomes.

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انتشار البكتيريا المسببة لالتهابات المسالك البولية وحساسيتها للمضادات الحيوية لدى المرضى المصابين بالتهابات المسالك البولية

الملخص

تُعد عدوى المسالك البولية (UTIs) من أكثر أنواع العدوى البكتيرية شيوعاً، حيث تصيب الأفراد من جميع الأعمار، ولا سيما النساء. ويشكل ترايد معدلات مقاومة البكتيريا لمضادات الميكروبات تحدياً خطيراً للصحة العامة، مما يستلزم إجراء مراقبة مستمرة وتحديث البيانات المحلية. تهدف الدراسة الحالية إلى تحديد معدل انتشار مسببات الأمراض البكتيرية المسؤولة عن عدوى المسالك البولية وتقييم أنماط حساسيتها للمضادات الحيوية. تم جمع عينات بول من منتصف مجرى البول من مرضى تظهر عليهم أعراض العدوى، وأُخضعت لتقنيات الزرع الميكروبيولوجي القياسية لعزل مسببات الأمراض تم تشخيص العزلات وتشخيص حساسيتها للمضادات الحيوية باستخدام نظام "Vitek 2". وكانت بكتيريا *Escherichia coli* هي الأكثر شيوعاً بواقع 212 عزلة (62.4%)، تلتها بكتيريا *Klebsiella pneumoniae* (14.7%)، و *Proteus mirabilis* (5.6%)، و *Pseudomonas aeruginosa* (3.8%)، و *Staphylococcus aureus** (2.6%)، و *Enterobacter cloacae** (2.1%)، و *Enterococcus faecalis** (2.1%)، و *Staphylococcus saprophyticus** (1.8%)، و *Acinetobacter baumannii* (1.5%)، و *Staphylococcus haemolyticus* (0.9%)، و *Burkholderia cepacia** (0.6%)، و *Enterobacter aerogenes** (0.6%)، و *Proteus vulgaris* (0.6%)، و *Citrobacter koseri** (0.3%)، و *Klebsiella oxytoca** (0.3%)، و *Morganella morganii** (0.3%)، مع ملاحظة درجات متفاوتة من المقاومة للمضادات الحيوية الشائعة الاستخدام. وأظهرت العزلات حساسية عالية تجاه عقاري إيميبينيم (82.4%) وأميكاسين (82.1%)، وحساسية متوسطة تجاه جنتاميسين (60%). وتُبرز هذه النتائج أهمية مجموعتي الكربابينيمات والأمينوغليكوزيدات في علاج عدوى المسالك البولية، مع التأكيد على ضرورة المراقبة المستمرة لاتجاهات المقاومة.

الكلمات المفتاحية: مسببات الأمراض البولية، التهابات المسالك البولية، الحساسية للمضادات الحيوية، مقاومة متعددة للأدوية، نظام

Vitek 2