

TITLE: Evaluation of the general susceptibility profile from community and nosocomial gram negative bacilli from Uruguaiiana / RS

AUTHORS: De Paula, J.R.¹; Bitencourt, C.¹; Saldanha, L.S.¹; Giacomini L.Q.¹; Siqueira, R.H.R.²; Silveira, I. D.², Ribeiro, V.B.¹

INSTITUTION: 1. Universidade Federal do Pampa, Campus Uruguaiiana, Uruguaiiana, RS (BR 472, Km 592, CEP, Uruguaiiana – 97508-000, RS; Brazil) 2. Biosul Análises Clínicas, Uruguaiiana, RS (Rua 13 de Maio 2379, CEP 97500-600, Uruguaiiana – RS; Brazil)

ABSTRACT

Gram negative bacilli (BGN) are considered important cause of community and hospital infections. The frequency of multiresistant strains among Enterobacteriaceae and non-fermenting BGN has increased considerably in last decades and outbreaks related to these microorganisms have been commonly described in Brazil and even in Rio Grande do Sul. However, epidemiological data from the interior of the state are extremely scarce. Thus, the objective of the present study was to investigate the susceptibility profile of gram negative isolates from a clinical laboratory from Uruguaiiana (RS), which attends the community in general and also the only hospital of the city. The susceptibility test by disk-diffusion of all positive cultures between October 2016 and June 2017 were sent to the laboratory of Microbiology of Unipampa. The isolates susceptibility profile (SP) was interpreted according to the guidelines of the Brazilian Committee for Antimicrobial Susceptibility Testing (BRCAST). For the isolates with reduced susceptibility to carbapenems, phenotypic screening with beta-lactamase inhibitors (boronic acid (AB) and EDTA) was performed. The isolates that presented positive results for AB were investigated for the presence of the blaKPC gene and those positive for EDTA were investigated for the blaVIM and blaNDM genes. During this period, 338 isolates were received, of which 283 (83.7%) were gram-negative bacilli. The most prevalent isolate was *E. coli* (67.1%), predominantly from community urine samples (93%). The SP was greater than 89% for second and third generation cephalosporins, 85.3% for gentamicin (GEN) and less than 72% for ciprofloxacin (CIP) and sulfamethoxazole-trimethoprim (SUT). Nosocomial strains which were tested against carbapenems (32) and amikacin (29) resulted in a susceptibility of 96.9% and 89.6%, respectively. Urine was also the predominant specimen in the infections caused by *Klebsiella* spp., which was identified in 36 cultures, of which 66.7% were identified in the hospital. Susceptibility to cephalosporins ranged from 50-60%. To carbapenems, aminoglycosides and SUT it was not higher than 87.5%, 78.8% and 64%, respectively. Seventy percent of hospital strains were resistant to CIP. Of the 21 isolates of *Pseudomonas* spp., 85.6% were isolated in the hospital, predominantly of respiratory tract and blood. Susceptibility to cephalosporins, carbapenems, aminoglycosides and CIP did not exceed 66.6%, 83%, 80% and 50%, respectively. All the 15 *Acinetobacter* isolates were identified at hospital, of which 53% were from tracheal aspirate. All of them were resistant to ampicillin-sulbactam, 78.6% were resistant to CIP and 71.4% to GEN. Resistance to carbapenems was 86.7%. Of a total of 26 resistant isolates or with reduced sensitivity to carbapenems, two enterobacteria presented a positive phenotypic test in the presence of AB and confirmed the presence of KPC by PCR; and in the presence of EDTA 10 isolates tested positive: four enterobacteria and 11 non-fermenting BGN. Two isolates (*E. coli* and *Pseudomonas* spp.) confirmed the presence of the blaVIM gene. Other genes of metallo beta-lactamases, as well as oxacillinases, need to be evaluated for a more complete investigation of the mechanisms involved in resistance to carbapenems, mainly in *Acinetobacter* spp. However, the presence of carbapenemases in some of our isolates evidences the importance of epidemiological studies in the interior of the state, demonstrating that the emergence of resistance to carbapenems in BGN is not a problem restricted to largest cities and capitals and deserves the attention from professionals and health institutions.