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Investigation of risk factors and antifungal susceptibility in urinary *Candida* infections

S. Karakadioglu¹, C.B. Cetin¹, K. Degerli², S. Senol¹, O. Tunger¹

¹Infectious Disease and Clinical Microbiology, Celal Bayar University, Manisa, Turkey ; ²Microbiology and Clinical Microbiology, Celal Bayar University, Manisa, Turkey

Objective: In recent years, hospitalization rate is increased due to severe underlying disease and surgical interventions. In hospitals, particularly in intensive care units, because of increase in usage of longer duration and multiple antibiotics, immunosuppressive therapies, central venous catheters and total parenteral nutrition, urinary fungal infections become an important problem.

Methods: Patients who were over 18 years old and hospitalized at Celal Bayar University Hospital between January 2012 and March 2013 were included into the study. Antifungal susceptibilities of *Candida* species isolated from urine cultures were examined by E-test.

Results: The ages ranging from 18 to 88 (mean: 60.21 ± 17.57) and 56 female and 44 male patients constituted the study group. The mean period from the admission of patients to the development of candiduria was found 23.9 days. Of the patients, 65% were followed in intensive care units, and 35% were in other clinical departments. The mostly encountered risk factors in patients were detected as use of antibiotics (99%), at least one underlying chronic disease (94%), and presence of urinary catheter (90%). Other risk factors were, respectively, total parenteral nutrition (45%), central venous catheter (39%), mechanical ventilation (38%), urinary tract abnormalities (34%), diabetes mellitus (33%), malignancy (32%), surgical operation (27%), chronic renal failure (23%), hemodialysis (14%), immunosuppressive therapy (12%), steroid use (10%), head trauma (9%) and nephrostomy (6%). Clinical outcomes of the participating patients had been followed, and 58% of these patients were resulted with mortality. A significant relationship was found between mortality and hospitalization in intensive care unit, having a central venous catheter, total parenteral nutrition, mechanical ventilation, hypothermia, tachycardia, hypotension, deteriorated general condition, and concomitant candidemia ($p < 0.05$, Fisher's exact χ^2 test). There was no independent risk factors detected in multivariate statistical analysis. In 46 of the patients *C. albicans*, whereas in 54 patients *non-albicans Candida* species were isolated. There was no statistically significant difference according to *Candida* species in the rates of mortality. Resistance to amphotericin B, caspofungin and voriconazole was detected in neither groups. There was no resistance determined for *C. albicans* strains to fluconazole and 4.3% of these strains had dose-dependent susceptibilities. 20.3% strains of *non-albicans Candida* species had dose-dependent susceptibilities and 5.6% of them were resistant to fluconazole. When itraconazole resistance was evaluated; 17.4% of *C. albicans* strains had dose-dependent susceptibilities, while 6.5% were resistant. In *non-albicans* strains; 26% were resistant to itraconazole and 13% of them had dose-dependent susceptibilities.

Conclusion: As a result, urinary fungal infections have to be thought when an infection is determined in patients with various risk factors and longer duration of antibiotic use and appropriate diagnosis and treatment interventions should be started.