References


Pneumonia Caused by *Nocardia nova* and *Aspergillus fumigatus* after Cardiac Transplantation

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*Nocardia nova*, a newly established species of the *Nocardia asteroides* complex, has recently been characterized as a human pathogen. This report of a case of pneumonia caused by *Nocardia nova* and *Aspergillus fumigatus* in a patient after cardiac transplantation is the first reported infection caused by *Nocardia nova* following its detailed description. Accurate identification and susceptibility testing of the *Nocardia nova* isolate allowed successful oral therapy with clarithromycin when therapy with sulfisoxazole was not tolerated.

The first detailed description of *Nocardia nova* as a pathogen in humans was published recently (1). The species, first described in 1982 (2), was not firmly established as such until 1990 (3). A subgroup of *Nocardia asteroides*, previously shown to be susceptible to ampicillin and erythromycin (4), was shown to be *Nocardia nova* in the recent study (1). We report a case of pulmonary infection caused by *Nocardia nova* and *Aspergillus fumigatus* in a patient three months after cardiac transplantation.

Case Report. The patient was a 63-year-old man who underwent cardiac transplantation because of end-stage ischemic cardiomyopathy. The patient's medication included prednisone (22.5 mg daily), azathioprine (75 mg daily) and cyclosporin (300 mg daily). A routine outpatient chest radiograph obtained three months after transplantation revealed a right upper lobe infiltrate. The patient was asymptomatic at the time but developed a cough productive of yellow sputum and fever of up to 101.7 °F (38.6 °C) over the next two weeks. Repeat chest radiograph showed enlargement of the right upper lobe infiltrate as well as new infiltrates in the right lower lobe.
and left upper lobes. Bronchoscopy was performed and bronchial alveolar lavage specimens grew a *Nocardia* species and *Aspergillus fumigatus*. The patient was treated with sulfisoxazole and amphotericin B. Blood cultures remained sterile and a CT scan of the head was normal. The *Nocardia* species was identified at the Mycobacteria/Nocardia Research Laboratory, University of Texas Health Center, Tyler, as *Nocardia nova*. The in vitro susceptibility of the isolate was tested by both the broth microdilution (4) and disc diffusion methods (5). The isolate was found to be susceptible to ampicillin, erythromycin (MIC 0.25 μg/ml), clarithromycin (MIC ≤ 0.125 μg/ml), amikacin, sulfisoxazole, sulfamethoxazole, trimethoprim-sulfamethoxazole, cefotaxime, ceftriaxone, cefixime and imipenem. The isolate had intermediate susceptibility or resistance to tobramycin, gentamicin, kanamycin, doxycycline, minocycline, amoxicillin-clavulanate and ciprofloxacin.

The patient was discharged from hospital and treated as an outpatient. He completed a course of a total of 3 g of amphotericin B. He continued treatment with sulfisoxazole for five months at which time he was switched to clarithromycin because of persistent, intense pruritis and occasional urticaria. The pruritis and urticaria resolved following the change of antibiotic. Follow-up chest radiographs revealed total resolution of the infiltrates in the left and right lower lobes and a small residual scar in the right upper lobe. The patient was treated for the *Nocardia nova* infection for one year as is frequently done for *Nocardia* infections in the compromised host and specifically in the heart transplant recipient (6). He remained well two months after discontinuation of his antibiotic therapy.

**Discussion.** Cardiac transplant recipients are at risk for infection caused by both *Nocardia* species (6) and *Aspergillus* species (7). Concomitant pulmonary nocardiosis and aspergillosis in the compromised host has been reported twice previously. One case occurred in a cardiac transplant recipient (8) and the second case was reported in a patient with chronic granulomatous disease of childhood (9). This case represents the first report of infection caused by *Nocardia nova* since its recent characterization as a human pathogen (1). Our patient, who was in an immunosuppressed state following cardiac transplantation, belonged to a classic risk group for infection caused by *Nocardia asteroides* complex (6, 10, 11). *Nocardia nova* appears to have identical risk factors. Wallace et al. (1) identified the predisposing cause of *Nocardia nova* infection in 28 of 40 cases. Corticosteroid therapy and/or chemotherapy used for conditions other than organ transplant was present in 32 %, local trauma in 32 % and organ transplant in 21 %. Sixty-five percent of these patients had disease at single sites. Skin and soft tissue infections were most common, followed by infections of the lung and pleural fluid, blood, joints and cornea. Disseminated disease was identified in 35 % of patients, including three patients with central nervous system infection.

It appears that approximately 20 % of *Nocardia asteroides* complex isolates are of the species *Nocardia nova*. These isolates are characterized by susceptibility to ampicillin and erythromycin (4). Testing for susceptibility to erythromycin by the disc diffusion method appears to be a sensitive and specific means of screening for *Nocardia nova*. All 40 *Nocardia nova* strains tested were susceptible to erythromycin whereas only one of 80 non-*Nocardia nova* strains was susceptible in the study of Wallace et al. (1). The macrolides, including the newer agents clarithromycin and azithromycin, may serve as alternative oral agents to sulfonamides when the patient has an allergy, intolerance or lack of response to these latter agents. Publication of more data on the treatment of infection caused by *Nocardia nova* can be expected following the recent characterization of this new species.

**References**