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Case Report

Unusual coexistence: Allergic bronchopulmonary aspergillosis and pulmonary tuberculosis- A rare case report

Laxmi Devi[1], Yogendra Narayan Verma[2], Ankit Kumar[3,*], Parul Sharma[1], Anees Ahmad[1], Shubham Chandra[1]

[1]*Dept. of Respiratory Medicine, Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur, Uttar Pradesh, India*
[2]*Dept. of Pathology, Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur, Uttar Pradesh, India*
[3]*Dept. of Respiratory Medicine, King George's Medical University, Lucknow, Uttar Pradesh, India*

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ABSTRACT

Introduction: Allergic Bronchopulmonary Aspergillosis (ABPA) is an allergic hypersensitivity reaction to the ubiquitous fungus Aspergillus that can cause inflammation and damage to the respiratory system. This condition predominantly occurs in individuals with long-standing airway disease, such as bronchial asthma or cystic fibrosis. While Acid-fast bacilli Mycobacterium tuberculosis causes tuberculosis (TB). ABPA and TB can coexist in the same patient. The coexistence of these two conditions can make the diagnosis and treatment more challenging. This is because some of the symptoms of ABPA, such as cough and wheezing, can be similar to those of TB, and both conditions can cause lung damage.

Case Report: A 21-year young male was admitted with a six-month history of low-grade fever, cough with expectoration, atypical chest pain, and progressive breathlessness. On examination, the patient had bilateral diffuse rhonchi with coarse crepitation, and his chest X-ray showed bilateral heterogeneous opacities with cavities in the left upper and middle zone. Further evaluation revealed a total serum IgE of 3074 IU/L (Normal <100) and elevated levels of Aspergillus fumigatus-specific IgE and IgG. A high-resolution CT of the thorax revealed bilateral upper lobes with tree-in-bud opacities and centrilobular nodules, leading to a diagnosis of ABPA. A sputum sample was sent for an AFB smear, which was positive.

Discussion: Allergic bronchopulmonary aspergillosis (ABPA) is a hypersensitivity reaction to Aspergillus fumigatus that most commonly affects people who have bronchial asthma or cystic fibrosis. However, diagnosis can be challenging as patients may not respond to standard treatment, and the symptoms can overlap with those of other respiratory diseases. Therefore, clinicians need to maintain a high index of suspicion for ABPA in at-risk patients and consider appropriate screening tests.

This case highlights the rare co-existence of active pulmonary TB and ABPA, which can make diagnosis and treatment challenging. However, with appropriate management, including anti-tubercular treatment and corticosteroid therapy, the patient showed marked improvement in his condition. Clinicians should consider the possibility of multiple comorbidities in patients presenting with respiratory symptoms, and appropriate evaluation and management should be undertaken to achieve optimal outcomes.

1. Introduction

Allergic bronchopulmonary aspergillosis (ABPA) is an allergic hypersensitivity reaction to the ubiquitous fungus Aspergillus that can cause inflammation and damage to the respiratory system. This condition predominantly occurs

* *Corresponding author*.
E-mail address: ankyar007@gmail.com (A. Kumar).

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in individuals with long-standing airway disease, such as bronchial asthma or cystic fibrosis.[1,2] While Acid-fast bacilli Mycobacterium tuberculosis causes tuberculosis (TB). Tuberculosis primarily affects the lungs but can also affect various other organs. India bears about one-fourth of the global disease burden.[3]

ABPA and TB can coexist in the same patient. The coexistence of these two conditions can make the diagnosis and treatment more challenging. This is because some of the symptoms of ABPA, such as cough and wheezing, can be similar to those of TB, and both conditions can cause lung damage. The majority of reported cases of ABPA among tubercular patients are among previously treated patients,[4] with the remainder being cases of ABPA misdiagnosed as pulmonary tuberculosis.[5] While the presence of ABPA in patients with active pulmonary tuberculosis is uncommon.

Additionally, the treatment for ABPA typically involves the use of corticosteroids, which can suppress the immune system and increase the risk of TB reactivation in patients with latent TB infection. Therefore, it is essential to diagnose and treat both conditions appropriately to avoid complications and ensure a successful outcome.

Here we report a rare case of a 21-year-old male who was diagnosed with both active pulmonary TB and ABPA simultaneously, making it the third reported case of its kind. The previous cases were documented by Min et al[6] and Purohit et al.[7]

This case highlights the challenges of diagnosing and managing two conditions with overlapping symptoms, such as cough and wheezing. It also underscores the importance of considering the possibility of multiple comorbidities in patients with respiratory symptoms.

2. Case Report

A 21-year young male was admitted with a six-month history of low-grade fever, cough with expectoration, atypical chest pain, and progressive breathlessness (mMRC grade 1 progressing to mMRC grade 4). He was a plastic factory worker by occupation and a non-smoker, with no significant medical history or risk factors. On examination, the patient had bilateral diffuse rhonchi with coarse crepitation, and his chest X-ray showed bilateral heterogeneous opacities with cavities in the left upper and middle zone (Figure 1). He had a heart rate of 130/min and respiratory rate of 32/min, which prompted admission to the hospital.

Further evaluation revealed a total serum IgE of 3074 IU/L (Normal <100) and elevated levels of Aspergillus fumigatus-specific IgE and IgG. A high-resolution CT of the thorax revealed bilateral upper lobes with tree-in-bud opacities and centrilobular nodules (Figure 2), leading to a diagnosis of ABPA. As a routine practice in our hospital, his sputum sample was sent for AFB smear, which was positive (Figure 3). The rifampicin-sensitive Mycobacterium tuberculosis was detected by the cartridge-based nucleic acid amplification test (CBNAAT), and Aspergillus fumigatus was confirmed by sputum culture.

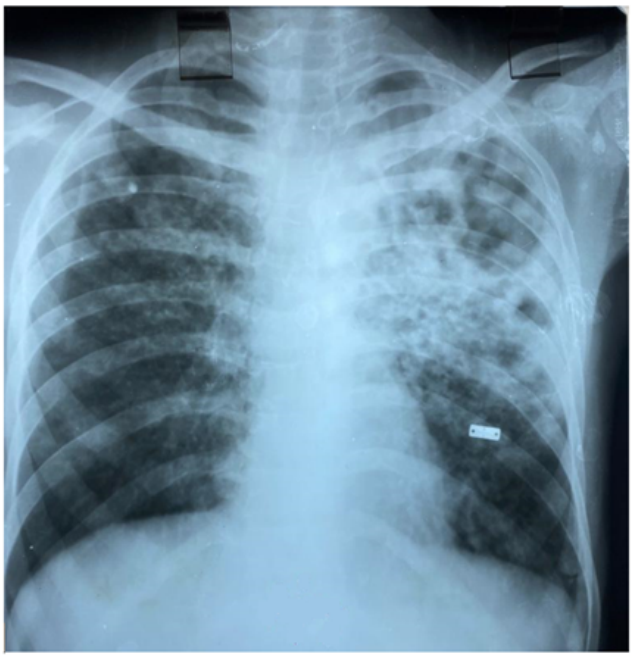

Fig. 1: X-ray showed bilateral heterogeneous opacities with cavities in the left upper and middle zone

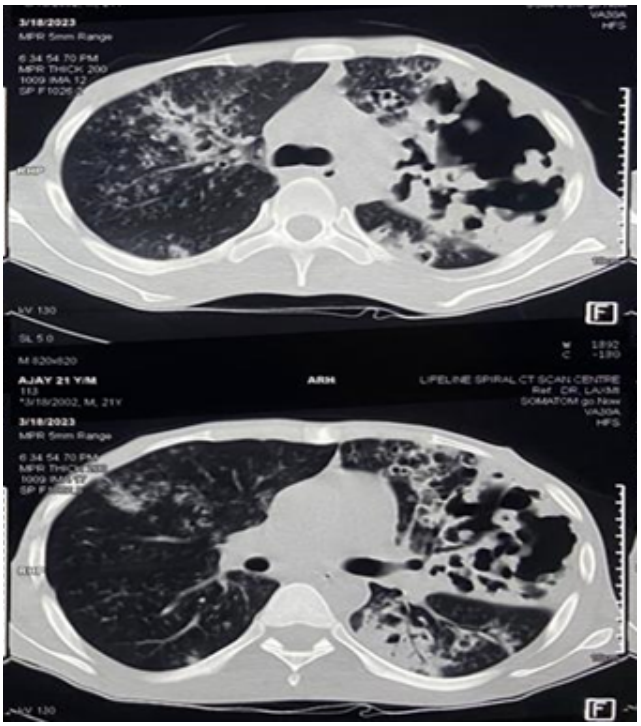

Fig. 2: CT thorax showing necrotizing pneumonia, tree-in-bud appearance and bronchiectasis.

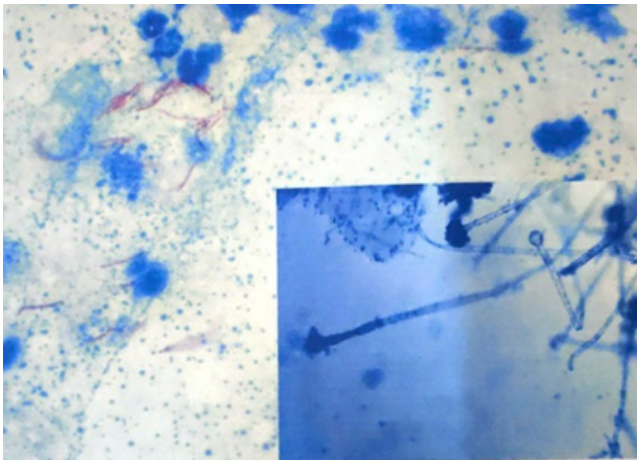

Fig. 3: Smear shows curved rod-shaped Acid fast slender bacilli along with conidia of aspergillus species.

The patient was started on anti-tubercular treatment on a drug-sensitive tuberculosis regimen and prednisolone therapy at a dose of 0.75 mg/kg for 6 weeks, with a plan to continue for a total duration of 9 months while tapering the doses. The patient showed significant clinical improvement in his condition, and follow-up chest X-ray and CT scan showed radiological clearing. The patient's oxygenation and clinical status improved markedly, and he is currently under regular follow-up at our outpatient department with no significant limitations.

In this case, the patient was successfully treated with antifungal therapy for ABPA and anti-tuberculosis medication for TB. However, it is important to note that the treatment of one condition, such as the use of corticosteroids for ABPA, can increase the risk of reactivation of TB in patients with latent TB infection. Therefore, the treatment plan must be carefully managed to prevent complications.

3. Discussion

Allergic bronchopulmonary aspergillosis (ABPA) is a hypersensitivity reaction to Aspergillus fumigatus that most commonly affects people who have bronchial asthma or cystic fibrosis.[8] In Western countries, the prevalence of ABPA has been reported to be 6-12.9 per cent in referral centres, indicating that it is not a rare condition.[9,10] However, diagnosis can be challenging as patients may not respond to standard treatment, and the symptoms can overlap with those of other respiratory diseases. Therefore, clinicians need to maintain a high index of suspicion for ABPA in at-risk patients and consider appropriate screening tests.

ABPA is typically diagnosed based on clinical suspicion and a combination of laboratory and radiological tests. Aspergillus fumigatus-specific IgE has been proposed as an ABPA screening test followed by a skin test if IgE is negative and clinical suspicion is high. Blood eosinophil count and total serum IgE levels are also useful in the evaluation of ABPA. Radiological findings in ABPA patients include migratory pulmonary infiltrates, central bronchiectasis, sub-segmental or segmental collapse, and centrilobular nodules.[11]

In tuberculosis-endemic settings, misdiagnosis of ABPA as tuberculosis and vice versa is not uncommon. This is due to the overlapping symptoms and radiological findings of both conditions. Moreover, the immune imbalance in ABPA, which is predominantly driven by Th2 CD4 lymphocytes, can increase susceptibility to mycobacterial infections, while protective immunity against tuberculosis is driven by Th1 CD4 lymphocytes.[12,13]

This case highlights the rare co-existence of active pulmonary TB and ABPA, which can make diagnosis and treatment challenging. However, with appropriate management, including anti-tubercular treatment and corticosteroid therapy, the patient showed marked improvement in his condition. Clinicians should consider the possibility of multiple comorbidities in patients presenting with respiratory symptoms, and appropriate evaluation and management should be undertaken to achieve optimal outcomes.

Therefore, it is essential to rule out active pulmonary tuberculosis before starting corticosteroid therapy for ABPA to prevent the dissemination of underlying tuberculosis. Sputum microscopy should be used to rule out active tuberculosis in all ABPA cases. This case highlights the importance of carefully evaluating patients with respiratory symptoms for coexisting conditions, particularly in endemic areas. Before beginning corticosteroid therapy, clinicians should maintain a high index of suspicion for ABPA in at-risk patients and rule out active pulmonary tuberculosis.

4. Source of Funding

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5. Conflict of Interest

None.

6. Acknowledgement

None.

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Author biography

Laxmi Devi, Assistant Professor

Yogendra Narayan Verma, Associate Professor

Ankit Kumar, Assistant Professor https://orcid.org/0000-0003-0688-7880

Parul Sharma, Junior Resident

Anees Ahmad, Senior Resident

Shubham Chandra, Junior Resident

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