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Title: Identification of Nocardia cyriacigeorgica from cerebral abscess by sequencing 16S rRNA gene and conventional methods; For the first time in Iran

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Abstract:

Background and objectives: Nocardiosis is an acute or chronic infectious disease caused by the soil borne and filamentous bacteria belonging to the genus Nocardia. Approximately 45% of patients with systemic nocardiosis have central nervous system infections. Brain abscess is by far the most common site for nocardial metastasis from pulmonary lesion. Nocardia asteroides is the most common isolates this genus. Nocardia cyriacigeorgica belong to type VI drug pattern. Cerebral abscesses caused by this pathogen account for 2% of all cerebral abscesses. Prognosis is poor and in untreated individuals cause of death is 80 percent. Nocardia cyriacigeorgica is a recently isolated from a brain abscess patient and characterized species within the genus of Nocardia. We describe two cases of cerebral nocardiosis in two immunocompromised women who presented multiple cerebral abscesses.

Material and methods:

The brain biopsy was sent to the laboratory of the Tehran University of Medical Science for bacterial cultures by conventional methods. Portion of the brain biopsy was inoculated onto Sabouraud dextrose agar, blood agar and Lowenstein-Jensen and incubated in 37 and 45°C. Biochemical (Casein, tyrosine, xanthine, hypoxanthine, and urease) and antibiogram tests were done. Also to identification confirmation of species by molecular methods, Predicted 998 bp product from Nocardia was cloned in pTZ57R/T vector and then transformed into E.coli Top 10 F− competent cell for extraction of cloned DNA fragment.

Results:

Nocardia-like organisms grew after 3 days of incubation in all three media. Casein, tyrosine, xanthine, hypoxanthine, and urease tests for bacteria were negative. In antibiogram test, both bacteria were susceptible to amikacin, imipenem, ceftriaxone, cefotaxime and cefamandole but resistance to erythromycin, ampicillin, amoxicillin-clavulanic acid, ciprofloxacin, and ciprofloxacin. Nucleotide sequence was identical and shared a high degree of homology to Nocardia cyriacigeorgica sequence (99.8 % identity at the nucleotide level).

Conclusion:

In conclusion, nocardiosis is an uncommon but important cause of morbidity and mortality in immunocompromised patients. The ability of Nocardia to mimic other infections results in a delay in promptly diagnosing these organisms and this contributes to the increased mortality seen in many reports. Newer diagnostic tools may provide a solution to this problem.

Nocardia cyriacigeorgica, brain abscess, conventional methods, cloning, and sequencing

Presentation: Poster