

# Extended spectrum $\beta$ -lactamases in Enterobacteriaceae in Tehran, Iran: a preliminary study

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## Abstract

**Introduction:** Bacteria-producing extended spectrum beta-lactamases (ESBLs) are identified in the clinical laboratory by their resistance to third generation cephalosporins and susceptibility to beta-lactamase inhibitor compounds such as clavulanic acid. Many clinical laboratories (as well as medical community) in Iran are not fully aware of the importance of ESBLs and how to detect them. The aim of this study was to determine frequency of ESBL-producing organisms among Enterobacteriaceae. **Materials and Methods:** During October and December 2002, 173 isolates of Enterobacteriaceae were collected from patients with urinary tract infection in a university hospital. Antimicrobial susceptibility to ceftazidime, cefotaxime, amoxicillin-clavulanic acid, and other antibiotics determined by the disk diffusion method outlined by the National Committee for Clinical Laboratory Standard (NCCLS). Double-disk synergy tests were applied by placing disks of ceftazidime/cefotaxime at 20 mm from a disk containing amoxicillin-clavulanic acid. Any enhancement of the zone of inhibition between a cephalosporin disk and that containing the beta-lactamase inhibitor was indicative of the presence of an ESBL. **Results:** Of 173 patients, 60% were females and 40% males. *Escherichia coli* (60%) was the most common isolated organisms followed by *Klebsiella spp* (25%). Frequency of Enterobacteriaceae resistance to ceftazidime, cefotaxime, and amoxicillin-clavulanic acid was 23%, 28%, and 26%, respectively. In this study 17 of 173 isolates were producers of ESBLs (9.8%) (CI 95%: 6%-15%). Eleven of 17 ESBL-producing organisms were *Klebsiella spp*. (64.7%) (nine *K. pneumonia* and two *K. oxytoca*) and the remaining of six isolates were *E. coli* (35.3%). **Conclusions:** In this study about 10% of *Enterobacteriaceae* were ESBL-producers. Microbiological surveillance on ESBLs could play a major role in establishing more an effective antibiotics policies. Thus therapeutic failures by cephalosporins in infections caused by ESBL-producing organisms could be avoidable by using of amoxicillin-clavulanic acid. Therefore, the high costs of treatment would be much less. Overall it is necessary for clinicians and medical community to be fully aware of ESBL-producing organisms.