
CASE REPORT**A case of pulmonary aspergillosis masquerading as pulmonary tuberculosis in a patient with type 2 diabetes mellitus***Sidharth Shankar Panigrahi¹, Jayshree Swain^{*}, Vejendla S Srinivas¹, K. Lavanya¹, Teli Brij Rajesh¹**¹Department of Endocrinology, IMS and SUM hospital, Bhubaneswar-751003 (Orissa) India*

Abstract

Patients with diabetes are more susceptible to infections than non-diabetics and often have severe clinical manifestations. The underlying immune dysregulations in these patients result in them developing serious, life-threatening infections. Pulmonary tuberculosis is a common respiratory infection seen in diabetics in India. However, there are certain rare yet life-threatening infections that can mimic pulmonary tuberculosis, like pulmonary aspergillosis. Pulmonary aspergillosis is seen in various immunocompromised patients. Rarely, it is also seen in diabetics with poor glycemic status. We present a case of pulmonary aspergillosis in a patient with type 2 diabetes who was undergoing treatment for pulmonary tuberculosis. His symptoms persisted despite anti tubercular therapy. Based on High Resolution Computed Tomography (HRCT) findings and the galactomannan assay in BAL fluid, patient was diagnosed to have probable pulmonary aspergillosis. He was started on anti-fungal therapy with subsequent improvement in his signs and symptoms. This case highlights the importance of considering fungal infections as an important differential in patients with diabetes with relevant pulmonary findings.

Keywords: Diabetes, Tuberculosis, Pulmonary Aspergillosis

Introduction

Diabetes increases susceptibility to several infections, which contribute to morbidity and mortality. The most common infections seen in diabetes are genitourinary tract infections, followed by respiratory tract infections. Among the respiratory infections, tuberculosis has been frequently documented [1]. Patients with diabetes are 3.1 times more likely to develop tuberculosis [2]. The incidence of multidrug resistant tuberculosis is 11% in an Indian-based study [3]. There are also some infections specific to the diabetic population like emphysematous pyelonephritis, emphysematous cholecystitis, rhinocerebral mucor mycosis, malignant otitis externa, and fungal pneumonia [1]. Though rare, life-threatening aspergillus infections can be seen in diabetics.

Aspergillus species are known to cause allergic

bronchopulmonary aspergillosis, chronic necrotizing pulmonary aspergillosis, aspergilloma, and invasive aspergillosis. More than 80% of cases of aspergillosis involve the respiratory system. *Aspergillus fumigatus* followed by *Aspergillus flavus* are common etiological agents. Chronic pulmonary aspergillosis occurs in immunocompromised states like haematological malignancy, neutropenia, and various non-malignant diseases like diabetes and Chronic Pulmonary Obstructive Diseases (COPD) [4]. Cases of chronic pulmonary aspergillosis occurring in fibro-cavitary lesions of pulmonary tuberculosis were documented. Here, we present a case of pulmonary aspergillosis in a patient with uncontrolled diabetes mellitus who was being treated for pulmonary tuberculosis.

Case Report

A fifty-five-year-old man with a history of type 2 diabetes for 7 years presented to the emergency department with a 4 months history of cough with expectoration, low-grade fever, shortness of breath, and haemoptysis for the past 20 days. He was started on anti-tubercular therapy based on chest imaging (figure 1), with a suspicion of pulmonary tuberculosis. His symptoms worsened despite the continuation of antitubercular therapy. He was a construction worker by profession, without any history of smoking or prior contact history with tuberculosis. Patient was on oral hypoglycaemic agents for the past 7 years. There was neither any history of long-term use of corticosteroids nor any history of past hospitalisation. On examination, he was a febrile with a pulse rate of 96 beats per min, respiratory rate of 22 per min, blood pressure of 130/80 mm of Hg and an oxygen saturation of 95% at room air. Chest examination revealed dullness and coarse crepitations in bilateral infra-scapular and left mammary areas. The rest of the systemic examination was normal. On evaluation, his random glucose was 346 mg/dl, HbA1c was 11.8%, creatinine was 1.59 mg/dl with Urine Albumin

Creatinine Ratio (UACR) of 4.95, procalcitonin of 0.93 ng/ml and ESR of 96 mm in first hour. His sputum was negative for Acid Fast Bacilli (AFB). Cartridge Based Nucleic Acid Amplification Test (CB-NAAT) for mycobacterium species also tested negative. In view of the worsening clinical condition, Bronchoalveolar Lavage (BAL) was done. Cytology and microbiological evaluation were negative for malignant cells, AFB, and Gram stain. However, BAL Galactomannan (BAL-GM) assay tested positive with a titre of 1.6. High Resolution Computed Tomography (HRCT) chest was suggestive of multiple areas of consolidation with fibro-cavitary changes in bilateral lung fields as shown in figure 2.

Based on HRCT findings and a positive BAL-GM assay, a probable diagnosis of pulmonary aspergillosis was made, and he was started on voriconazole (200 mg) twice daily. Glycemic control was achieved using basal bolus regimen. A detailed evaluation of diabetes related complications revealed non-proliferative retinopathy, distal symmetric peripheral neuropathy and nephropathy.

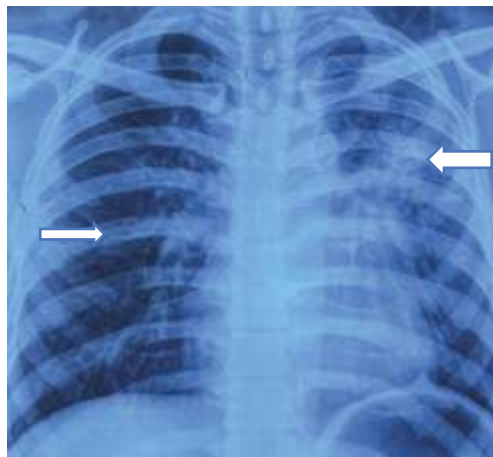


Figure 1: Chest radiography at presentation showing coarse nodular infiltrate with consolidation in left upper lobe as highlighted with the white arrow

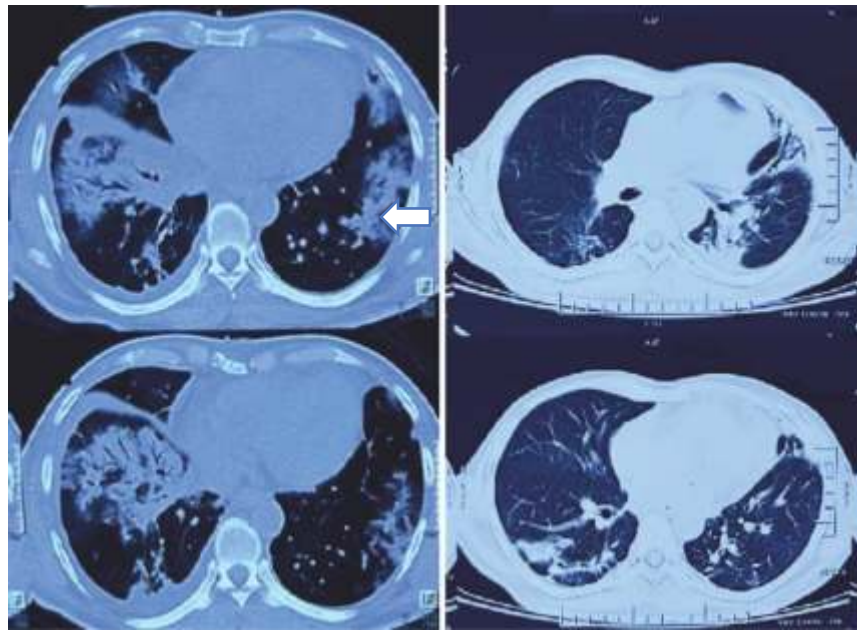


Figure 2a: HRCT thorax at presentation showing multiple areas of consolidation with fibro cavitary changes in anterior and posterior segment of bilateral inferior lobes of lung

Figure 2b: HRCT thorax after 2 months of voriconazole therapy

On follow-up after two months, his respiratory symptoms and general well being had improved. Repeat HRCT of the thorax was suggestive of resolution of the infection, as shown in figure 2b. His glycemc status had also improved.

Discussion

Pulmonary aspergillosis can be seen in various immunocompromised states. Clinical presentation can range from asymptomatic to florid symptoms of pneumonia. The median duration of symptoms before diagnosis has been shown to be around six months [5]. We encountered a rare case of pulmonary aspergillosis in which long standing uncontrolled type 2 diabetes was the only conceivable risk factor. The presence of diabetes related complications like retinopathy, neuropathy, and nephropathy at the time of presentation and a raised HbA1c suggest that the patient had a

prolonged period of hyperglycemia [6]. The incidence of proven and probable chronic pulmonary aspergillosis was 7.9% in patients with pulmonary tuberculosis. The small cavitary lesions in pulmonary tuberculosis allow the *Aspergillus* spores to colonize leading to the further formation of new cavities [7].

Infection due to *Aspergillus* species is often misdiagnosed as the clinical features might mimic tuberculosis. However, in our patient, both AFB stain for the sputum and the BAL aspirate were negative. Pulmonary aspergillosis should be considered a differential diagnosis if the patient fails to respond to anti tubercular therapy.

Pulmonary aspergillosis in our patient was diagnosed based on HRCT chest findings, and elevated GM level in the BAL fluid. GM assay in BAL fluid has a specificity of 85-90%, and a high

negative predictive value as compared to the serum values. The negative predictive value is 96 % at a titre of >0.5 [8]. Thus, classifying our patient as a probable case of pulmonary aspergillosis [5]. Patient was started on voriconazole 200 mg twice daily. The recommended treatment duration is variable ranging from 1 month to 1 year. Response to treatment is evaluated using clinical improvement, reduction in cavity size and pulmonary infiltrate which were evident in our patient after 2 months of therapy [9]. In very severe disease patients are usually started on intra venous voriconazole or amphotericin B.

Conclusion

Symptoms of pulmonary aspergillosis may mimic a tubercular infection. Pulmonary aspergillosis should be suspected in patients with diabetes when there is a progression of respiratory signs and symptoms despite antitubercular therapy. Hence, pulmonary aspergillosis should be considered as differential when dealing with a suspected drug resistant tuberculosis. Early diagnosis and appropriate anti-fungal therapy, along with optimisation of glycaemic status, are the keys to managing these patients.

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*Author for Correspondence:

Dr. Jayshree Swain, Department of Endocrinology, IMS and SUM hospital, Bhubaneswar- 751003, Orissa
Email: drjayshree_swain@yahoo.com
Cell: +919437271097

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