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Short Communication

Bacteria Causing UTI in Patients at Abu Ghraib, Iraq: Isolation and Identification

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A B S T R A C T

This study aimed to detect the most pathogenic bacteria causing UTI in the Abu Ghraib region in Iraq. A cross-sectional study was done in the clinic to investigate the most common bacterial cause of UTI in patients suffering from UTI symptoms. Patients who visited clinics and whose UTI signs and symptoms were verified by the attending clinician were included in the study. All patients had given their consent to participate in the trial and had no prior history of receiving antibiotics for UTIs in the previous two weeks. Patients who were currently menstruating, had a history of taking an antibiotic within the previous two weeks, or who did not give their consent were not included in the study. Two hundred thirteen midstream urine samples were included in this study obtained from 137 females and 76 males. The age of these patients ranged between 18 and 72 years. The collected urine was examined within 3 hours in the bacteriology laboratory. These samples were cultured on primary media, and then the identification of these unknown bacteria was done. The current study showed that the infections in males were significantly higher than in females. Infection was found to be significantly higher in the age group of 31-50 years than in the other age groups, followed by the age groups of 18-30 years. This study showed that *E. coli* is the most prevalent bacteria isolated from UTI patients, followed by *K. pneumonia*. In conclusion, UTIs are caused mainly by *E. coli* and *K. pneumonia.* They occur mainly in females as compared to males, especially in the age group between 31 and 50 years.

Keywords: UTI, *E. coli*, *K. pneumonia*, Abu Ghraib, Bacteria

Introduction

In most nations around the world, urinary tract infections are the second most prevalent health issue after respiratory tract infections.[1] UTIs can affect both males and females of any age. According to Chen et al., one of the biggest causes of newborn mortality is prostate infection, it was have affected of older men that makes it harder for the bladder to release from the arteries and induces inflammation of the urinary system.[2,3] The main causes of urinary tract infections in older women are hormonal changes brought on by ageing, immunosuppression,[3] pregnancy, and chronic conditions like diabetes or cancer, or HIV which cause immunosuppression and weakened immune systems. All these factors increase the risk of urinary tract infections.[3]

In the cardiac care unit, UTIs account for 20 to 30% of all hospital nosocomial infections.[4,5] Bacteria, which often reside in the gastrointestinal tract, vagina, or the region surrounding the urethra which is at the start of the urinary tract are the primary causes of 95% of UTIs. The majority of these germs pass through the urethra and end up in the kidneys as well as the bladder. Despite fungi, viruses, and parasites, gram-positive bacteria are typically what cause clinical harm.[6] It may also result from a typical source of urinary tract infection. Haemorrhagic cystitis, for instance, caused by viruses like adenovirus, is one example of a non-bacterial haemorrhagic infection.[7]

Widespread harmful gram-negative bacteria including *Klebsiella, Escherichia, Proteus, Pseudomonas, Enterobacter*, and *Serratia spp*. as well as gram-positive bacteria such as *Enterococcus sp., Streptococci,* and *Staphylococcus* are among the pathogens found in critical care units.[8]

Escherichia coli is the primary cause of uropathogenic infections worldwide, accounting for 80%-85% of cases, according to Kariuki et al.[9] It is now well-recognised that the bacteria that cause urologic infections are becoming resistant to antibiotics, particularly those that are often used; because of this, bacteria have evolved defences to fend off these antibiotics, and there is a link between rising resistance and patient antibiotic usage. The presence of the catheter is associated with the production of virulence factors like biofilm because it creates an environment that is conducive to the formation of the biofilm.[10]

This study aimed to detect the most pathogenic bacteria causing UTIs in Abu Ghraib, Iraq.

Materials and Methods

A cross-sectional study was done in the clinic to investigate the most common bacterial cause of UTI in patients suffering from UTI symptoms.

Patients who visited clinics and whose UTI signs and symptoms were verified by the attending clinician were included in the study. The included participants had given their consent to participate in the trial and had no prior history of receiving antibiotics for UTIs within the previous two weeks.

Patients who were currently menstruating, had a history of taking an antibiotic in the previous two weeks, or who did not give their consent were not included in the study.

Two hundred thirteen midstream urine samples were included in this study from 137 females and 76 males. The age of these patients ranged between 18 and 72 years. The collected urine was examined within 3 hours in the bacteriology laboratory. These samples were cultured on primary media, after which the identification of these unknown bacteria was done according to Cheesbrough.[11]

RESULTS AND DISCUSSION

The current study showed that the infections in males were significantly higher than in females (Figure 1).

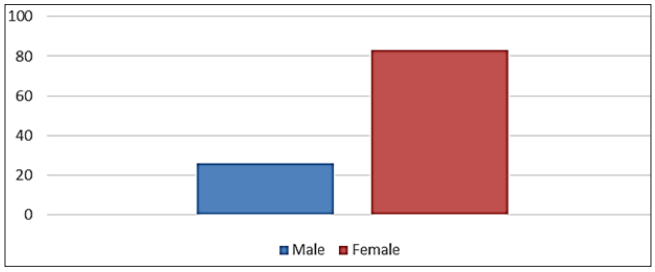

Figure 1.Number of Infected Males and Females

This finding is consistent with many studies as well as local research conducted in Baghdad City, which revealed that females were more likely to have UTIs (81.8%) as compared to males (18.2%).[12] Another study by Ibrahim et al. also showed that infection of UTI in females was significantly higher than in males.[13]

The higher incidence of UTIs in females may be due to the proximity of the urethra to the anus, the broader and shorter urethra, sexual activity, incontinence, vaginal surface's less acidic pH, and unsanitary living situations.[14]

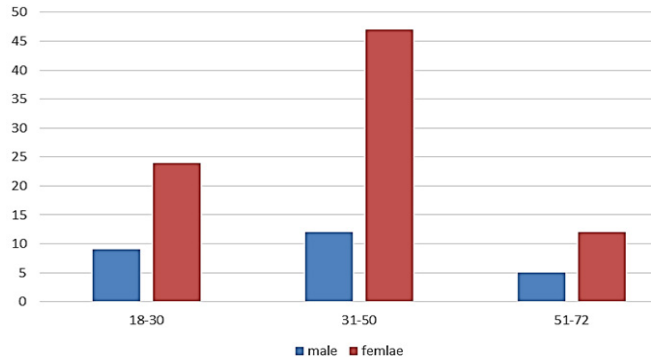

Figure 2.Distribution of Infected People as per Age Groups

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The present study showed that among males and females, the age group of 31-50 years had the highest number of infected people, followed by the age group of 18-30 years (Figure 2).

There were very few studies about infections among different age groups. According to Almukhtar,[15] 58.4% of patients were in the age range of 21-30 years, followed by 26% of patients in the age range of 31-40 years. Additionally, Al-Gasha'a et al.[16] discovered that the prevalence of bacterial UTIs was greater in the age group of 30-39 years (25.40% of the study population).

This study also showed that *E. coli* is the most prevalent bacteria isolated from UTI patients, followed by *K. pneumonia* (Table 1).

Table 1.Bacterial Pathogens isolated from UTI Patients

Bacterial Name	Number of Isolates	Percentages
Escherichia coli	47	41.6
Staphylococcus aureus	14	12.4
Klebsiella pneumoniae	34	30.0
Proteus spp.	8	7.1
Pseudomonas aeruginosa	10	8.9
Total	113	100

Many studies reported that the *Enterobacteriaceae* family was the most prevalent cause of UTI in humans.[17,18] These studies are in agreement with the present findings. Many variables help *Enterobacteriaceae* adhere to uroepithelium. Such bacteria cause adhesion pili and fimbriae to form on the uroepithelial mucosa.[19,20] Additionally, research done in Irbil, Iraq, found that *Klebsiella pneumoniae* (28%) and E. coli (16.8%) were the two most prevalent causes of UTI in children.[21] According to Ramalingam et al.,[22] *Klebsiella spp.* constitutes 50% of bacterium isolates that cause UTI. According to Muharram et al.,[23] *Klebsiella spp.* was the most prevalent microorganism in UTI patients. Asymptomatic Bacteriuria (ASB) caused by *Klebsiella pneumonia* in a pregnant woman was described by Garnizov,[24] *Escherichia coli* was shown to be the most prevalent isolate in two investigations from India and Sudan, while *Klebsiella spp.* is increasingly becoming recognised as the most dangerous urinary pathogen.[25,26]

This finding is consistent with research on UTIs conducted in France, which found that when compared to common bacteria (*E. coli* and *K. pneumonia*), the rates of infection due to pathogens *Pseudomonas aeruginosa, Enterobacter spp*., and *Proteus mirabilis* were the lowest.[27,28]

Conclusion

It can be fairly concluded that UTIs occur mainly in females as compared to males, especially between the ages of 31 and 50 years, and are caused mainly by *E. coli* and *K. pneumonia*.

Conflict of Interest: None

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