

CASE REPORT

SUBCUTANEOUS ABSCESS CAUSED BY NOCARDIA ASTEROIDES IN A PATIENT WITH PULMONARY TUBERCULOSIS: CASE REPORT AND REVIEW OF THE LITERATURE

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ABSTRACT: Nocardia spp. are aerobic, filamentous Gram positive bacilli causing different infections, predominantly in the immunocompromised host. Infection is produced by different species like *N. asteroides*, *N. brasiliensis* and *N. otitidiscaviarum*. Different predisposing factors have been reported, like corticosteroid therapy, Diabetes mellitus, and HIV infection.

METHODS: We here report a case of subcutaneous abscess due to *Nocardia asteroides* in a patient with previous history of pulmonary tuberculosis and antitubercular drug intake.

RESULTS AND CONCLUSION: *Nocardia* spp. should be suspected in patients receiving antitubercular chemotherapy.

KEYWORDS: Subcutaneous abscess, antitubercular, *Nocardia asteroides*.

INTRODUCTION: *Nocardia* spp. are aerobic actinomycetes causing various infections, predominantly in the immunocompromised host. Infection is produced by different species, of which *N. asteroides*, *N. brasiliensis* and *N. otitidiscaviarum* are most important. Different predisposing factors have been studied, like corticosteroid therapy, Diabetes mellitus, and HIV infection. We here report a case of subcutaneous abscess due to *Nocardia asteroides* in a patient with previous history of pulmonary tuberculosis and antileprotic drug intake.

CASE REPORT: N, a 28-year old male patient, presented in the department of chest medicine of the institute on 21.05.11 with the chief complaints of chest pain and breathlessness. He did not have any history of Diabetes mellitus or hypertension but admitted to smoking one packet of cigarette per day since the past 5 years on inquiry. A chest roentgenogram was performed, which showed left-sided minimal pleural effusion with lung parenchymal collapse. A sputum sample was obtained from the patient and sent for microbiological investigation to the Department of Microbiology. Acid fast stain of the sputum sample with 20% H₂SO₄ showed long, thin, filamentous acid-fast bacilli. The patient was administered antitubercular drugs for 8

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months. A follow-up X-ray examination of the chest after 2 months showed resolution of the pleural effusion. After 5 months, he developed insidious pain and swelling over his left flank. The patient was again referred to the institute and an aspirate from his left flank lesion was sent to the Department of microbiology. The aspirate was frankly purulent. An acid fast stain with 20% H₂SO₄ showed no acid fast bacilli. However when the staining was carried out with 1% sulphuric acid, thin, beaded, filamentous acid fast bacilli with branching were observed microscopically. Gram staining of the sample showed gram positive, thin, branching, filamentous bacilli. The sample was inoculated on 5% sheep blood agar, Lowenstein Jensen agar slant, MacConkey agar and Sabouraud's dextrose agar. After 48 hours of aerobic incubation at 37° C, small (2-3 mm), light yellow, rough, friable colonies grew on blood agar and L-J slant but not on MacConkey agar. Gram staining of the colonies showed gram positive, filamentous bacilli. Acid fast, filamentous, branching bacilli were observed on acid fast staining of the colonies with 1% sulphuric acid as decolouriser. Few colonies were emulsified in Normal saline in a sterile test tube containing a few sterile glass beads and Citrate utilisation and urease tests were performed and antibiotic susceptibility of the isolate was carried out on Mueller-Hinton agar by the Kirby-Bauer disc diffusion technique. After incubation for 48 hours, the isolate was found to be citrate non-utilising and urease negative. It was susceptible to gentamicin, cotrimoxazole, amikacin and tobramycin and resistant to ciprofloxacin, amoxicillin-clavulanic acid and erythromycin. The isolate also failed to utilise casein, xanthine and tyrosine. Based on these findings, it was presumptively identified as *Nocardia asteroides*.

DISCUSSION: *Nocardia* spp. are aerobic, gram positive, filamentous branching bacilli causing superficial and deep seated opportunistic infections. They are ubiquitously found soil saprophytes comprising about 20 to 30 different species, of which *N. asteroides*, *N. brasiliensis*, *N. farcinica* and *N. otitidiscaviarum* are commonly encountered (1,2). The pathogen was discovered by Edmond Nocard in 1888, and hence the generic name was conferred (3). The first human case was described by Eppinger in 1890 (3). The nocardiae contain tuberculostearic acids but are different from the mycobacteria in possessing shorter -chained mycolic acids (2). Infection is facilitated by factors like the microorganism's ability to inhibit phagolysosomal fusion and enzymes like superoxide dismutase and catalase (4). *Nocardia asteroides* is predominantly implicated in deep-seated infections whereas *N. brasiliensis* has mainly been isolated from superficial infections (5). Nocardiosis most commonly presents as pulmonary disease and lesions in other sites are usually secondary (4). Infection is acquired in most cases through inhalation or direct skin inoculation (6). According to reports worldwide, the most common predisposing factor for nocardiosis is chronic lung disease (4). Other predisposing conditions include HIV infection, Diabetes mellitus, transplantation, haematological malignancies and COPD with steroid therapy. However, about 10% patients with nocardiosis have no identifiable predisposing factor (4). Positive Acid fast stain (Kinyoun's modification) and a positive urease test from culture clinch the diagnosis (5). A definitive identification up to the species level may be achieved by a battery of phenotypic tests, and different schemes have been proposed in this regard. *Nocardia asteroides sensu stricto* Type VI, the commonest species isolated from clinical samples in the United States (4) can be identified on the basis of negative utilisation of casein, xanthine and tyrosine, negative utilisation of citrate, positive growth at 42°C, in-vitro resistance to ciprofloxacin, erythromycin, and amoxicillin-clavulanic acid and susceptibility to gentamicin, amikacin, cotrimoxazole and tobramycin (3). There are a few reports in the literature of isolation of *N. asteroides* from subcutaneous lesions, although this entity is

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rarely reported⁽⁷⁾. Cutaneous involvement is usually seen with disseminated infection but may also occur as primary cutaneous nocardiosis ⁽¹⁾. There are several reports of superficial nocardiosis from India. Devi and others have documented a case of subcutaneous infection due to *N. asteroides* in a renal transplant patient ⁽⁸⁾. According to other Indian reports, primary cutaneous nocardiosis is mainly caused by *N. brasiliensis* ⁽⁵⁾. One report mentions cervicofacial nocardiosis in a HIV-infected patient ⁽³⁾. The patient in our study was put on antitubercular chemotherapy since the past 10 months. It has been shown that both Isoniazid and Rifampicin, which are antitubercular drugs, can produce adverse effects like agranulocytosis and resultant suppression of the cell mediated immune system, by mechanisms like hypersensitivity or idiosyncrasy ^(9,10). It is possible that the patient developed subcutaneous abscess by *Nocardia asteroides* due to this immunosuppression. This case highlights the fact that antitubercular drugs can produce immunosuppression per se and *Nocardia* spp. should be looked for carefully while investigating subcutaneous abscesses in this group of patients.

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