

**PULMONARY ASPERGILLUS OVERLAP SYNDROME-ALLERGIC BRONCHO
PULMONARY ASPERGILLOSIS WITH ASPERGILLOMA**Riya Varghese^{1*}, Rona Mariam Chacko², Dr. Luke Mathew³, Dr. Stephen Sunny⁴^{1,2}Pharm D Intern, Nazareth College of Pharmacy, Othara, Thiruvalla.³Senior Consultant and HOD, Department of Pulmonology, Believers Church Medical College Hospital, Thiruvalla.⁴Senior Resident, Department of Pulmonology, Believers Church Medical College Hospital, Thiruvalla.***Corresponding Author: Riya Varghese**

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ABSTRACT

Aspergillus overlap syndromes refer to the occurrence of multiple forms of Aspergillus-related diseases within a single individual. These diseases are caused by various species of the Aspergillus fungus. The main categories of pulmonary aspergillosis include chronic forms of aspergillosis, allergic bronchopulmonary aspergillosis (ABPA), and invasive aspergillosis. Overlap syndromes can occur when an individual has a combination of these forms of aspergillosis or experiences transitions between them. For example, a person with asthma may develop ABPA and later progress to chronic forms like CPA if not appropriately treated or managed. Effective management and treatment require a thorough understanding of the specific forms of aspergillosis the individual is experiencing and tailored medical interventions to address their unique situation. We present the case of a 61-year-old gentleman, who developed ABPA with aspergillosis. We assessed the cause and it was found that he had pulmonary tuberculosis in the past.

KEYWORDS: Pulmonary Aspergillus overlap syndrome; Allergic bronchopulmonary aspergillosis; Smear Positive Pulmonary Tuberculosis; Relapse.

INTRODUCTION

Allergic bronchopulmonary aspergillosis (ABPA) is a hypersensitivity reaction to the presence of Aspergillus in the airways. It primarily affects individuals with asthma or cystic fibrosis. The immune system's response to Aspergillus can cause a range of symptoms such as wheezing, coughing, breathlessness, and sometimes fever. Long-term exposure to Aspergillus can lead to lung damage.

CASE REPORT

A 61-year-old gentleman diagnosed with Allergic Broncho Pulmonary Aspergillosis with Aspergilloma and Infective Exacerbation was admitted to our hospital in the Pulmonology department with complaints of fever, cough, and breathlessness. The patient had a past medical history of Type II diabetes mellitus and was on oral hypoglycemic agents. He had Smear Positive Pulmonary tuberculosis (CATEGORY 1 DOTS) and completed 6 months of ATT under RNTCP in the year 2011. He was treated for lung abscess in 2012. Later on, a Relapse of Pulmonary Tuberculosis occurred in 2015, and he was Sputum Positive. He followed CATEGORY II ATT under RNTCP DOTS. Unfortunately, the patient had a second Relapse of Pulmonary Tuberculosis in 2017. The Bronchoalveolar lavage (BAL) GeneXpert

analysis was done and was found to be positive and he was started on CATEGORY II ATT under RNTCP.

HRCT Thorax showed fibrosis with bronchiectatic cavities and para-cicatricial emphysematous changes in bilateral apical segments. The cavity in the apical segment of the right upper lobe shows mildly thickened hyperdense walls with adjacent lung parenchymal collapse, pleural thickening, and heterogeneous internal contents. Sputum investigations were done, which showed no evidence of Mycobacterium Tuberculosis. Also in view of the normal absolute neutrophil count, total IgE was sent which came as highly elevated (>3200UI/ml). Hence serum IgE, IgG-specific aspergillus, and Galactomannan were sent and the reports were suggestive of Allergic Bronchopulmonary Aspergillosis. Hence patient was started on oral steroids.

PFT was done again and it showed moderate restriction, Severe Airway Obstruction without Reversibility. Sputum culture yielded moderate growth Pseudomonas aeruginosa and antibiotics were given as per sensitivity. The patient improved must be lessened nebulisations were tapered down and switched to MDI. Foracort. The patient became hemodynamically and clinically stable and was discharged with the advice to continue IV antibiotics for 5 more days from a nearby hospital.

DISCUSSION

Pulmonary tuberculosis (PTB) is a type of tuberculosis that primarily affects the lungs. It is the most common form of tuberculosis. Patients with PTB often experience respiratory symptoms such as dry cough, cough with sputum (which may contain blood), and shortness of breath (SOB). Additionally, systemic constitutional symptoms can include fever, night sweats, and weight loss. When PTB is suspected, the diagnosis involves various tests like Sputum Microscopy for Acid-Fast Bacilli, Molecular or Nucleic Acid Amplification Test (NAAT), Culture, and Flexible Bronchoscopic Sampling. In the above case for the confirmation of Diagnosis, Extensive TB work-up was initiated, and bronchoalveolar lavage (BAL) TB samples were obtained during flexible bronchoscopic sampling. These BAL samples confirmed the diagnosis of PTB.

Aspergillus infections can become pathogenic and have severe consequences, especially when they occur in the context of pulmonary tuberculosis (PTB) or secondary TB. In cases of PTB, particularly secondary TB, patients may develop cavitory lesions within their lungs. These cavities are areas of lung tissue destruction and necrosis caused by the TB infection. These cavities can serve as vulnerable sites for Aspergillus infection. The small cavitory lesions provide a conducive environment for Aspergillus spores to colonize and grow.

Once Aspergillus spores colonize the cavitory lesions, they can proliferate and lead to the expansion or creation of new cavities within the lung. This colonization and growth of Aspergillus within the lung cavities can further exacerbate tissue destruction, leading to severe damage and complications for the affected individual.

CONCLUSION

We conclude that our patient with Pulmonary Tuberculosis developed Pulmonary Aspergillus Overlap Syndrome due to the presence of Aspergillus fumigatus in the residual tuberculosis cavities. It has the potential for other pathogenic infections due to its sufficient oxygen and necrotizing tissue. Thus, it is important for a person especially with lung disease, to avoid close contact with soil or dust and prevent concomitant infections.

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CONFLICTS OF INTEREST: There are no conflicts of interest.

ABBREVIATIONS

ABPA - Allergic Bronchopulmonary Aspergillosis
CPA – Chronic Pulmonary Aspergillosis
RNTCP – Revised National Tuberculosis Control Programme
DOTS – Directly Observed Treatment, Short-course
ATT – Anti-Tuberculosis Drugs
BAL – Broncho Alveolar Lavage
IgE – Immunoglobulin E
MDI – Metered-dose inhaler
PTB – Pulmonary Tuberculosis
SOB – Shortness of breath
NAAT - Nucleic Acid Amplification Test

REFERENCES

1. Jitendra Sisodia, Tushar Bajaj. Allergic Bronchopulmonary Aspergillosis. [Updated 2023 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing, 2023 January.
2. Li, L., Jiang, Z. & Shao, C. Pulmonary Aspergillus Overlap Syndromes. Mycopathologia, 2018; 183: 431–438.
3. Hedayati, M.T., Azimi, Y., Droudinia, A. et al. Prevalence of chronic pulmonary aspergillosis in patients with tuberculosis from Iran. Eur J Clin Microbiol Infect Dis, 2015; 34: 1759–1765.
4. Baluku JB, Nuwagira E, Bongomin F, Denning DW. Pulmonary TB and chronic pulmonary aspergillosis: clinical differences and similarities, 2021 Jul 1; 25(7): 537-546.
5. Lapham Me. Aspergillosis of the Lungs and its association with Tuberculosis. Jama, 1926; 87(13): 1031–1033.