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Abstract (poster session)

Regional dissemination of an IS911-mediated blaAmpC-hyperexpressing Escherichia coli ST131 clone

C. Ramberg, D.H. Skutlaberg, C.G. Giske, A. Sundsfjord, Ø. Samuelsen* (Tromsø, Bergen, NO; Solna, SE)

Objectives: To investigate a possible regional dissemination of clonally related ST131 E. coli isolates hyperexpressing the chromosomal AmpC beta-lactamase. Materials and Methods: Two strain collections of E. coli isolates with an AmpC-phenotype profile, submitted to the National Reference Centre for Detection of Antimicrobial Resistance from 2006-2010 were analysed in this study: (i) 111 E. coli isolates submitted from Haukeland University Hospital (HUH) and (ii) a nationwide collection of 100 E. coli isolates from other laboratories. All isolates were tested negative by PCR for plasmid-mediated AmpC genes, and were phenotypically ESBL-negative. Antimicrobial susceptibility testing was performed by Etest. Genotypic characterization was done by multilocus sequence typing, pabB-PCR to screen for isolates belonging to sequence type (ST)131, and PCR and sequencing for detection of insertions in the blaAmpC upstream region. Clinical data were collected retrospectively. Results: Forty seven out of the 111 isolates (42%) from HUH were positive for an IS911 element upstream of blaAmpC. Further, 46/47 of IS911 positive isolates were identified as ST131. A single ST978 strain was detected. None of the other 64 HUH isolates had an insertion upstream blaAmpC. In contrast, only 3 isolates from the nationwide collection had an insertion upstream blaAmpC, all harbouring the insertion of IS10. The IS10-positive isolates were typed to ST23 and ST405 (n=2). Among the IS911-negative HUH isolates and in the nationwide collection, 11/64 and 9/100 isolates were ST131, respectively. The 47 IS911-AmpC-positive HUH isolates were isolated from 40 patients. In 7 patients > 2 isolates were obtained with the longest time period between isolations of ~11 months indicating long term colonization. The 46 IS911-AmpC-positive ST131 HUH isolates were from urine (n=44) or blood (n=2). The patient age range for the IS911-AmpC-positive ST131 HUH isolates was 58-97 years (mean 84 years) and 79% of the patients were females. All IS911-AmpC-positive ST131 HUH isolates showed co-resistance to ciprofloxacin, a characteristic of ST131 and 89% were resistant to gentamicin. Conclusion: We have shown a regional clonal dissemination of an ESBL-negative ciprofloxacin resistant E. coli ST131 clone hyperexpressing the chromosomal AmpC induced by an IS911 insertion.