

TITLE: Emergence and dissemination of NDM-1-producing Enterobacteriaceae at hospitals in the state of Pará, Brazil: the importance of epidemiological surveillance in the control of antimicrobial resistance

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Carbapenem-resistant Enterobacteriaceae (CRE) present a serious public health problem. In Brazil, production of *Klebsiella pneumoniae* carbapenemase (KPC) is the most frequent mechanism of carbapenem resistance employed by members of the family Enterobacteriaceae. However, the increasing emergence of New Delhi metallo- β -lactamase (NDM) in CRE in Brazilian hospitals should be viewed with caution due to its high potential for dissemination. This study aimed to verify the presence of the *bla*_{NDM} gene in 258 clinical isolates of CRE, received from seven hospitals in the state of Pará, Brazil, from August 2018 to May 2019. Isolates were obtained from various clinical specimens (blood, urine, bronchoalveolar lavage, tracheal secretion, wound secretion, and swab) and antimicrobial susceptibility testing was carried out using the Vitek 2 System at the hospitals of origin. Detection of the carbapenemase genes (*bla*_{NDM}, *bla*_{KPC}, *bla*_{OXA-48}) was performed by PCR at the Evandro Chagas Institute, a reference center located in the state of Pará for the epidemiological surveillance of antimicrobial resistance in hospitals. A total of 19 CRE isolates [12 *Klebsiella pneumoniae*, 6 *Escherichia coli* and 1 *Klebsiella (Enterobacter) aerogenes*] were positive for the *bla*_{NDM} gene and sequencing revealed the *bla*_{NDM-1} variant. One *Klebsiella pneumoniae* isolate was also positive for the *bla*_{KPC} gene, thus being a co-producer of KPC and NDM. Isolates showed resistance to all β -lactams tested and more than 90% were resistant to ciprofloxacin and gentamicin. The most effective in vitro antimicrobials tested were amikacin, tigecycline, and colistin. The twelve isolates of NDM-1-producing *Klebsiella pneumoniae* were obtained from six different hospitals in the city of Belém, Brazil, demonstrating the dissemination potential of these microorganisms. In conclusion, this abstract reports the emergence of three species of NDM-1-producing CRE at hospitals in the state of Pará, Brazil, reinforcing the need for greater infection control measures to avoid the spread of carbapenemase-producing microorganisms.

Keywords: CRE, NDM-1, *klebsiella pneumoniae*

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