TITLE: KPC, NDM AND OXA-48 LIKE EPIDIOMOLOGY IN A HOSPITAL FROM SOUTH BRAZIL

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ABSTRACT:
Carbapenemases, such as KPC, NDM and OXA-48 like, have become the most worrisome problem in health care institutions regarding bacterial infections. These enzymes can easily spread from one patient to another if hygiene and cleaning measures are not efficiently applied. Identification of the enzyme is necessary, not only for implementation of contact precautions, but to prevent the spread of these resistance mechanisms and, more recently, to indicate antibiotic therapy, because the new drug ceftazidime/avibactam is not effective against metallo-beta-lactamases. Since most healthcare-related infections are related to venous catheter, urinary catheter, endotracheal cannula and surgical wound, we aimed to evaluate the incidence of KPC, NDM and OXA-48 like carbapenemases detected from blood, urine, tracheal aspirate and surgical wound cultures. This was a retrospective study performed on the electronic database from a laboratory from south Brazil. Data were collected from October 2019 to July 2021. In total, 2368 *Enterobacterales* isolates were included (344 from blood cultures, 1108 from urine culture, 439 from tracheal aspirate culture, 45 from surgical wound and 432 from other specimen cultures). Identification of KPC, NDM and OXA-48 like carbapenemases was performed with RESIST-3 O.K.N. K-SeT kit (Coris), an immunochromatographic assay. For all the period and samples analyzed, KPC remains the most frequent, representing 76 ± 7% (mean ± SD); NDM incidence was 21 ± 6%; OXA-48 like was 0.06 ± 0.27%; and KPC/NDM co-producer was 3 ± 3%. While KPC incidence has maintained similar every month, NDM demonstrated a significant raise from July 2020 to June 2021, with incidence rates varying from 18 to 32%. There was also an increase on KPC/NDM co-producer isolates, which varied from 0 to 4% from October 2019 to March 2021; and from April 2021 until July 2021, they reached 4 to 9% of the carbapenemase positive isolates. On the other hand, only one isolate was positive for OXA-48 like, which was detected from a urine sample. Although the methodology used can not identify other resistance mechanism or other carbapenemases, it is easily performed and provides a rapid identification, allowing a fast management of hospital beds in order to prevent dissemination of carbapenemase producers. The increase on NDM and KPC/NDM co-producers are very concerning, since the treatment becomes more limited and it demonstrates that standard and contact precautions must be reinforced.

Keywords: KPC, NDM, OXA-48 like, carbapenemase, epidemiology.

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