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Poster Session IV

Resistance in Enterobacteriaceae

STRAINS BELONGING TO CLONAL GROUP O25B:H4-ST131 ARE WIDELY DISSEMINATED AMONG CTX-M-15 PRODUCING ESCHERICHIA COLI RECOVERED FROM IN- AND OUTPATIENTS IN GERMANY, 2010

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Objectives: Clonal group O25b:H4-ST131 strains of *Escherichia coli* (ECO) associated with CTX-M-15 extended-spectrum-beta-lactamase (ESBL) production possess numerous virulence determinants and have been reported as a major public health concern worldwide. To our knowledge, data on the occurrence of these isolates in Germany are scarce. The objective of this study was to evaluate the prevalence of CTX-M-15 producing strains belonging to the clonal group O25b:H4-ST131 among ECO isolates recovered from in- and outpatients in Germany.

Methods: 505 ECO (diverse specimens) from hospitalized patients and 499 ECO (urine isolates only) from outpatients, were collected from 43 medical microbiology laboratories during a resistance surveillance study conducted by the Paul Ehrlich Society for Chemotherapy in 2010. Susceptibility of strains was tested for a panel of antibiotics according to the standard ISO 20776-1 and interpreted by EUCAST criteria (v3.1). ESBL-producing ECO were confirmed according to the broth dilution procedure as described by the CLSI. Isolates with an ESBL phenotype were further characterized by PCR amplification and sequencing of *bla* genes using specific primers for the CTX-M-, TEM- and SHV-type. Isolates harbouring a CTX-M-15 ESBL were further screened by PCR for the presence of the *rfbO25b* gene that is associated with the clonal group O25b:H4-ST131.

Results: Of the isolates from in- and outpatients, 91 (18%) and 40 (8%) were ESBL producers, respectively. CTX-M ESBLs were present in 39 (97.5%) ESBL-producing isolates from outpatients and 84 out of the 91 (92.3%) ESBL-producing isolates from inpatients. A single clinical isolate harboured the new variant CTX-M-143 that differed from CTX-M-15 in only one amino acid substitution (Asn173Ser). The ESBL type CTX-M-15 was identified in 44 out of the 91 (48.4%) hospital isolates and 27 out of the 40 (67.5%) community isolates. The *rfbO25b* gene was found in 47.7% (21/44) and 70.4% (19/27) of *bla*_{CTX-M-15} strains isolated from inpatients and outpatients, respectively. All 21 hospital isolates of clonal group O25b:H4-ST131-CTX-M-15 were non-susceptible to fluoroquinolones (FQ) and 3rd generation cephalosporins (3GC), while 38.1%, 52.4%, 57.1%, 95.2%, 100% and 100% were susceptible to aminoglycosides, piperacillin/tazobactam, co-trimoxazole (SXT), fosfomycin (FOS), colistin, and carbapenems, respectively. Of the 19 outpatient isolates belonging to O25b:H4-ST131-CTX-M-15, all were non-susceptible to FQ and 3GC, while susceptibility rates were 15.8%, 94.7%, and 100% for SXT, FOS and nitrofurantoin, respectively.

Conclusions: Strains belonging to clonal group O25b:H4-ST131 are widely disseminated among CTX-M-15-producing ECO recovered from in- and outpatients in Germany.