Pleuropulmonary Nocardiosis in an Immunocompromised Patient


Abstract
A 32-year-old male patient presented with high-grade fever, cough with yellowish expectoration, left chest pain, breathlessness on exertion and weakness since 15 days. He was immunocompromised as he was taking steroids and azathioprine for myasthenia gravis since 4 months. Sputum examination showed thin, beaded, branched hyphae on modified acid fast staining and pleural fluid culture grew nocardia and diagnosed as a case of pleuropulmonary nocardiosis.

Introduction
Nocardiosis refers to disease associated with members of genus Nocardia. Nocardial infection is uncommon and approximately 1000 cases of nocardial infections are diagnosed annually in United States, 85% of them are pulmonary and/or systemic. Risk of infection is greater in persons with deficient cell mediated immunity. We present a case of pleuropulmonary Nocardia infection in a patient who was taking steroids and azathioprine for myasthenia gravis and later on turned to be HIV positive. The case illustrates awareness among microbiologists and physicians about such organism in immunocompromised patients.

Case Report
A 32-year-old male, married, government servant presented with complains of high grade fever, cough with yellowish expectoration, left chest pain, severe breathlessness on exertion and weakness since 15 days. On enquiry, he gave history of intermittent fever since 6 months. He was taking T. Methylprednisolone 60 mg OD and T. Azathioprine 50 mg BD since 4 months for myasthenia gravis from a neurophysician whom he visited for muscle weakness and ptosis. He was diagnosed as myasthenia gravis on basis of electromyography-nerve conduction studies (EMG-NC). He also had acute febrile illness with thrombocytopenia in Dec. 2008, which responded to antibiotics and anti-malarial drugs.

During present hospitalisation he was febrile with a pulse rate of 130/min, respiratory rate of 34/min, oxygen saturation of 88% with room air, blood pressure 100/60 mmHg and cold clammy extremities. Upper respiratory tract examination revealed oral candidiasis. He was cyanosed and there was no palpable lymphadenopathy. Respiratory system examination revealed reduced breath sounds on left side with crackles and pleural rub. Other systemic examination revealed no obvious abnormality. After 2 days of hospitalisation, he developed herpes-zoster infection.

Investigations revealed Hb 11.3 gm%, TLC 6720/mm³, with 75% polymorphs and 15% lymphocytes. His procalcitonin levels were high 2 ng/mL, S. proteins-6, Albumin-2.6, Globulin-3.4, A/G ratio-0.8, SGOT, SGPT, S. Bilirubin, GGT BUN, S. creat-normal, LDH- 405. Urine for routine examination was normal. X-ray chest PA view showed left upper and lower lobe consolidation with left sided pleural effusion (Fig. 1). His contrast CT chest (Fig. 2) showed left upper lobe cavity, lower lobe consolidation with pleural effusion. He was treated with parenteral piperacillin-tazobactum, levoflox, and hydrocortisone. Sputum was sent for gram stain and bacterial culture sensitivity. It grew Staph. aureus which was resistant
to piperacillin-tazobactum and smear was negative for acid fast bacilli. Antibiotics were changed, Cefepime was started and levoflox was continued. Patient’s fever was persistent even after 3 days of antibiotics.

Further examination of sputum revealed thin, filamentous gram-positive bacilli, which were reported as *Actinomyces*. The case was discussed with microbiologist, as actinomyces infection was not consistent with patient’s clinical status. Sputum smear was further examined by using modified acid-fast stain, which revealed thin, filamentous, branching, gram positive and weakly acid-fast bacteria (Fig. 3) nocardia and confirmed on culture sensitivity report.

Pleural fluid was exudative neutrophilic and grew nocardia on culture. Serological examination was done in view of oral candidiasis, herpes-zoster and pleuropulmonary infection which showed patient being HIV positive by ELISA and Western Blot method, with low CD4 count (41 cells/μL) and high viral load 1,15,000 copies/mL. After re-evaluation, as per two neurophysicians opinion and based on electromyography and nerve conduction studies, he was diagnosed of having myasthenia gravis.

His diagnosis was confirmed as pleuropulmonary nocardiosis with myasthenia gravis in an immunocompromised patient due to steroids, azathioprine, and HIV status. The patient was switched over to oral trimethoprim-sulphamethoxazole (TMP-SMX) therapy to which the patient responded with a marked improvement after 72 hours of starting therapy, steroids and azathioprine
were continued, he was also started on highly active anti-retroviral therapy (HAART).

Discussion

_Nocardia_ is a genus of soil-borne aerobic actinomycetes that may produce local or disseminated infections in immuno-compromised people. The risk of pulmonary or disseminated disease is greater than usual among persons with deficient cell mediated immunity especially that is associated with lymphoma, organ transplantation, glucocorticoid therapy, or AIDS. In AIDS, nocardia usually affects person with < 250 CD4+ lymphocytes/μL. In the 1970s, a survey estimated the incidence of nocardiosis in the United States at 500-1000 cases per year (0.4 cases per 100,000 populations per year). However, with the increased prevalence of impaired cell-mediated immunity since then, the incidence of nocardiosis has likely also increased. T-cell-mediated immunity is the principal protective immune response to nocardiosis. Microbiological diagnosis is made by isolation of organism from site of infection. Organism is identified by using gram stain or modified acid-fast stain. Histopathological examination by using Gomori Methanamine Silver stain is also helpful.¹

Treatment of nocardial infection requires antimicrobial therapy for at least 6-months.⁴ Pulmonary or systemic nocardiosis requires treatment for 6-12 months in immunocompetent host whereas therapy is continued for 12 months in an immunodeficient host.¹ Drug of choice is sulphadiazine in a dose of 6-8 gm daily in divided dosages. Trimethoprim-sulphamethoxazole is an acceptable alternative to sulphadiazine. 10-15 mg/kg body weight of TMP and 50-75 mg/kg body wt of SMX should be given each day in divided doses. Alternative parenteral therapies include the carbapenem meropenem, third-generation cephalosporins (cefotaxime or ceftriaxone), and amikacin, alone or in combination. Meropenem plus amikacin may be the preferred regimen. Linezolid efficacy has been reported in a single case of nocardiosis.⁵ In patients who require immunosuppressive therapy, such therapy can generally be continued while appropriate specific therapy for nocardiosis is administered.⁶ Our patient also required immunosuppressive therapy for myasthenia which was continued, and as he was further diagnosed of having AIDS, he was given HAART too.

We conclude with a remark that clinicians must be aware of nocardia as one of the infections in an immunocompromised patient. High index of suspicion is required when an immunocompromised patient presents with lung infection and sputum is negative for AFB and sputum culture shows no growth of pathogenic bacteria.

Bibliography