Journal of Coastal Life Medicine

journal homepage: www.jclmm.com

Letter to editor https://doi.org/10.12980/jclm.5.2017J7-102

Nocardia spp. are pathogenic environmental bacteria

Masoud Keikha*

Department of Microbiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Dear editor,

Nocardia spp. are Gram-positive, aerobic, filamentous, non-spore forming, partially acid-fast and slow-growing bacteria which are found worldwide in environmental resources such as soil and water. This group of bacteria can enter the human body by inhalation and traumatic inoculation that may lead to localized (pulmonary nocardiosis) and disseminated (systemic nocardiosis) infections[1-3]. Nocardial infections usually occur in immunocompromised people, such as those who consume steroids and immunosuppressive drugs, patients affected by HIV, alcohol abusers, diabetes mellitus patients and transplant recipients. According to the latest reports, prevalence of nocardiosis is increasing[3,4]. *Nocardia* infections are often misdiagnosed. Also based on previous reports, pulmonary nocardiosis has been misdiagnosed with tuberculosis in more than two thirds of the cases. Nocardial brain abscess has also been misdiagnosed with brain tumors. Therefore, these infections must be correctly diagnosed and appropriate treatment should be prescribed[4,5].

Nocardia species are slow-growing bacteria and their isolation from polymicrobial specimens is difficult. Paraffin baiting technique is one of the effective methods for isolating these bacteria from sputum and different clinical specimens[6-8]. The most basic methods for detecting nocardial infections include observation of colony morphology, Gram staining, use of Kinyoun's acid-fast stain, and observation of growth on lysozyme broth medium[6,7]. Phenotypic methods such as growth at 45 °C, production of arylsulfatase, nitrate reduction, urease, hydrolysis of adenine, casein, esculin, hypoxanthine, tyrosine and xanthine, utilization of acetamide, citrate, L-rhamnose and D-sorbitol were used to identify *Nocardia* spp. These methods are time-consuming, but molecular methods are faster and more precise than phenotypic ones[7-9]. For example, 16S rRNA gene sequencing and PCR restriction fragment length polymorphism of 65-kDa heat shock protein (hsp65) and 16S rRNA gene are popular molecular methods used for molecular identification of *Nocardia*[7].

Nocardiosis must be diagnosed before the dissemination of *Nocardia* spp. to other organs[9]. Usually treatment of nocardiosis consists of frontline drugs including amikacin, amoxicillin-clavulanic acid, ceftriaxone, ciprofloxacin, clarithromycin, imipenem, linezolid, minocycline, sulfamethoxazole or trimethoprim-sulfamethoxazole (TMP-SMX) and tobramycin, and second-line drugs in which cefepime, cefotaxime, doxycycline, gentamicin, gatifloxacin, and moxifloxacin are recommended. However, TMP-SMX is the most commonly used drug for treatment of nocardiosis. This antimicrobial agent is active against most *Nocardia* spp., but could result in side effects such as myelo-suppression, hepatoxicity and renal failure when prescribed in high doses[10].

Conflict of interest statement

I declare that I have no conflict of interest.

References

[1] Rahdar HA, Azadi D, Shojaei H, Daei-Naser A. Molecular analysis and species diversity of *Nocardia* in the hospital environment in a developing country, a potential health hazard. *J Med Microbiol* 2017; **66**(3): 334-41.

[2] González-Nava J, Sánchez-Herrera K, Ramírez-Durán N, Sandoval H. First case of isolation of *Nocardia wallacei* reported in Mexico. *New Microb New Infect* 2016; **14**: 83-4.

[3] Nakamura I, Nagakura T, Fujita H, Fukusima S, Gonoi T. *Nocardia elegans* infection: a case report and literature review. *Int J Infect Dis* 2017; **54**: 15-7.

[4] Castellana G, Grimaldi A, Castellana M, Farina C, Castellana G. Pulmonary nocardiosis in chronic obstructive pulmonary disease: a new clinical challenge. *Respir Med Case Rep* 2016; **18**: 14-21.

[5] Menkü A, Kurtsoy A, Tucer B, Yıldız O, Akdemir H. *Nocardia* brain abscess mimicking brain tumour in immunocompetent patients: report of two cases and review of the literature. *Acta Neurochir (Wien)* 2004; **146**(4): 411-4.

[6] Bafghi MF, Heidarieh P, Soori T, Saber S, Meysamie A, Gheitoli K. *Nocardia* isolation from clinical samples with the paraffin baiting technique. *Germs* 2015; **5**(1): 12.

[7] Brown-Elliott BA, Brown JM, Conville PS, Wallace RJ. Clinical and laboratory features of the *Nocardia* spp. based on current molecular taxonomy. *Clin Microbiol Rev* 2006; **19**(2): 259-82.

[8] Mishra S, Randhawa H. Application of paraffin bait technique to the isolation of *Nocardia asteroides* from clinical specimens. *Applied Microbiol* 1969; **18**(4): 686-7.

[9] Couble A, Rodríguez-Nava V, de Montclos MP, Boiron P, Laurent F. Direct detection of *Nocardia* spp. in clinical samples by a rapid molecular method. *J Clin Microbiol* 2005; **43**(4): 1921-4.

[10] Wilson JW. Nocardiosis: updates and clinical overview. *Mayo Clin Proc* 2012; **87**(4): 403-7.

*Corresponding author: Masoud Keikha, Department of Microbiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.
Tel: +98 9386836425
E-mail: Masoudkeikha@outlook.com

Article history:
Received 9 Jun 2017
Accepted 28 Aug 2017
Available online 21 Oct 2017