

**TITLE:** ISOLATION OF *bla*<sub>NDM</sub>-PRODUCING ENTEROBACTERIACEAE IN A PUBLIC HOSPITAL IN SALVADOR - BAHIA – BRAZIL

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**ABSTRACT:**

Metallo- $\beta$ -lactamases (MBLs) are classified as Class B of Ambler and differ from other carbapenemases by using zinc at the active site. In 2008, a group of researchers from India described a new variant of MBL, called New Delhi metallo- $\beta$ -lactamase (NDM), encoded by the gene *bla*<sub>NDM</sub>. We describe the isolation of two NDM-producing microorganisms derived from samples from two patients admitted to a university hospital in Salvador, State of Bahia. These are the first cases of NDM described in the north and northeast of Brazil. The identification and antimicrobial susceptibility tests were performed on Vitek 2 and the minimum inhibitory concentrations (MICs) to carbapenems were confirmed using Etest strips. Modified Hodge Test (MHT) and phenotypic testing discs synergy with meropenem, imipenem, ertapenem and with and without EDTA 0.1M, cloxacillin and phenylboronic acid were performed. The isolates were also analyzed by multiplex PCR for *bla*<sub>IMP</sub>, *bla*<sub>VIM</sub>, *bla*<sub>NDM</sub>, *bla*<sub>KPC</sub> and *bla*<sub>OXA-48</sub> enzymes. The three isolates analyzed showed MICs to ertapenem, meropenem and imipenem higher than the 32 mg / mL. The MHT were negative and synergy tests showed increased inhibition zone (> 5 mm) in carbapenems discs in the presence of EDTA, EDTA-free in relation to the discs, and were negative with phenylboronic acid and cloxacillin for the microorganisms tested. Enterobacteria that carry resistance gene to carbapenems, including *bla*<sub>NDM</sub>, are considered an important public health problem because of the possibility of expansion of the genes and the clinical impact on the management of infections associated with these microorganisms. This report of NDM isolates in two different microorganisms, *K. pneumoniae* and *C. freundii*, confirms the risk of spread of resistance genes between different species. The rapid spread of genes conferring resistance to carbapenems, *bla*<sub>KPC</sub>, *bla*<sub>NDM</sub>, among others, is of great concern because the emergence of multi-resistant microorganisms is a threat to public health due to the shortage of new antibiotics in development. This report emphasizes the need for strict measures to prevent and control infections, which can minimize the spread of genes conferring resistance to carbapenems among different species of Enterobacteriaceae.

**Keywords:** New Delhi Metallo- $\beta$ -lactamase, carbapenemase, antimicrobial resistance, molecular diagnosis.