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Abstract (publication only)

Commonality among CTX-M-15-producing ST131-O25b uropathogenic Escherichia coli isolates from companion animals and humans in Portugal

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Objectives: To assess similarities by PFGE analysis of E. coli isolates from the sequence type 131 serotype O25-variant b worldwide pandemic clone among companion animal and human urinary tract infection in Portugal and its association with fluoroquinolone-resistance and ESBL production. Methods: All isolates were previously identified as ST131-O25b by PCR. The veterinary community E. coli isolates (n=44, 36 from dogs and 8 from cats), were collected from 2004 until 2009 at the Veterinary Teaching Hospital of the FVM and at private practices in the Lisbon area. Human strains (n=41) were isolated in hospitals and in a community Diagnostic Laboratory in the Lisbon area, during 2005 and 2006. Of these, 15 were from hospitalized and 26 from ambulatory patients. The subset of ST131-O25b isolates underwent susceptibility testing by disk diffusion, ESBL phenotyping and genotyping and PFGE analysis. PFGE digital images were analyzed using Bionumerics software version 6.6. Similarities were calculated using the Dice coefficient, with 0.5% optimization, a maximum position tolerance of 1.0%, and clustered by UPGMA. Results: Thirteen (31.7%) ST131 human isolates were CTX-M-15 beta-lactamase producers (7 E. coli isolates from community-associated UTI and 6 from hospitalized patients). Five (11%) CTX-M producer E. coli isolates were isolated from 3 dogs (2 CTX-M-15 and 1 CTX-M-32) and 2 cats respectively (1 CTX-M-15 and 1 CTX-M-32). All human and animal ESBL-producer isolates were also ciprofloxacin-resistant. The ESBL-producer isolates also harboured simultaneously the blaTEM and blaOXA-1 genes (9 human and 2 animal isolates). PFGE analysis showed 100% similarity between one human nosocomial and a dog community both CTX-M-15-producer isolates and these clustered (>85% similarity) with 2 other human nosocomial and cat CTX-M-15-producer isolates. Conclusions: We had previously demonstrated that the ST131-O25b pandemic E.coli clone is a prevalent clone in the Lisbon area in Portugal and that the majority of these isolates lack ESBL genes. Nevertheless, the present study shows the similarity of CTX-M-15-producer E.coli ST131-O25b clone across host species. Our findings confirm that the transfer of resistance markers and resistance isolates between animals and owners/caretakers is a strong possibility either by infection or direct contact. Companion animals may play an important role in the dissemination of the ST131-O25b pandemic E. coli clone in the community.