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Poster Session V
Worldwide spread of carbapenem resistance

FIRST DESCRIPTION OF NDM-1-PRODUCING KLEBSIELLA PNEUMONIAE IN BRAZIL

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Objectives? NDM-1 carbapenemase was first described in Brazil (2013) in a *Providencia rettgeri* isolated in the Rio Grande do Sul state (south region). Here we report the first identification and molecular characterization of NDM-1-producing *Klebsiella pneumoniae* in Rio de Janeiro, southeast region of this country.

Methods: Bacterial Identification was performed by conventional techniques, followed by 16S rDNA amplification and sequencing. Antibiotic susceptibility was determined by disc diffusion method and Etest. Screening for resistance genes was performed by PCR for carbapenemase genes (bla_{KPC}, bla_{OXA-48}, bla_{IMP}, bla_{VIM}), ESBL genes (bla_{TEM}, bla_{SHV}, bla_{CTX-M}, bla_{GES}), aminoglycoside resistance genes (*aadA*, *aac(6)-Ib*, *aac(3)-IIa*, *rmt*A, rmtB, rmtC, *rmt*D, armA and *npm*A); quinolone resistance genes (qnrA, qnrB, qnrS and qepA) and integrons, followed by sequencing. For molecular typing, MLST was performed. Plasmid analysis was performed using S1 nuclease and southern blot hybridizations. The genetic environment surrounding the bla_{NDM-1} was analyzed using the Illumina MiSeq system, and the assemble of the reads were made with the Velvet algorism.

Results? NDM-1 producing *K.pneumoniae* was recovered from a male inpatient (61 years-old), who had cerebrovascular accident. He was admitted in a tertiary public hospital in the city of Campos, Rio de Janeiro state. This isolate was recovered from retal swab, obtained during surveillance. It was considered multiresistant, being resistant to all beta-lactams, ciprofloxacin, sulfamethoxazole/trimethoprim, gentamicin, amikacin, and susceptible to tigecycline. Besides the bla_{NDM-1}, this isolate carried different resistance genes: bla_{TEM-15}, bla_{SHV-99}, $bla_{CTX-M-2}$, *aac(3)-IIa, aadA1, aadA2, qnrA1;* and a class-1 integron, containing the *arr-5* cassette. Using MLST, it was characterized as ST323, which had already been observed in a Brazillian KPC-producing strain isolated in 2010 from Minas Gerais state (also in the southeast region). Plasmid analysis followed by hybridization showed the bla_{NDM-1} in a 190kb plasmid. Using the Illumina MiSeq approach we observed the bla_{NDM-1} gene flanked by a truncated IS*Aba*125 at the right boundary and by a *GroEL* and a bleomycin-resistance gene (ble_{MBL}) at the left boundary. bla_{NDM-1} has been associated with different mobile elements; however, a complete form or variations of IS*Aba*125 have been found upstream this gene, suggesting that IS*Aba*125 might be responsible for its mobilization.

Conclusion? This study shows a multiresistant *K.pneumoniae* carrying bla_{NDM-1} in a plasmid associated with mobile genetic element of epidemiological importance worldwide. This strain belonged to ST323, previously found in Brazil in KPC-producing *K.pneumoniae*, warning to the high capacity of acquisition and dissemination of different resistance genes by this organism. We also raise the alert as our evidence showing the asymptomatic carriage of NDM-positive gut bacteria, means that our current views on the extent of the spread of NDM may well be underestimated.