

Urinary Tract Infections Associated with *Candida albicans*

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ABSTRACT

Objectives: *Candida albicans* is an opportunistic fungal pathogen which causes urinary tract candidiasis in humans. In this research, we tried to find out the frequency of the Urinary Tract Infections associated with *Candida albicans* in patients who referred to Central Laboratory of Dr. Shariati Hospital, during 2 years (April 2006- April 2008).

Materials and Methods: According to the archived recorded data, the questionnaires were filled out. At the end of this retrospective research, the statistical tests of Chi Square were operated through SPSS software version 15.

Outcomes: The results showed that, the Urinary Tract Infections associated with *Candida albicans* included 6.8% of patients. The remaining 93.2% of Urinary Tract Infections had related to bacterial pathogens.

Conclusions: The statistical analyses confirmed the significant association between Urinary Tract Infections caused by *Candida albicans* and female gender ($P < 0.05$).

Keywords: *Candida albicans*, urinary tract infections, Candiduria

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OBJECTIVES

Community-acquired Urinary Tract Infections (UTIs) are a frequent problem worldwide which are caused by microbial invasion to different tissues of the urinary tract (1,2). Fungi are a portion of microbial population that may contribute as fungal uropathogens in UTIs. In the last 2.5 decades the fungal UTIs due to *Candida* genus yeast has increased significantly (3,4).

The healthy urinary tract is sterile so, the presence of *Candida* yeasts in the urine implicates a variety of clinical situations (5-7). Candiduria can be demonstrated as symptomatic or asymptomatic UTIs; the incidence of lower urinary tract infections caused by yeasts is four-fold more common in women than in men (5). Furthermore, the results of different studies have indicated that UTIs in women are very common (7-12).

The predisposing factors of UTIs including gender, genetic predisposition, behavioral factors, urologic structural abnormalities, diabetes, immune-suppression, pregnancy, hypertension, stone formation, nosocomial acquired infections and instrumentation like catheterization (7,8,13,14).

The principal aim of the present survey, was to reveal the frequency of the Urinary Tract Infections associated with *Candida albicans* in patients who referred to Central Laboratory of Dr. Shariati Hospital, Tehran-IRAN, during 2 years (April 2006- April 2008). □

MATERIALS AND METHODS

In this 2-year surveillance, 4136 patients with or without clinical symptoms of UTIs who referred to the Central Laboratory of Dr. Shariati Hospital (April 2006- April 2008) were considered (7,8,15).

Through the archived documents at the Central Laboratory of hospital, the questionnaires (including pathogenic agent (*Candida albicans*), diagnostic techniques, gender, age, predisposing factors and if applicable, mortality) were filled out (7,8).

According to bioethical limitations, the names of patients were completely anonymous for the authors.

Eventually, the percentage of candiduria was calculated and by the help of SPSS version 15 (SPSS Inc., Chicago, IL, USA), the Chi

Square (χ^2) test was analyzed to prove the probable association between gender of patients and candiduria. The <0.05 was chosen for p value as the statistically significant. □

OUTCOMES

The results indicated that from 4136 (100%) patients who were involved, 1557 (37.6%) of patients were men and the remaining 2579 (62.4%) were women. The frequency of candiduria caused by *Candida albicans* was 283 (6.8%) from the total cases of 4136.

Moreover, 123 (43.5%) patients suffering from candiduria were men and the remaining 160 (56.5%) included women. So, the rest of patients who included 3853 (93.2%) persons were suffering from bacteriuria.

To be considered urinary yeast infection, the yeast was identified according to different characteristics such as their macroscopic, microscopic and physiological properties.

The samples were cultured on blood agar. After macroscopic and microscopic observation of yeast cells; for confirming the species of *Candida albicans*, the samples were transferred into human serum for 3 hours to grow the germ tubes. The observation of germ tubes in *Candida* yeast cells was the most important physiological property to report the yeast cells as *Candida albicans*.

The items including neither age of patients nor the risk factors for individuals were recorded; therefore, the missing items were excluded from this research (7,8). However, catheterization, surgical instrumentation and diabetes were reported for candiduria in men as the most important predisposing factors. In the recorded data, no mortality was reported. □

DISCUSSION AND CONCLUSIONS

The recent studies have shown that, because of prolonged hospitalization, immunocompromised patients, uncontrolled use of antibiotics, prophylaxis by antifungal agents, catheterization, urinary tract surgeries and long period stays in intensive care units, the frequent of funguria and specially uropathogenic yeasts getting increased. The most important uropathogen causing candiduria is *Candida albicans* (3,16-19).

The results of studies indicate that, *Candida albicans* is the causative fungus for 50% to 70% of all candiduria isolates (3,16,20,21).

The results of different international studies have shown that *Candida albicans* is still the most common isolated species (3,22-24).

In our previous 1-year study, the prevalence of UTIs associated with *Candida albicans* included 5.9% of microbial UTIs (31.7% of candiduria were seen in men and 68.3% in women) (7) while in our present 2-year study, the incidence of UTIs associated with *Candida albicans* included 6.8% of microbial UTIs (43.5%

of candiduria were seen in men and 56.5% in women). In addition the statistical examinations of χ^2 revealed a significant association between female gender and UTIs caused by *Candida albicans* ($p < 0.05$). The authors of the present investigation believe that, these kinds of surveillances must be performed at regular intervals to follow any changes in the causative fungal uropathogens. □

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