Case Report

Correspondence

B. M. Moreira

bmeurer@micro.ufrj.br

A case of severe pancreatitis complicated by *Raoultella planticola* infection

M. S. Alves,^{1,2} L. W. Riley³ and B. M. Moreira²

¹Departamento de Análises Clínicas, Faculdade de Farmácia e Bioquímica, Universidade Federal de Juiz de Fora, Campus Universitário, Bairro Martelos, Juiz de Fora, MG 36036-330, Brazil

²Instituto de Microbiologia, Universidade Federal do Rio de Janeiro, Centro de Ciências da Saúde, Bloco I, Cidade Universitária, Rio de Janeiro, RJ 21941-590, Brazil

³School of Public Health, University of California, Berkeley, 140 Warren Hall, Berkeley, CA 94720, USA

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A 45-year-old-male presented with severe pancreatitis. Two bacterial isolates obtained from peritoneal fluid and abdominal purulent secretion were identified to the species level by 15 biochemical tests and four supplementary tests as *Raoultella planticola*. Identification was confirmed by *rpoB* gene sequencing. *R. planticola* is difficult to identify in the clinical laboratory, and the clinical significance of this isolation remains uncharacterized. This is the first report of pancreatitis with a primary infection by *R. planticola*.

Introduction

Raoultella planticola was first described as *Klebsiella planticola* in 1981 (Bagley *et al.*, 1981) and as *Klebsiella trevisanii* in 1983 (Ferragut *et al.*, 1983). In 1986, the two organisms were placed in the same species because of their extensive DNA sequence similarity (Gavini *et al.*, 1986). In 2001, based on 16S rRNA gene and *rpoB* sequence analysis, the new genus *Raoultella* was created, and the name *R. planticola* was proposed to accommodate *K. planticola* (Drancourt *et al.*, 2001).

R. planticola was initially seen as an aquatic, botanic and soil bacterium. However, in 1984, a human infection caused by this organism was reported: a patient with sepsis, admitted to an intensive care unit in France (Freney *et al.*, 1984). Two other cases were later described: a bloodstream infection after a mitral valve replacement for infective endocarditis and a bacteraemic pneumonia after coronary artery graft surgery (Freney *et al.*, 1986). No other case reports or case series of infections caused by *R. planticola* have been published, and the clinical spectrum of diseases caused by this organism is unknown. The correct identification of *Raoultella* is not easily accomplished in most clinical microbiology laboratories, and isolates can be easily misidentified as *Klebsiella pneumoniae* or *Klebsiella oxytoca* (Monnet & Freney, 1994). In the present report, we describe a patient with pancreatitis with a primary infection by *R. planticola*.

Case report

On 2 September 2003, a 45-year-old male patient was admitted to a small (80 beds) public general hospital in Juiz de Fora, Minas Gerais state, Brazil, with abdominal pain, diarrhoea and a 30-year history of alcoholism. After 10 days of treatment for a suspect pneumonia and no invasive procedures, abdominal symptoms persisted and the patient was transferred to Hospital Universitário of Universidade Federal de Juiz de Fora on 12 September 2003. On admission, he had abdominal pain, vomiting, diarrhoea and fever. Chest X-ray and an abdominal CT scan revealed a small left pleural effusion and two abdominal fluid collections. Ciprofloxacin and metronidazole were started. On September 16, the patient underwent an exploratory laparotomy. Pancreatitis with a retroperitoneal abscess was diagnosed, with inflammation of pancreatic body and tail. A Gram-negative bacterial isolate was obtained as pure culture from the peritoneal fluid collected before surgery (isolate K111) and from abdominal pyogenic secretion obtained during surgery (isolate K112). Other clinical specimens (urine, catheter tip and three blood samples) sent for culture were negative. The patient made a full recovery after 15 days on imipenem and amikacin and placement of a new abdominal drainage. He was discharged on October 21.

Bacterial isolates K111 and K112 were part of a surveillance study for characterization of klebsiellae infections. Both bacterial isolates were identified as *K. oxytoca* in the original clinical laboratory by non-automated biochemical tests. Isolates were re-evaluated in 15 biochemical tests for members of the *Enterobacteriaceae* (Farmer *et al.*, 1985), and four supplementary tests (Drancourt *et al.*, 2001;

The GenBank/EMBL/DDBJ accession numbers for the *rpoB* sequences of the two *Raoultella planticola* isolates are DQ415504 and DQ415505.

Fig. 1. Dendrogram obtained with *R. planticola* isolates K111 and K112 and other reference strains. The profile shown for *K. pneumoniae* ATCC 700603, with only three bands, was reproducible in three experiments with independent DNA extractions.

Monnet & Freney, 1994). Both isolates formed typical red colonies indicating fermentation of lactose and acid production on MacConkey agar; were oxidase- and Voges-Proskauer-negative, did not produce H₂S, and did not utilize arginine or phenylalanine; fermented glucose; utilized citrate, lysine, malonate and L-sorbose, and were urease- and methyl red-positive; and were non-motile. Isolates were positive for indole production, histamine assimilation and growth at 10 °C, and did not utilize ornithine or D-melezitose, and were identified as *R. planticola*. Biochemical identification was confirmed by *rpoB* gene sequencing as described by Drancourt *et al.* (2001). The two *R. planticola* isolates exhibited 98% *rpoB* gene sequence similarity to known *R. planticola* strains, including the type strain *R. planticola* ATCC 33531^T. By disc diffusion (Clinical and Laboratory Standards Institute, 2005), isolates were resistant to ampicillin and susceptible to amikacin, amoxicillin-clavulanate, aztreonam, cefepime, cefotaxime, cefoxitin, ceftazidime, cephalothin, ciprofloxacin, gentamicin, imipenem and trimethoprim-sulfamethoxazole, and did not exhibit extended-spectrum β -lactamase production. A dendrogram of ERIC-PCR profiles (Pellegrino *et al.*, 2002) obtained with GelComparII, version 3.5 (Applied Maths), compared by the Dice index and the unweighted pair group method with arithmetic averages (UPGMA) is shown in Fig. 1. The two isolates had identical banding profiles.

Discussion

The genus *Klebsiella* has been recently re-analysed regarding its phylogenetic structure. All studies performed to date have shown the taxonomic heterogeneity of this organism, and the new genus *Raoultella* has been proposed for some of these isolates. The isolation of *R. planticola* from human specimens has been reported as part of studies on various collections of isolates (Freney *et al.*, 1984, 1986; Monnet & Freney, 1994). However, the clinical significance of this isolation remains uncharacterized. To date, only three case reports have described invasive diseases caused by this organism (Freney *et al.*, 1984, 1986). In the present report, *R. planticola* was repeatedly isolated in pure culture from intra-abdominal pyogenic specimens. The patient had pancreatitis with an infection that occurred without any

abdominal manipulation. However, it is likely that previous antimicrobial exposure for the treatment of a questionable pneumonia selected for this agent. *R. planticola*, like other *Raoultella* species, carries a chromosomal β -lactamase that makes this agent naturally resistant to several antimicrobial agents.

R. planticola is difficult to identify in the clinical laboratory. Nevertheless, the correct identification of bacterial species is the most important measure to guide antimicrobial treatment and detect outbreaks.

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References

- Bagley, S. T., Seidler, R. J. & Brenner, D. J. (1981). *Klebsiella planticola* sp. nov.: a new species of *Enterobacteriaceae* found primarily in nonclinical environments. *Curr Microbiol* 6, 105–109.
- Clinical and Laboratory Standards Institute (2005). *Performance Standards for Antimicrobial Susceptibility Testing; Fifteenth Informational Supplement*. Document M100–S15. Wayne, PA: Clinical and Laboratory Standards Institute.
- Drancourt, M., Bollet, C., Carta, A. & Rousselier, P. (2001). Phylogenetic analyses of *Klebsiella* species delineate *Klebsiella* and *Raoultella* gen. nov., with description of *Raoultella ornithinolytica* comb. nov., *Raoultella terrigena* comb. nov. and *Raoultella planticola* comb. nov. *Int J Syst Evol Microbiol* 51, 925–932.
- Farmer, J. J., III, Davis, B. R., Hickman-Brenner, F. W., McWhorter, A., Huntley-Carter, G. P., Asbury, M. A., Riddle, C., Wathen-Grady, H. G., Elias, C. & other authors (1985). Biochemical identification of new species and biotypes of *Enterobacteriaceae* isolated from clinical specimens. *J Clin Microbiol* 21, 46–76.
- Ferragut, C., Izard, D., Gavini, F., Kersters, K., De Ley, J. & Leclerc, H. (1983). *Klebsiella trevisanii*: a new species from water and soil. *Int J Syst Bacteriol* 33, 133–142.
- Freney, J., Fleurette, J., Gruet, L. D., Desmonceaux, M., Gavini, F. & Leclerc, H. (1984). *Klebsiella trevisanii* colonisation and septicaemia. *Lancet* 1, 909.

Freney, J., Gavini, F., Alexandre, H., Madier, S., Izard, D., Leclerc, H. & Fleurette, J. (1986). Nosocomial infection and colonization by *Klebsiella trevisanii*. *J Clin Microbiol* **23**, 948–950.

Gavini, F., Izard, D., Grimont, P. A. D., Beji, A., Ageron, E. & Leclerc, H. (1986). Priority of *Klebsiella planticola* Bagley, Seidler, and Brenner 1982 over *Klebsiella trevisanii* Ferragut, Izard, Gavini, Kertters, De Ley, and Leclerc 1983. *Int J Syst Bacteriol* **36**, 486–488.

Monnet, D. & Freney, J. (1994). Method for differentiating *Klebsiella planticola* and *Klebsiella terrigena* from other *Klebsiella* species. *J Clin Microbiol* **32**, 1121–1122.

Pellegrino, F. L. P. C., Teixeira, L. M., Carvalho, M. G. S., Nouér, S. A., Oliveira, M. P., Sampaio, J. L. M., Freitas, A. D., Ferreira, A. L. P., Amorim, E. L. T. & other authors (2002). Occurrence of a multidrug-resistant *Pseudomonas aeruginosa* clone in different hospitals in Rio de Janeiro, Brazil. *J Clin Microbiol* **40**, 2420–2424.