Characterization of extraintestinal pathogenic E.coli (ExPEC) sequence type 131and it's H30 and H30-Rx subclones from Semnan province: first report of OXA-48 producing ST131 clone

Zoya Hojabri[1], Majid Mirmohammadkhani[2], Omid Pajand[1]*

1. Microbiology Department, Faculty of Medicine, Semnan University of Medical Sciences, Semnan, Iran

2.Social Determinants of Health Research Center, Semnan University of Medical Sciences, Semnan, Iran

Abstract In view of the epidemiological success of ESBL producing lineages of E.coli and particularly of ST131, it is of significant interest to explore its prevalence in countries such as Iran and to determine clonal subgroup O16-ST131 and the H30 and H30-Rx subclones, antibiotic resistance, virulence and genetic architecture of this high risk clone. The ST131 clonal group accounted for 63(29.8%) of the 211 phylogroups B2, D and F selected isolates obtained from clinical samples in a tertiary care hospital. Fifty-seven (90.4%) and six (9.6%) of the ST131 isolates belonged to serogroups O25b and O16, respectively. O25b-ST131 and O16-ST131 isolates exhibited high rates of multidrug resistance (98.4% and 83.3%) and ESBL production (96.8% and 83.3%). The majority (56/57, 98.2%) of O25b isolates belonged to H30 subclone, and 24 of 56 H30 isolates belonged to H30-Rx subclone. Six O16-ST131 isolates were H30 negative. Among H30 isolates, H30-Rx subclone showed higher resistance score and was associated with CTX-M group 1 in comparison with non-Rx isolates. All the ST131 isolates except one O16 strain showed the ExPEC status. OXA-48 carbapenemase detected in eight isolates, including seven O25b and one O16, of which one O25b-ST131 isolate detected as carbapenem susceptible. The ST131 isolates comprised 15 ERIC clusters and O16 isolates remained distributed in 5 groups in cluster with O25b-ST131 isolates.

In conclusion, this is the first report for the presence of MDR, CTX-M-positive O25b/O16-ST131 isolates in Iran. Despite the lower prevalence and virulence traits of O16-ST131 compared to O25b-ST131, higher resistance rates to β-lactam antibiotics may indicate the importance of this subgroup in the spread of MDR *Ecoli* isolates.

Key words:extraintestinal pathogenic E.coli, ST131 clone, Semnan province