

Urinary Tract Infection In Sobrata, Algmel Cities In Libya 2013

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Abstract:

Urinary tract infections are very common particularly in women, babies and the elderly. About one in two women, and one in 20 men will get the infection in their lifetime. The majority of urinary tract infections are urethritis, cystitis, and pyelonephritis. The most common bacteria causes the infection is a bacterium common to the digestive tract called *Escherichia coli*. The most common symptoms of the infection are, burning sensation during urination, blood in urine, and Lower abdominal pain, therefore the infection needs to be investigated as it may indicates more serious conditions. A study with patients, who have come with the symptoms of urinary tract infection in the cities of Sobrata, and Algmel in Libya has been made the number of patients in the study were 582 cases and 926 cases respectively. After the investigations have been made the results shows those 301 women, 66 men in Sobrata city and 354 women, 171 men in Algmel city were infected. The percentage of infection are 63% and 56.69%. Number of women and men who infected by *Escherichia coli* are (165, 46) and (179, 90) cases respectively, this result approves that bacteria *Escherichia coli* is the major causes of urinary tract infection symptoms in most of the patients. The appropriate antibiotics for the infection are Augmentines and Ciprofloxacin based on the study.

Keywords: Urinary Tract Infections (UTI); *Escherichia coli*; Urethritis; Cystitis; Pyelonephritis

Introduction

Urinary tract infections are a serious health problem affecting millions of people each year. Infections of the urinary tract are the second most common type of infection in the body [1]. It is the most common urological disease in the United States with a total annual cost of more than \$3.5 billion [2]. It is one of the most common bacterial infections affecting humans being throughout their life span, it is account for more than 8 million visits to physician's offices, 1.5 million emergency room visits, and 300,000 hospital admissions in the United States annually [3,4]. The annual incidence of UTI in French is 53,000 diagnoses per million persons per year, which represents 1.05% to 2.10% of the activity of general practitioners [5]. In the United States the annual number of diagnoses of pyelonephritis in females was estimated to be 250,000 [5]. These infections are more common in females than in male, and the incidence in women in the age of 20- 40 years ranges from 25 to 30% whereas in elderly patients, older women above 60 years of age, it ranges from 4 to 43% [6,7]. Urinary tract infections are the frequent infections observed in clinical practice and results in a significant morbidity and high medical costs, it is a common infection observed in diabetic patients, which alters the genitourinary system where UTI can be a cause of severe complications ranging from dysuria (pain or burning sensation during Urination) organ damage and sometimes even death due to (pyelonephritis) [8]. The risk factors for UTI involve colonization with a different uropathogen in cases of recurrent UTI, glucosuria and impaired granulocyte function [9]. Urinary tract infection is the second most common clinical indication for empirical antimicrobial treatment in primary and secondary care [10]. Urine samples constitute the largest single category of specimens examined in most

medical microbiology laboratories [10,11]. The diagnosis of UTI is particularly difficult in elderly patients, who are more likely to have asymptomatic bacteriuria as they get older. UTIs can be classified as uncomplicated or complicated [11-13]. Elderly institutionalized patients frequently receive unnecessary antibiotic treatment for asymptomatic bacteriuria despite clear evidence of adverse effects with no compensating clinical benefit [14,15]. Approximately 1 in 3 women will require antimicrobial treatment for a urinary tract infection before age 24, and 40% to 50% of women will have a UTI during their life time. *Escherichia coli* is found to be the most common cause of UTIs and treatment should be based on urine culture [16]. Infections of the urinary tract are among the most common infections in the hospital if not treated promptly and appropriately, and may lead to significant acute morbidity and irreversible renal damage. Children, however, have a wide variety of clinical presentation, ranging from the asymptomatic presence of bacteria in the urine to potentially life threatening infection of the kidney. The main goals are early diagnosis, and appropriate antimicrobial therapy. The purpose was to evaluate the prevalence of UTI among Sobrata city patients and compare them with those from Algmel city patients.

Material and Methods

Clean midstream urine samples were collected in sterile tubes from 582 patients in Sobrata hospital in Sobrata city and from 926 patients in Dar Alshruk clinic in Algmel city in 2013, those patients have come with the symptoms of urinary tract infection, urine samples were transported in ice and processed in the laboratory within 2 hrs of collection by using urine analysis and routine microbiological techniques. The patients were educated about the collection of urine sample to avoid contamination. All urine samples were plated with 100 µl of urine sample using standard pour plate techniques on nutrient agar, blood agar, MacConkey agar (Difco, Kansas, USA), and

incubated at 37°C overnight for visible growth and to isolate the microbial agents of UTI. Urine samples showing colony count more than 10,000 CFU/ml was considered to be significant for urinary tract infections [17]. UTIs isolates were identified following standard biochemical tests. Antimicrobial susceptibility testing was done on Mueller-Hinton agar using disk diffusion technique. This method was done according to Clinical and Laboratory Standards Institute (CLSI) guidelines (2002) to determine susceptibility of UTIs agents [18]. The antibiotics discs used are Ciprofloxacin, Augmentines, Amoxicillin, Penicillin, Kanamycine. The UTIs isolates showed sensitivity against Ciprofloxacin, Augmentines, Amoxicillin in both cities which means they are the proper antibiotics should be prescribed to the patients by physician. Identification of *S. saprophyticus* is made on the basis of the absence of hemolysin and coagulase and resistance to novobiocin. Novobiocin susceptibility test results are 100% sensitive and 96% specific. *S. saprophyticus* is innately resistant to the antibiotic novobiocin. Therefore, screening coagulase-negative staphylococci from urine cultures for novobiocin resistance is a reliable presumptive identification of *Staphylococcus saprophyticus* [19].

Results

A study to the patients, who have come with the symptoms of urinary tract infection in the cities of Sobrata and Algmel, in 2013, has

been made, the number of patients in the study were 582 and 926 cases respectively. After the investigations made by using routine microbiological techniques, the results shows that the percentage of infection in two cities were 63% and 56.69% respectively, and those 301 female (51.72%), 66 male (11.34%) in Sobrata city, and 354 female (38.2%), 171 male (18.5%) in Algmel city were infected from total cases. No urinary tract infection was found in 111 female (19.07%), 104 male (17.87%) in Sobrata city, and 270 female (29.2%), 131 male (14.1%) in Algmel city. UTI isolates in males and females in both cities included *Escherichia coli* 165 (28.35%) female, 46 (7.90%) male in Sobrata city and 179 (19.33%) female, 90 (9.7%) male in Algmel city, following *Staphylococcus saprophyticus* 83 (14.26%) female, 11 (1.9%) male, in Sobrata city and 74 (7.99%) female, 38 (4.1%) male in Algmel city, following *Klebsiella pneumoniae* 37 (6.36%) female, 6 (1.03%) male, in Sobrata city and 66 (7.12%) female, 29 (3.13%) male in Algmel city, and followed by *Streptococcus faecalis* 16 (2.75%) female, 3 (0.52%) male in Sobrata city and 35 (3.77%) female, 14 (1.51%) male in Algmel city, this result approves that bacteria *Escherichia coli* was the most common prevalent causes of UTI in most of the cases in Sobrata and Algmel cities, also the infection is more frequent in female than male and more in Sobrata city than in Algmel city in Libya (Table 1-3).

UTI pathogen	Prevalence of UTI (Female) (%)	Prevalence of UTI (Male) (%)	Total infection (%)	Non-infected (%)
Percent of infections	301 (51.72%)	66 (11.34%)	367 (63.06%)	215 (36.94%)
<i>Escherichia coli</i>	165 (28.35%)	46 (7.90%)	211 (36.25%)	
<i>Staphylococcus saprophyticus</i>	83 (14.26%)	11 (1.89%)	94 (16.15%)	
<i>Klebsiella pneumoniae</i>	37 (6.36%)	6 (1.03%)	43 (7.39%)	
<i>Streptococcus faecalis</i>	16 (2.75%)	3 (0.52%)	19 (3.27%)	

Table 1: Bacterial species in UTI according to the sex in 367 patients from Sobrat city -shows the prevalence of UTI pathogens according to sex males and females. Commonly recovered UTI pathogens in female and male included *E. coli* 165 (28.35%), 46 (7.90%), *Staphylococcus saprophyticus* 83 (14.26%), 11 (1.89%), *Klebsiella pneumoniae* 37 (6.36%), 6 (1.03%), *Staphylococcus faecalis* 16 (2.75%) 3 (0.52%).

UTI pathogen	Prevalence of UTI (Female) (%)	Prevalence of UTI (Male) (%)	Total infection (%)	non infected (%)
Percent of infections	354 (38.2%)	171 (18.3%)	525 (56.7%)	401 (43.3%)
<i>Escherichia coli</i>	79 (19.33%)	90 (9.72%)	169 (29.05%)	
<i>Staphylococcus saprophyticus</i>	74 (7.99%)	38 (4.10%)	112 (12.09%)	
<i>Klebsiella pneumoniae</i>	66 (7.12%)	29 (3.13%)	95 (10.25%)	
<i>Streptococcus faecalis</i>	35 (3.77%)	14 (1.51%)	49 (5.28%)	

Table 2: Bacterial species in UTI according to the sex in 525 patients from Algmel city -shows the prevalence of UTI pathogens according to sex males and females. Commonly recovered UTI pathogens in female and male included *E. coli* 179 (19.33%) 90 (9.72%), *Staphylococcus saprophyticus* 74 (7.99%) 38 (4.10%), *Klebsiella pneumoniae* 66 (7.12%) 29 (3.13%), *Staphylococcus faecalis* 35 (3.77%) 14 (1.51%).

UTIs isolates	Appropriate antibiotics
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<i>Escherichia coli</i>	Ciprofloxacin, Augmentines, Amoxicillin
<i>Staphylococcus saprophyticus</i>	Ciprofloxacin, Augmentines
<i>Klebsiella pneumonia</i>	Ciprofloxacin, Augmentines
<i>Streptococcus faecalis</i>	Ciprofloxacin, Augmentine

Table 3: The appropriate antibiotics for UTIs isolates in the study based on Antimicrobial susceptibility testing

By looking at Table 3, we could realize that the most effective antibiotic for the most of the UTIs isolates were Ciprofloxacin, and Augmentine.

Discussion and Conclusion

In this study 582 and 926 samples with a presumptive diagnosis of bacterial urinary tract infection were analyzed. The prevalence of acute bacterial UTI was 63% in Sobrata city and 56.69% in Algmel city respectively, female were more affected by the infection than male, except with *klebsiella pneumoniae*, and *Streptococcus faecalis* male were more affected, and the infections were more predominant in Sobrata city than Algmel city. The total infection of male to female ratio was 1:4 in Sobrata city and 1:2 in Algmel city. The prevalence of *Escherichia coli* in Sobrata and Algmel respectively is (36.25%) (29.05%) which make it the predominant organism identified, followed by *Staphylococcus saprophyticus* (16.15%) (12.09%), followed by *klebsiella pneumoniae* (7.39%) (10.25%), followed by *Streptococcus faecalis* (3.27%) (5.28%), and a little *Candida* Spp, this results compatible with the fact that *E. coli* is the most common causes of urinary tract infection. We come out with the study to diffuse awareness about the causes of UTI, and to raise awareness of the risk of giving antibiotics and their direct impact in the outcome analysis of urine tract infections.

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