EMERGENCE OF A NEW GROUP CTX-M ENZYME IN ROMANIA AND RISK FACTORS FOR EXTENDED SPECTRUM BETA-LACTAMASES PRODUCING E. COLI INFECTIONS

Egidia Miftode¹, Olivia Dorneanu², Aida Badescu², Laura Ghibu¹, Daniela Leca¹, Teodora Vremera², Ana Mereuţă²
University of Medicine and Pharmacy“Grigore T. Popa” - Iasi
Faculty of Medicine
1. Department of Infectious Diseases
2. Department of Microbiology

EMERGENCE OF A NEW GROUP CTX-M ENZYME IN ROMANIA AND RISK FACTORS FOR EXTENDED SPECTRUM BETA-LACTAMASES PRODUCING E. COLI INFECTIONS (Abstract): Antibiotic resistance rates in E. coli are rapidly rising, with worrisome aspects especially regarding community-acquired resistance to third- and fourth-generation cephalosporins and fluoroquinolones. The objectives of this prospective cohort study was to determine the resistance profile of E. coli for two categories of patients (<49 years and ≥ 50 years), risk factors for ESBL positivity and to investigate the molecular epidemiology of ESBL type CTX-M enzymes. A total of 885 strains of E. coli were isolated in the Infectious Diseases Hospital laboratory between June 2008 and June 2011 and E. coli resistance due to ESBL production was noted in 17% of cases. We found that previous therapy with cephalosporins, hospitalization and urinary catheter were risk factors for ESBL positivity. We noted significant differences concerning resistance rate between patients under 49 years and aged more than 50 years for ciprofloxacin (19% and 38%, respectively, p=0.0001), for gentamicin (15% and 23%, p=0.008), ceftazidime (15% and 24%, p=0.001) and ESBL positivity (14% and 20%, p=0.009). This study highlights the predominance of CTX-M producing strains (92.5% of ESBLs-positive E. coli harboured bla CTX-M genes); CTX-M-15 producing isolates were the most common, accounting for 96 % of isolates. Only 4% were belonging to CTX-M group-9, an emerging ESBL group which is newly described in Romania. **Key words:** ESCHERICHIA COLI, RESISTANCE, CTX-M ENZYMES

A problem of global magnitude is represented by the dissemination of Gram-negative bacteria genes which codify extended-spectrum β-lactamase (ESBLs), enzymes of particular clinical and epidemiological interest that can rapidly hydrolyse, or confer resistance to oxyiminocephalosporins (extended spectrum cephalosporins and monobactams) but not carbapenems.

The emergence of extended-spectrum β-lactamases (ESBL)-producing strains mainly with CTX-M-type enzymes in the community, is an alarming phenomenon that could have major implications for antimicrobial therapy (1, 2, 3).

A lot of reports confirmed that CTX-M (frequently CTX-M-15) are associated with an important number of mobile resistance genes and that these genes have the ability to disseminate between different strains of