TITLE: *Klebsiella pneumoniae* infections resistant to carbapenems: determination of minimum inhibitory concentration between different biological samples

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ABSTRACT:

Infections caused by *Klebsiella pneumoniae* resistant to carbapenems are becoming an increasingly significant problem worldwide and it is associated with high morbimortality rates and associated costs, especially in hospitalized patients. This study aimed to determine the minimum inhibitory concentration (MIC) of carbapenems of 180 *K. pneumoniae* strains isolated from different samples sent to the Hermes Pardini Institute during the period from October 2018 to March 2019. The microorganism identification was performed by MALDI-TOF (VITEK® MS /bioMérieux) and the MIC determination was performed by VITEK® 2 Compact (bioMérieux). In the urine samples were tested the meropenem and ertapenem antibiotics. In the other samples were tested the imipenem, meropenem and ertapenem antibiotics. The samples analyzed were the following: urine (50.0%; n=90), blood (27.2%; n=49), tracheal aspirate (11.1%; n=20), wound secretions (7.2%; n=13), body fluids (2.8%; n=5) and catheter tip (1.7%; n=3). In urine samples, the meropenem resistant MICs were the following: 8 mcg/mL (2/90) and ≥16 mcg/mL (28/90) and the ertapenem resistant MICs were the following: 4 mcg/mL (6/90) and ≥ 8 mcg/mL (31/90). In the blood and secretion samples, the imipenem resistant MICs were the following: 4 mcg/mL (2/90), 8 mcg/mL (13/90) and ≥16 mcg/mL (43/90). The meropenem resistant MICs were the following: 4 mcg/mL (2/90), 8 mcg/mL (1/90) and ≥16 mcg/mL (57/90) and finally, the ertapenem resistant MICs were the following: 2 mcg/mL (1/90), 4 mcg/mL (9/90) and ≥ 8 mcg/mL (54/90). Furthermore, 64.4% (58/90) of the isolates were resistant to imipenem, 56.1% (101/180) to ertapenem and 50.0% (90/180) to meropenem. The high percentage of strains that showed resistance to all carbapenems tested (46.3%) has caused concern in the current scenario. The most prevalent samples in this case were the following: body fluids (100.0%; n = 5/5), catheter tip (100.0%; n = 3/3), wound secretions (76.9%; n = 10/13), tracheal aspirate (65.0%; n = 13/20), blood (53.1%; n = 26/49) and urine (32.2%; n = 29/90). Given the increasingly limited therapeutic options and the need to the use of carbapenems associated with other drugs, even when the bacterium has a minimum inhibitory concentration compatible with decreased sensitivity, determination of the minimum inhibitory concentration becomes increasingly important for an antibiotic therapy more objective and rational, with greater possibility of therapeutic success.

Keywords: *Klebsiella pneumoniae*, minimum inhibitory concentration, carbapenems