

ABSTRACT

Over recent decades, nosocomial infections by *E. aerogenes* and members of the *E. cloacae* complex have taken great importance. For treatment, fluoroquinolones, cephalosporins and carbapenems are significant options. However, antimicrobial resistance has increased, and treatment failure has been associated to production of plasmid-mediated quinolone resistance (PMQR) determinants, extended-spectrum β -lactamases (ESBL) and carbapenemases. In this study, we analyzed 42 isolates belonging to the *E. cloacae* complex and 6 *E. aerogenes* from 48 patients admitted to a tertiary hospital in the São José do Rio Preto – SP, between January 2013 and May 2014. An automated system was used for species identification and antimicrobial susceptibility tests. The presence of genes codifying carbapenemases, ESBL and PMQR was evaluated by PCR. The ESBL genes were sequenced and the BLAST program was used for identification. For confirmation of variant *aac(6')Ib-cr*, the restriction enzyme BseGI was used. Among the 48 isolates, 98% presented resistance to ertapenem, 27% imipenem and meropenem, 100% to ceftriaxone and ceftazidime, 85% to cefepime and 73% to ciprofloxacin. Isolates originated from urine (56%), tracheal aspirate (19%), biopsy fragments (10%), blood (8%) and other biological samples (7%). The majority of patients (73%) were admitted to Intensive Care Units. The *bla*_{KPC} gene was detected in 23% of the isolates, specifically in 5 *E. aerogenes* and 6 *E. cloacae* complex. Regarding PMQR and ESBL genes, most were detected in *E. cloacae* complex. The *bla*_{CTX-M-15} was found in 42%, *bla*_{CTX-M-2} in 23%, *bla*_{CTX-M-8} in 2% and *bla*_{CTX-M-59} in 2%. The most prevalent PMQR gene was *aac(6')Ib-cr*, detected in 25% of the isolates, followed by *qnrB* in 13% and *qnrS* in 2%. The association *aac(6')Ib-cr*+ *qnrB* was observed in 31% of the isolates, and 29% lack PMQR genes. One *E. aerogenes*, isolated from a transplanted patient, harboured *bla*_{CTX-M-59} and *qnrS* genes. The *bla*_{CTX-M-15}+*qnrB*+*aac(6')Ib-cr* association was found in 34% of the isolates, *bla*_{CTX-M-15}+*aac(6')Ib-cr* in 12% and 5% of *bla*_{KPC}+*bla*_{CTX-M-15}+*aac(6')Ib-cr*. In this study, *bla*_{CTX-M-15} and *aac(6')Ib-cr* are the most common resistant genes in the *E. cloacae* complex, while in *E. aerogenes* *bla*_{KPC} prevails. The association of various resistance genes may be considered result of horizontal transfer and demonstrates the rapid bacterial evolution in the hospital environment.

Keywords: ESBL, Carbapenemase, *Enterobacter* spp, PMQR.