TITLE: HIGH FREQUENCY OF METALLO-β-LACTAMASE ENCODING blaVIM GENE AMONG GRAM-NEGATIVE BACTERIA IN A GENERAL HOSPITAL IN JOINVILLE, SOUTHERN BRAZIL

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ABSTRACT

Bacterial metallo-β-lactamases (MβL) are widely distributed enzymes associated with high mortality and morbidity rates in Healthcare-Associated Infections worldwide. The Verona Integron-Encoded Metallo-β-lactamase (VIM) family, the largest group within the B1 subgroup of MβL, presents high prevalence in Europe, Asia-Pacific and Middle East Africa, with sporadic cases reported in Brazil. Our aim was to investigate the frequency of blaVIM gene among Gram-negative bacteria (GNB) resistant to carbapenems isolated from clinical samples. There were evaluated 157 clinical isolates collected during 9 consecutive years in a general hospital in Southern Brazil. Identification of the species was performed by automated method and the evaluation of antibiotic susceptibility by disc-diffusion in agar. The blaVIM was investigated by polymerase chain reaction. The isolates analyzed were derived from bronchoalveolar lavage (31%, n = 48), rectal swab (20%, n = 32), wound secretion (15%, n = 24), urine (14%; n = 22), blood (6%, n = 9) and other less frequent sample types (14%, n = 22). The majority of isolates were derived from the Intensive Care Unit (41%; n = 65), followed by the hospitalization units (37%; n = 58). Acinetobacter calcoaceticus - Acinetobacter baumannii complex (ABC) strains comprised the majority of isolates (46%, n = 72), followed by Pseudomonas aeruginosa (27%, n = 43), Klebsiella pneumoniae (20%, n = 31), Enterobacter cloacae (4%, n = 7) and 4 (3%) isolates distributed in species with less frequency. The presence of blaVIM was observed in 39 (25%) isolates, 16 (41%) belonging to Enterobacteriaceae family, 14 (36%) P. aeruginosa and 9 (23%) A. baumannii. It is important to highlight that 32% (14/43) of the P. aeruginosa isolates in this study were confirmed as carriers of blaVIM, which is a higher rate when compared to other Brazilian studies. In conclusion, it was observed a high frequency of blaVIM in GNB derived from clinical samples, especially in the most recent years of the historical series analyzed.

Keywords: antimicrobial resistance, blaVIM, carbapenem resistance, gram-negative bacilli, Pseudomonas aeruginosa

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