

## Research Article

# Frequency of Urinary Tract Infections in Young Women in Tijuana

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## Abstract

**Background:** Urinary tract infection (UTI) is one of the most common infectious diseases in the world. It manifests with a wide variety of clinical conditions ranging from asymptomatic bacteriuria to acute pyelonephritis. The etiology of community UTIs in women are caused by *Escherichia coli* in 80-85% of cases, *Staphylococcus saprophyticus* (5-10%) and a lesser extent by *Klebsiella pneumoniae* and *Proteus mirabilis*.

**Aim:** The purpose of this study is to determine the frequency of urinary tract infection in young women in Tijuana, Mexico.

**Design and Setting:** Descriptive cross-sectional study.

**Methods:** In young women patients in the Family Medicine Unit #27, Tijuana, Mexico; a descriptive cross-sectional study was conducted in order to determine the frequency of urinary tract infection from April to September 2018. We obtained general data such as age, schooling, occupation and marital status. For statistical analysis, we applied descriptive statistics; for qualitative variables frequencies and percentages were used.

**Results:** We analyzed a sample of 1219 patients in the period between April to September 2018; we found 1219 cases of women aged 20-40 years with urinary tract infection, 3.9% (n=48) were patients with diagnosis of subsequent UTI in the last 6 months and 11.8% (n=144) pregnant patients, with a total of 1075 cases of ITUs in the six months of the study.

**Conclusion:** Urinary tract infections is one of the main reasons for consultation. The results obtained agree with the data described in the clinical practice guide, in which it is mentioned that 40-60% of the female population will have an episode of UTI during their life with 3-5% recurrence, in our case it was 3.9%.

**Keywords:** Urinary tract infections; bacterial resistance; *Escherichia coli*

## Introduction

Urinary tract infection (UTI) is one of the most common infectious diseases in the world. It manifests with a wide variety of clinical conditions ranging from asymptomatic bacteriuria to acute pyelonephritis. A recurrent lower urinary tract infection is defined as 3 or more episodes in the last 12 months or two episodes in the last 6 months [1]. According to the clinical practice guide of uncomplicated acute urinary tract infection in women (2009), urinary tract infections are in the top 10 reasons for consulting family medicine in Mexico [2]. Worldwide, it is estimated that around 150 million urinary tract infections occur annually. It is considered that 40-60% of women will have an episode of urinary tract infection once in their life, and 3-5% of all women will have multiple recurrences [3].

In Baja California, according to the 2015 epidemiology yearbook, there were 74,110 cases of urinary tract infection in women in the State of Baja California, including all institutions, with the largest number of cases in the Instituto Mexicano del Seguro Social (IMSS) [4]. Bacterial infection is usually acquired ascending from the urethra to the bladder and can continue to the kidney. Occasionally, bacteria that infect the urinary tract invade the bloodstream to cause bacteremia.

Less frequently, the infection may be due to hematogenous spread of a microorganism to the kidney and in those cases the first part of the tract that becomes infected is the kidney tissue. Active sex life and advanced age are risks factors for symptomatic bacteriuria [5].

The etiology of community UTIs in women are caused by *Escherichia coli* in 80-85% of cases, *Staphylococcus saprophyticus* (5-10%) and a lesser extent by *Klebsiella pneumoniae* and *Proteus mirabilis* [2]. Urinary tract infections are classified as high (pyelonephritis) and low (confined to bladder), which can be complicated or uncomplicated. Uncomplicated urinary tract infection occurs in a host that has no functional or structural abnormalities, not pregnant or in patients who have not been instrumented (catheters), all the other infections are considered complicated [6]. The diagnosis of uncomplicated urinary tract infection is based on the clinical symptoms and the qualitative analysis for detection of abnormalities in urine, this analysis has a limited value, causing unnecessary risks in the prescription of antibiotics and increasing antibiotic resistance [7].

Treatment options according to the guidelines of Mexican clinical practice on acute urinary tract infection are: nitrofurantoin (100 mg twice daily for 5 days), appropriate option for therapy

due to minimal occurrence of adverse effects and low resistance; trimethoprim-sulfamethoxazole (160/800 mg twice daily for 3 days) [8]; fluoroquinolones (ofloxacin, ciprofloxacin and levofloxacin), in 3-day regimen with posology according to each active compound, however, should be considered as alternative therapy, as the prevalence of resistance to fluoroquinolones is thought to be greater than 10%, therefore an intravenous dose of 1 gram of ceftriaxone or a dose in 24 hours of an aminoglycoside is recommended, is an appropriate option for therapy in patients who do not require hospitalization [9]. Betalactams (amoxicillin-clavulanic acid, cefdinir, cefaclor and cefpodoxime, cephalexin), 3-7 days, generally have lower efficacy and more adverse effects compared to other antimicrobials used in urinary tract infections, should be used with caution for non-cystitis complicated [10]. Based on the above, the main objective of the study is to determine the frequency of urinary tract infection in young women in Tijuana, Mexico.

## Materials and Methods

A descriptive cross-sectional study was carried out, in the Family Medicine Unite #27, of the Instituto Mexicano del Seguro Social (IMSS), located in Tijuana, Mexico; in patients which were selected by a consecutive sampling techniques; that met the following inclusion criteria: age between 20-40 years, with urinary tract infection, it was not necessary to sign the informed consent due to the fact that only clinical records were reviewed; patients with pregnant, genitourinary malformations, kidney stones or vaginal infections were excluded and patients with incomplete information were eliminated. The following data were obtained directly from patients or medical records: age, marital status, schooling, occupation and history of urinary tract infection.

The procedure for the data collection was as follows: age was calculated in years according to the year of birth; occupation, marital status and schooling was determined by medical record information; history of urinary tract infection was determined with the patient's laboratory record, through a general urine test or urine culture. The recollected data was integrated into data collection sheets and analyzed using the SPSS program version 20 in Spanish, where we applied descriptive statistics; for qualitative variables, frequencies and percentages were used and for quantitative variables, mean and standard deviation were used. The Kolmogorov-Smirnoff test was used to establish the normality of the data. The Protocol was authorized by the Local Committee of Research and Ethics in Health Research.

## Results

We analyzed a sample of 1219 patients in the period between April to September 2018; we found 1219 cases of women aged 20-40 years with urinary tract infection, 3.9% (n=48) were patients with diagnosis of subsequent UTI in the last 6 months and 11.8% (n=144) pregnant patients, with a total of 1075 cases of ITUs in the six months of the study. In the marital status of patients with urinary tract infection we found a frequency of 36.9% (n=136) in married women, 30.6% (n=113) in single women, 29% (n=107) free union and 3.5% (n=13) divorced. In schooling, most of the patients had secondary studies with 37.9% (n=140), 27.9% (n=103) high school, 12.2% (n=45) primary, 11.1% (n=41) bachelor's degree and 1.1% (n=4) illiterate. In

occupation we obtained a higher frequency of UTIs in women who were working with 75.3% (n=278), housewives 21.1% (n=78) and students 3.5% (n=13).

## Discussion and Conclusion

Urinary tract infections is one of the main reasons for consultation. The results obtained agree with the data described in the clinical practice guide, in which it is mentioned that 40-60% of the female population will have an episode of UTI during their life with 3-5% recurrence, in our case it was 3.9%. Recurrence may be a consequence of bacterial resistance. The resistance to antimicrobial agents is generally due to the selection of resistant strains in the environment, or due to the exchange of genetic material among different species. The way that organisms become resistant is the exchange of DNA. Gram-negative species are the most frequently involved in urinary tract infection, such as *E. coli*, can become resistant through conjugation, with DNA transfer from one member to another [1]. A general urine test is the first step in the laboratory diagnosis of urinary tract infection; however, no studies are necessary to begin treatment with suggestive clinical data. A sample of urine taken under sterile conditions is centrifuged for five minutes and then the pellet is examined at high magnification; the next step in the diagnosis of urinary tract infection is urine culture (gold standard), in this case a count of more than 100,000 CFU/ml (> 10,000 CFU in gram positive or fungi) correlates with infection in most cases [11].

Our study allows us to open new lines of research to perform prospective studies where the effectiveness of empirical treatment is assessed to determine if there is a failure in the established treatment or to know if the population in our region has resistance to first line drugs for this pathology.

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