

## #1980 - Diversity in MDR and ESBL patterns of *E. coli* isolates recovered in acute and recurrent episodes of urinary tract infection in patients with different genders and ages

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### Body

**Introduction:** Urinary tract infection (UTI) is the second common bacterial infection worldwide, affecting mostly women between 20 and 56 years of age. Either in its acute or recurrent episode, uropathogen *Escherichia coli* (UPEC) is the main causative bacteria. However, the multi-drug resistant (MDR) and/or extended-spectrum beta-lactamase-(ESBL-) producing UPECs and their patterns of resistance may vary in men and women at different ages.

The aim of this study was to evaluate the UPEC isolates recovered from acute and recurrent phases of urinary tract infection in the same patients, and to investigate their MDR and ESBL patterns differences based on gender and age period.

**Method:** The urine samples of out-/in-patients suffering from UTI in Loghman Hakim and Imam Khomeini hospitals were collected and they were under supervision for any probable recurrence during 1 year. Then, isolates were collected from urine samples and subjected for differential cultures to select the *E. coli* isolates, and antibiotic susceptibility test using disk diffusion method was performed for each of them. MDR was defined based on a proposal published by a group of international expert from

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the European Centre for Disease Prevention and Control and the Centers for Disease Control and Prevention in 2012. ESBL pattern was tested and defined according to the Performance Standards for Antimicrobial Susceptibility testing published by the Clinical and Laboratory Standards Institute in 2018.

**Results:** 170 *E. coli* isolates were recovered from the urine of 78 patients having both acute and recurrent phases of UTI (some patients had more than one recurrence phase). As expected, the number of the female patients was 2.2 times more than males (45 vs. 24). Around 40% of the *E. coli* isolates were MDR, and 46% of them showed ESBL pattern. Interestingly, the MDR and ESBL patterns were seen more in males than females (53.1% vs. 34.2% for MDR, and 53.1% vs. 43.3% for ESBL respectively), and in recurrent UTI than acute phase (44.6% vs. 33.3% for MDR, and 47.8% vs. 42.3% for ESBL respectively). Meanwhile, there was a correlation between the percentages of the MDR isolates and the patients' ages (31.4% in children and young adults, 34.7% in adults, 48.2% in seniors). However, such a correlation was not detected in the case of the ESBL-producing isolates. Moreover, while in children and young adults, the MDR isolates were seen more in girls than boys, in adults and seniors the ratio was reverse. The similar scenario was observed in ESBL group as well.

**Conclusion:** It seems that as patients age increase (especially in men), isolates with more resistance to antibiotics are needed to infect patients and cause UTI. This seems to be true in the case of recurrent UTI. Although there are some usual explanations such as indiscriminate use of antibiotics and anatomic differences of two genders, but more concerns are needed. Meanwhile, this diversity in the patterns might be considered in antibiotic treatment regimens.

### References

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