TITLE: SURVEILLANCE OF CARBAPENEM-RESISTANT *Enterobacteriaceae* IN PATIENTS DURING HOSPITALIZATION IN AN ADULT INTENSIVE CARE UNIT

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ABSTRACT:

Healthcare-associated infections caused by carbapenem-resistant *Enterobacteriaceae* (CRE) or extended spectrum b-lactamase-producing *Enterobacteriaceae* (ESBLEn) have become a worldwide problem. The objective of this study was to monitor the evolution of resistance to carbapenems (CAR) and Cephalosporins (CEP) in *Enterobacteriaceae* recovered from inpatients at an adult intensive care unit (ICU-A) at a University Hospital in Southern Brazil. Twenty-two patients who remained hospitalized in the A-ICU for more than 10 days in the period from 2011 to 2014 were included. The identification and the antimicrobial susceptibility test were performed by Phoenix BD™ automated system. All isolates were investigated for the presence of carbapenemase genes (*bla* $_{\text{OXA-48}}$, *bla*$_{\text{NDM}}$ and *bla*$_{\text{KPC}}$) and ESBL (*bla* $_{\text{CTX-M}}$, *bla*$_{\text{SHV}}$, *bla*$_{\text{GES}}$ and *bla*PER) by the multiplex polymerase chain reaction. Seventy-five *Enterobacteriaceae* isolates (28 *Klebsiella pneumoniae*, 21 *Enterobacter cloacae*, 7 *Escherichia coli*, 6 *Proteus mirabilis*, 5 *Klebsiella oxytoca*, 4 *Serratia marcescens* and 4 *Citrobacter* spp.) were recovered. All isolates were resistant to cephalosporin. In 14 patients no change in the CAR susceptibility or presence of betalactamase genes were verified. Isolates of 3 patients were acquired CTX-M and OXA-48 genes during hospitalization. In 5 patients the isolates were initially sensitive to CAR and during the hospitalization they became resistant. Two of them the increase of resistance was not associated with the presence of genes carbapenemases, but by acquisition of the gene *bla*$_{\text{CTX-M}}$ which added to the porin loss probably influenced the resistance. In the other 3 patients the first isolates were sensitive to CAR with the presence of the *bla*$_{\text{CTX-M}}$ and bla $_{\text{OXA-48}}$ and become resistant over time. None genes of *bla*$_{\text{KPC}}$ and *bla*$_{\text{NDM}}$ were detected on isolates evaluated. The results demonstrate that during the stay of the patients in the ICU *Enterobacteriaceae* isolates could acquire or express genes leading to resistance to CAR or CEP. These data indicate the importance of epidemiological surveillance of CRE and ESBLEn the adoption measures in the control of these microorganisms.

Keywords: *Enterobacteriaceae*, carbapenem-resistant, surveillance, patient, Adult Intensive Care Unit

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