

Escherichia coli-associated factors in patients with recurrent urinary tract infections in Semnan, Iran: first report of O25b-ST131clone

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Introduction and objectives: This study describes emergence of ST131 Escherichia coli (E. coli) clone in hospitalized patients with recurrent urinary tract infection (RUTI) in Semnan city, Iran for the first time. Bacterial contributing factors which may drive recurrences in patients like antibiotic resistance, phylogenetic groups and virulence factors of isolates were also investigated and compared between the two reinfection and persistence groups of RUTI isolates. **Materials and methods:** We grouped the isolates into reinfection or persistence based on ERIC-PCR method. The term “reinfection” used when a strain showed different pattern of ERIC from the original strain in the first exposure while “persistence” defined as the re-occurrence of an identical ERIC type of strains through two consecutive attacks.

Results: We detected 2 separate phases of ST131 E. coli found in 10/24 RUTI patients who hospitalized in internal and/or internal ICU wards. Among 61 RUTI E. coli isolates, 24 (39.3%) and 37 (60.6%) belonged to reinfection and persistence groups, respectively. The resistance rate against trimethoprim/sulfamethoxazole and levofloxacin was significantly higher among persistence isolates. The prevalence of ESBL genes in persistence group was higher in comparison with reinfection group. The prevalence of iuta (47, 77%) and kpsmtII (30, 49.2%) was predominant among 61 RUTI isolates. Phylogroup B2 showed significantly higher rates of adhesin than non B2 isolates. Fourteen (58.3%) isolates belonged to O25b-ST131 clone in which all harbored CTX-M-15 except for one. fimH30 subset was detected in 11/14 O25b-ST131 isolates. Among O25b-ST131 isolates, virotype C was the most prevalent virotype (11, 73.3%). **Conclusions:** To our knowledge, this is the first report of ST131 E. coli outbreak in Iran. We found two separate phases of ST131 E. coli outbreak in internal and/or internal ICU wards of a teaching hospital. Contaminated environment and contact with colonized patients involved in dissemination of this clone. We also found that resistance against trimethoprim/sulfamethoxazole and levofloxacin with exclusive activity in UTIs can facilitate the development of persistence isolates.

Keywords: O25b-ST131 Escherichia coli, recurrent urinary tract infection, phylogenetic groups, virulence factors, Iran