LETTER TO THE EDITOR

First report of a clinical isolate of blaOXA-48- carbapenemase producing Raoultella ornithinolytica in South America

Primer informe de un aislado clinico de Raoultella ornithinolytica productora de carbapenemasa blaOXA-48 en América del Sur

Dear Editor:

Raoultella spp., a bacterium named after Didier Raoul, is a Gram-negative belonging to the Enterobacteriaceae family. There have been described 4 species: Raoultella planticola, Raoultella ornithinolytica, Raoultella terrigena, and Raoultella electrica, all species are inhabitants of soil and plants. Recently, R. planticola and R. ornithinolytica have been associated with human infections and resistance to different antibiotics including carbapenems5. In this report, we describe an infection caused by blaOXA-48 producing R. ornithinolytica. A 64-year-old male patient was admitted into a 700-bed hospital in Quito, in order to restore intestinal transit after ileocecal resection. Two days after admission the patient presented sepsis characterized by hypotension, fever, and leukocytosis. The patient was directed to intensive care unit where he was treated with Ampicillin/sublactam for 10 days, subsequent blood cultures were negative however Escherichia coli was recovered from tracheal aspirate. The patient was submitted to the surgical department to continue treatment and 10 days late he presented a surgical site infection, R. planticola (resistant to imipenem and piperacillin/tazobactam but susceptible to third generation cephalosporins and ciprofloxacin) was isolated and detected using a Vitek® compact 2 system (Biomerieux, France), CARD AST 272 (Table 1). The patient was treated with ciprofloxacin 500 mg i.v. q12h and recovered satisfactorily.

Isolate analysis using DNA sequences of rpoB and 16S rRNA genes and MALDI-TOF Vitek MS system, (bioMérieux) indicated that the isolate was R. ornithinolytica (99.9% identification score). The RAPIDEC CARBA NP® (bioMérieux) assay was positive and polymerase chain reaction (PCR) amplifying the blaOXA-48 associated with Tn1999 was performed5. The amplicon was cleaned, using Wizard® SV gel, and sequenced in Macrogen (South Korea); nucleotide sequences showed the presence of blaOXA-48 gene (accession no.: MH507508) and Tn1999 (accession no.: MK359485). The amplicon showed 99% nucleotide identity to a Tn1999 harboring blaOXA-48 previously described in Klebsiella pneumoniae (accession no.: JN62686). We were unable to determine the plasmid incompatibility group (conjugation using E. coli J53 as the recipient was unsuccessful), nor could we establish whether the patient was colonized by R. ornithinolytica before the surgery. To the best of our knowledge, this is the first description of a clinical isolate of R. ornithinolytica harboring blaOXA-48 in Ecuador and possibly in South America. Nevertheless, blaOXA-48 genes in Enterobacteriaceae have been described in Latin American and Caribbean countries5. In Ecuador, a blaOXA-48-like gene was found previously in K. pneumoniae (accession number KY60932.1). The blaOXA-48-like gene has been found associated with 5 isoforms of Tn1999 in Enterobacteriaceae; interestingly, an R. ornithinolytica strain containing blaOXA-48 associated with Tn1999.2 was detected in Lebanon7. The genetic closeness of Raoultella spp. and Klebsiella spp., may lead to misidentification using biochemical tests e.g., Vitek 2 system, the introduction of rpoB and 16S rRNA genes analysis and the new

Table 1 Antibiotic sensitivity tests, carbapenemase assays and carbapenemase gene detection in an Ecuadorian Raoultella ornithinolytica isolate.

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<thead>
<tr>
<th>Minimum inhibitory concentration (µg/ml) using vitek 2 system</th>
<th>CIM</th>
<th>Rapidec CarbaNP</th>
<th>PCR and sequencing</th>
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<tr>
<td>Amp/Sul</td>
<td>Pip/Taz</td>
<td>Cfx</td>
<td>Ctx</td>
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<tr>
<td>&gt;32</td>
<td>&gt;128</td>
<td>&lt;1</td>
<td>&lt;1</td>
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technology based in MALDI-TOF MS allowed us a correct identification to species level of Raoultella spp. Thus, our results underline the accuracy of MALDI-TOF MS in R. ornithinolytica identification. This report was approved by the institutional human ethics committee Cod: 02-01-2018-003.

Ethical approval

This study was approved by Ethics Committee in Humans of Carlos Andrade Marin hospital Cod: 02-01-2018-003.

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Contributions

JR and GT: conception, design of the study and drafting the article. EV, FV, EP, NC, ME: acquisition of data, analysis and interpretation. BN and GT revising critically for important intellectual content of article. GT: final approval of the version to be submitted.

Conflict of interest

The authors declare that they have no conflict of interest.

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References


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