Phenotypic and Molecular Identification of Nocardia in Brain Abscess

Sir,

Shirani *et al*. recently reported an article entitled, "Nocardial brain abscess in a patient with pulmonary alveolar proteinosis" (DOI: 10.4103/2277-9175.164004).[1] The genus *Nocardia* is a Gram-positive aerobic, partially acid-fast, and filamentous bacterium that causes nocardial infections (nocardiosis) in human. The genus *Nocardia* is normal microflora in the environment such as soil and dust.[2] Nocardiosis treatment is different in various species, and some species are resistant to different antibiotics such as trimethoprim-sulfamethoxazole, carbapenem, and aminoglycosides, as well as accurate identification in species level is important.

Attention to comments and questions:

1. Isolation and characterization of morphology of colony, aerial hyphae, Gram stain, partially acid-fast, acid-fast, growth in lysozyme broth and molecular methods are important for the genus *Nocardia* confirmation.[2-4] Moreover, other aerobic actinomycetes such as *Gordonia* spp., *Rhodococcus* spp., and *Tsukamurella* spp. are Gram-positive, may be filamentous and colonial morphology are similar to each other. *Gordonia* spp., *Rhodococcus* spp., *Tsukamurella* spp., and *Nocardia* spp. are acid-fast in under certain conditions (bacteria listed are partially acid-fast and normally are not positive for acid-fast staining)[2-12] while authors suggested that branching, filamentous, Gram-positive, and acid-fast positive elements are the genus *Nocardia*
2. Authors reported *Nocardia asteroides* identification with culture and staining.[1] Phenotypic methods such as hydrolysis of amino acids, production of nitrate reductase, gelatinase, and urease, producing acid from carbohydrates, and growth at 45°C[2] are used in species level identification. I have two questions for authors:
   i. The genus *Nocardia* has some of complex groups such as *N. asteroides* complex (*N. asteroides*, *Nocardia cyriacigeorgica*, *Nocardia farcinica,* etc.,) and *Nocardia nova* complex.[2] Authors explain that how identified *N. asteroides* of other species in *N. asteroides* complex?
   ii. The authors have not mentioned of the use of molecular techniques to *Nocardia* identification at species level in the article. The authors explain molecular method if used.
3. In literature, although phenotypic methods are labor intensive and time-consuming, they are used in combination with molecular techniques such as polymerase chain reaction (PCR) sequencing (16S rRNA, *hsp65*, *rpoB*, *gyrB,* and *secA* genes) and PCR-restriction fragment length polymorphism for accurate identification in genus and species levels for *Nocardia*[2,13]
4. Drug choice for nocardiosis treatment is co-trimoxazole, but some of species are resistance to co-trimoxazole and other antibacterial agents; therefore, accurate identification in species level and antimicrobial susceptibility testing are important.[2,14] Further, in literature, some of patients have hypersensitive reaction to co-trimoxazole.[15]

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Conflicts of interest

There are no conflicts of interest.

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