Available online at www.sciencedirect.com

SciVerse ScienceDirect

Diagnostic Microbiology and Infectious Disease 72 (2012) 295–296

DIAGNOSTIC MICROBIOLOGY AND INFECTIOUS DISEASE

www.elsevier.com/locate/diagmicrobio

Letter

POM-1 metallo-β-lactamase–producing *Pseudomonas otitidis* isolate from a patient with chronic otitis media☆

Sir,

Pseudomonas otitidis is a new species designated by Clark et al. (2006). Roland and Stroman (2002) reported 33 *Pseudomonas* "*otitidis*" otic infections in the USA. Recently, 2 isolates of *P. otitidis* were identified by molecular characterization among 104 phenotypically identified *Pseudomonas aeruginosa* isolates from otic infections in Japan (Motoshima et al., 2007). We report a case of chronic otitis media due to *P. otitidis*.

A 53-year-old man presented to a Korean hospital in 2005 with a chief complaint of ear discharge. Examination of his right ear showed erosion of the tympanic membrane with purulent discharge, and a culture yielded an isolate of Gram-negative bacilli. Treatment included oral trimethoprim–sulfamethoxazole (80–400 mg twice a day for 2 weeks), topical ofloxacin (3 mg/mL solution applied twice a day for 4 weeks), and boric acid plus carbol-fuchsin dressings for 4 weeks. The otic discharge subsided and the *P. otitidis* isolate was no longer cultivable.

Our isolate was presumptively identified as *P. aeruginosa*, but it was negative for pyocyanin and fluorescein. Species identification using ID 32 GN test strips (bioMérieux, Marcy l'Etoile, France) yielded ambiguous results: *P. aeruginosa* (ID = 1.5%). Analysis of the 16S rRNA gene sequence revealed 100% identity of our isolate (GenBank accession no. HQ615871) with the *P. otitidis* type strain (GenBank accession no. AY953147).

Susceptibility testing by the CLSI (2011) methods showed that the *P. otitidis* isolate had an unusual susceptibility as an MBL producer, i.e., resistant to carbapenems but susceptible to piperacillin, ceftazidime, and cefepime (Table 1). MICs of piperacillin, cefotaxime, and aztreonam were slightly higher than those tested by Etest (AB bioMérieux, Solna, Sweden) (Thaller et al., 2011). The results of an imipenem-disk Hodge test and a double-disk synergy test using disks of imipenem and EDTA + sodium mercaptoacetic acid were positive, indicating production of a metallo-β-lactamase (MBL) (Lee et al., 2010), but $bla_{\text{IMP-1}}$-, $bla_{\text{VIM-2}}$-, or $bla_{\text{SIM-1}}$-like, present in Korea at that time, was not detectable by polymerase chain reaction. An investigation resulted in finding a new MBL, POM-1 (Thaller et al., 2011).

A GenBank search showed 12 isolates of *P. otitidis*, including the type strain and our isolate. The source of the other isolates included plant, water, and an environmental sample. Clinical microbiologists should be able to differentiate intrinsically MBL-gene possessing *P. otitidis* from *P. aeruginosa.* After 24-h incubation of a blood agar plate at 35 °C, the colonies of our *P. otitidis* isolate were large (mean diameter, 1.6 mm) with incomplete hemolysis. A stained smear showed slender, Gram-negative, regular bacilli similar to those of *P. aeruginosa*. The isolate was oxidase positive, grew at 42 °C, and oxidized glucose, but not mannose, mannitol, and xylose. We suggest that *Pseudomonas* isolates with no blue-green pigment and with unusual β-lactam susceptibility should be identified by analyzing the 16S rRNA gene sequence. It was suggested that detection of $bla_{\text{POM-1}}$ could be used for identification of *P. otitidis* isolates (Thaller et al., 2011).

In conclusion, *P. otitidis* is difficult to identify by phenotypic tests. The organism has an intrinsic $bla_{\text{POM-1}}$ gene, but shows unusual β-lactam susceptibilities that can potentially misguide antimicrobial therapy.

Table 1
MICs of antimicrobial agents determined by the CLSI agar dilution method for a *P. otitidis* isolate

Antimicrobial agent	MIC (μg/mL)	Susceptibility
Ampicillin	128	R[a]
Ampicillin–sulbactam	128	R[a]
Piperacillin	4	S
Cephalothin	>128	R[a]
Cefotaxime	4	R[a]
Ceftazidime	4	S
Cefepime	4	S
Aztreonam	8	S
Imipenem	>32	R
Meropenem	>32	R
Amikacin	0.5	S
Gentamicin	0.12	S
Tobramycin	0.12	S
Ciprofloxacin	1	S
Trimethoprim–sulfamethoxazole	2/38	S

R = resistant; S = susceptible.

[a] Based on breakpoints for Enterobacteriaceae; others are based on breakpoints for *P. aeruginosa*.

☆ None of the authors has any potential conflicts of interest to report.

Acknowledgments

The authors would like to thank Ms. Young Hee Suh for her keen eye and years of experience in detecting this unusual isolate.

Kyungwon Lee
Department of Laboratory Medicine and
Research Institute of Bacterial Resistance
Yonsei University College of Medicine
Seoul 120-752, South Korea

Chang-Ki Kim
Korean Institute of Tuberculosis
Seoul 137-900, South Korea

Dongeun Yong
Department of Laboratory Medicine
Yonsei University College of Medicine
Seoul 120-752, South Korea

Jong Hwa Yum
Department of Clinical Laboratory Science
Dong-eui University
Busan 614-714, South Korea

Myung-Hyun Chung
Department of Otorhinolaryngology
Yonsei University College of Medicine
Seoul 120-752, South Korea

Yunsop Chong
Department of Laboratory Medicine
Yonsei University College of Medicine
Seoul 120-752, South Korea
E-mail address: whonetkor@yuhs.ac

Maria C. Thaller
Dipartimento di Biologia
Università di Roma "Tor Vergata"
I-00133 Rome, Italy

Gian M. Rossolini
Dipartimento di Biologia Molecolare
Sezione di Microbiologia
Università di Siena
I-53100 Siena, Italy

doi:10.1016/j.diagmicrobio.2011.11.007

References

Clark LL, Daics JJ, McLean CH, Bartell JG, Stroman DW (2006) *Pseudomonas otitidis* sp. nov., isolated from patients with otic infections. *Int J Syst Evol Microbiol* 56:709–714.

Clinical and Laboratory Standards Institute (CLSI) (2011) Performance standards for antimicrobial susceptibility testing; 21st information supplement (M100-S21). Wayne, PA: CLSI.

Lee K, Kim CK, Yong D, Jeong SH, Yum JH, Seo YH, Docquier JD, Chong Y (2010) Improved performance of the modified Hodge test with MacConkey agar for screening carbapenemase-producing Gram-negative bacilli. *J Microbiol Methods* 83:149–152.

Motoshima M, Yanagihara K, Fukushima K, Matsuda J, Sugahara K, Hirakata Y, Yamada Y, Kohno S, Kamihira S (2007) Rapid and accurate detection of *Pseudomonas aeruginosa* by real-time polymerase chain reaction with melting curve analysis targeting *gyrB* gene. *Diagn Microbiol Infect Dis* 58:53–58.

Roland PS, Stroman DW (2002) Microbiology of acute otitis externa. *Laryngoscope* 112:1166–1177.

Thaller MC, Borgianni L, Di Lallo G, Chong Y, Lee K, Dajcs J, Stroman D, Rossolini GM (2011) Metallo-β-lactamase production by *Pseudomonas otitidis*: a species-related trait. *Antimicrob Agents Chemother* 55:118–123.