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## Prevalence of urinary tract infections in diabetic patients

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### Abstract

There is evidence that patients with diabetes have an increased risk of urinary tract infections (UTIs). UTI is the most common bacterial infection in diabetic patients. The study included 500 diabetic patients attended at a private urology clinic in Wasit south east of Iraq between January and December 2017. From the total number of patients, 60 had positive urine cultures (12%). The most frequent bacteria involved in UTI was *Escherichia coli* (70%). We concluded that UTIs are frequent in diabetic patients and urine culture should be performed to give proper antibiotics and to prevent recurrence.

**Keywords:** Urinary tract infections (UTIs); Diabetic patients; Antibiotics

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### Introduction

The prevalence of diabetes mellitus has increased over the past decades. Changes in life style, increasing prevalence of obesity are responsible for this. Diabetes is a common cause of death especially due to its complications. Diabetes is the leading cause of end-stage renal disease. It is generally accepted that UTIs are frequent cause of morbidity and mortality. Incomplete bladder emptying due to autonomic neuropathy and high glucose concentration in the urine allow urinary colonization by microorganisms. There is evidence that patients with diabetes have an increased risk of urinary tract infections (UTIs), UTIs being the most common bacterial infections in diabetic patients. Moreover, it is important to recognize and to treat UTIs in diabetic patients because of their possibly sever complications, including bacteremia, renal abscess, renal papillary necrosis. To treat UTI in diabetics is difficult because of its frequent recurrence, involving greater costs for the medical system and for the patient himself.

The aim of this study was to assess the prevalence of UTI among diabetic patients and to identify the most frequent bacteria responsible for it.

### Materials and Patients

A study was done at a Private Urology Clinic in Wasit south east of Iraq. 500 patients with both type1 and type 2 diabetes attend this clinic from January to December 2017 (260 women and 240 men). Urine culture was performed in 170 patients with a suspected UTI: symptoms suggesting UTI (dysuria, urgency, frequency, supra-pubic pain or tenderness, fever) and urinalysis show more than 5 white blood cell per high power field. We also collected patient's personal history data.

**Results**

We evaluated the frequency of UTI in the diabetic patients of our study group. Out of the total number, 60 patients (12%) had UTI. Regarding the difference between genders, 18.4% of women and 5% of men developed UTI, an extremely significant difference ( $p < 0.0001$ ) (table1).

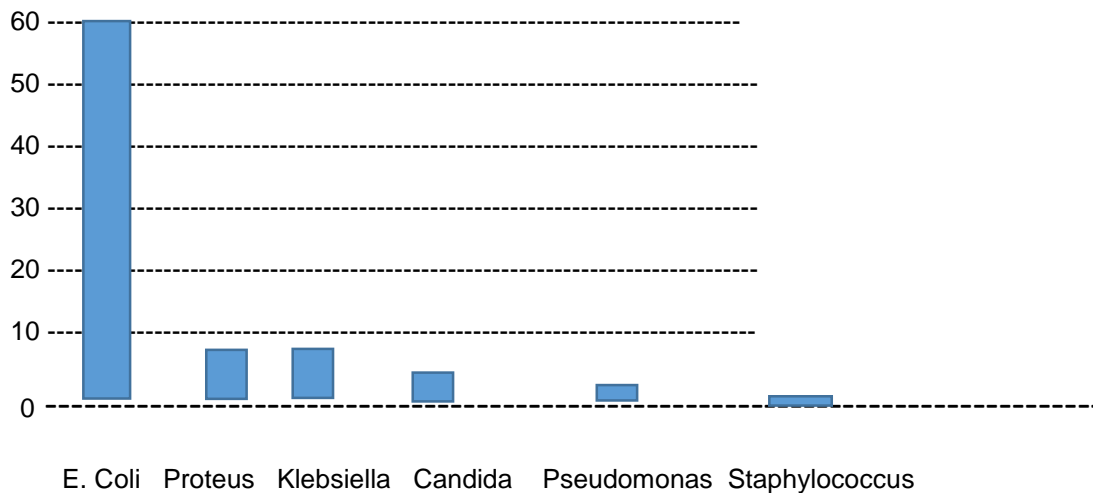
**Table 1.**

The prevalence of UTI by genders

	Women	Men	Total
With UTI	48(18.4%)	12(5%)	60
Without UTI	212(81.6%)	228(95%)	440
Total	260	240	500

The most frequent bacteria involved in UTI, we found that 42(70%) were with E. coli, 6 with proteus species (10%), 6 with Klebsiella species (10%), 3 with candida species ((5%), 2 with Pseudomonas species (3.3%), 1 with Staphylococcus species (1.6%) (figure1).

Distribution of the microorganisms implicated in UTI



## Discussion

The prevalence of UTI among diabetic patients in our study, was 12%, higher in women (18.4%) than in men (5%), results that is similar to the one obtained by Geerlings and coworkers who found a prevalence of 20% in women.

Our study shows that the prevalence of UTI in diabetic patients is three fold higher in women than in men. This important difference can be explained by a variety of men-related factors, such as the greater length of the urethra, the greater distance between the urethral meatus and the anus, and the antibacterial properties of the prostatic fluid.

The bacteria associated with UTI were predominantly *E. coli* (70%) and other Enterobacteriaceae (25%). These findings are similar to those observed by Boyko et al. on 218 diabetic post-menopausal women indicating that the prevalence of *E. coli* was 74.4% and of *Klebsiella* (7%). Another case control study, conducted in New Delhi, India, also found that *E. coli* was the most commonly involved organism (64.3%), followed by *Staphylococcus aureus* (21.4%) and *Klebsiella* species (14.3%).

We found a high prevalence of UTI caused by fungi (*Candida* species). It is known that diabetes is a predisposing factor for fungal infections of the urinary tract. One of the most important explanations for this predisposition is glycosuria.

## Conclusions

UTIs are frequent in patients with diabetes. The most frequent uropathogen is *E. coli*, but fungal infections are also common in diabetic patients, we suggest urine culture for diabetic patient with symptoms of UTI and control of diabetes to prevent recurrence and complications

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