Allergic Bronchopulmonary Aspergillosis (ABPA) – Asthma on the tip of iceberg

Harshpreet Singh Tuteja[1,*], Sourya Acharya[2], Samarth Shukla[3]

[1]Resident, [2,3]Professor, Jawaharlal, Nehru Medical College, Datta Meghe University of Medical Science, Wardha, Maharashtra

***Corresponding Author:**
Email: harshpreets21@gmail.com

Abstract:
Allergic Bronchopulmonary Aspergillosis (ABPA) is one of the rare presentations of fungus Aspergillus fumigatus. Apart from ABPA two other manifestations are aspergilloma and aspergillus asthma. ABPA classically presents as central bronchiectasis which is not seen in asthma. We present a case of ABPA masquerading as chronic asthma. This case highlights on the bizarre presentations of ABPA. Weather it presents primarily with symptoms of asthma, or it can present itself superimposed on clinical asthma. The dilemma begins when ABPA presents with asthma without any radiologic evidence. Usually these cases are initially treated as asthma only, later on when the symptoms are not improved with proper asthma therapy and/or till they develop radiologic abnormality.

Keywords: ABPA; Aspergilloma; Asthma; Radiologic.

Introduction:
Aspergillosis is an infection caused by the fungus Aspergillus fumigatus. It encompasses different forms of respiratory and systemic manifestations. The different forms are invasive pulmonary aspergillosis, allergic pulmonary aspergillosis, chronic cavitary, semi-invasive aspergilloma, severe asthma with fungal sensitization (SAFS).

ABPA is a condition where a patient develops allergy to the spores of the Aspergillus moulds. Predominantly, it affects patients of asthma, cystic fibrosis and bronchiectasis. One to five percent of adult asthmatics and COPD patients might develop ABPA at some time during their lives. The clinical presentation of ABPA usually resembles that of atypical asthma, so a high index of suspicion is required for confirming the diagnosis of ABPA [1]. The first three cases of ABPA from India were reported in 1971. Then it was followed by sporadic cases and finally from different parts of the country, suggesting that it was not a common entity [2-7].

This case is unique in the sense that, the patient had been treated as asthma since nine months. Previous chest X-ray which was done 5 months back did not show any bronchiectatic change. The question arises that whether ABPA was superimposed on a previously asthmatic patient or, it had been there from the very beginning without classical X-ray findings is debatable. Because of the normal chest X-ray the patient might have not been investigated further. Abnormal chest X-ray in this hospital prompted the diagnosis.

Case Report:
A 40 years old female presented to us with chief complaints of fever, cough with expectoration and wheezing of 10 days duration. There was no history of allergy, hemoptysis, chest pain. Patient gave a history of on and off wheezing since nine months. Past history was significant for intermittent fevers with cough which usually subsided with antibiotics. Five months back the patient was advised chest X-ray (CXR) by some private practitioner but that was normal.

On examination: Pulse- 96/min, regular, BP - 108/78 mm of Hg, RR was 20 cycles/min, bilateral clubbing of fingers (grade 3) present, there was no cyanosis. Respiratory system examination revealed bilateral scattered coarse crepitation's and wheezes. Other system examination was normal.

Investigations revealed Hb-11.2gm%, WBC-10,200/mm3 with eosinophils-25%, absolute eosinophil count – 950 cell/micro liters, platelet count- 3.2 lacks. Diethylcarbamazine challenge test was negative for microfilaria. ELISA for HIV was negative. PFT showed obstructive pattern. HRCT thorax revealed central bronchiectasis with ground glass and nodular pulmonary infiltrates (Figure 1, 2). Aspergillus fumigatus specific IgE levels- 518 (significant when > 417 IU/mL) A diagnosis of ABPA was made and the patient was started with oral Prednisolone 40 mg/day which was tapered over one month to 5 mg/day, inhaled bronchodilators and Tab. Itroconazole 200 for four months.

Patent was fairly stable in the first month follow-up. Asthma symptoms and cough were significantly reduced

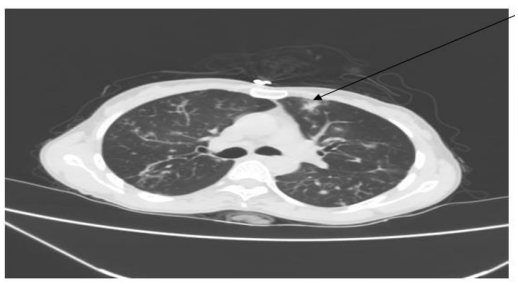

Fig. 1: Nodule with ground glass opacity

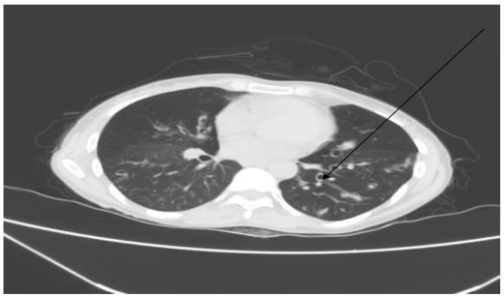

Fig. 2: Central Bronchietasis

Figure 1, 2; HRCT thorax showing ground glass and nodular pulmonary infiltrates and central bronchiectasis

Discussion:

ABPA is a form of hypersensitivity to Aspergillus species, which affects the tracheobronchial tree causing asthma [8]. Asthma predisposes to the development of ABPA and about 1-2% of all asthmatic patients present with ABPA [9,10]. Though considered to be rare in India [11], two studies reported the prevalence of ABPA as 16% and 7.5% respectively [12,13].

Criteria for the Diagnosis of ABPA

1. Seropositive ABPA (ABPA-S)

History of Asthma (often difficult to control)
Elevated total serum IgE (usually >1000 IU/ml)
Immediate skin test reactivity to Aspergillus fumigatus.
Elevated specific serum IgE to Aspergillus fumigatus.
Presence of serum precipitins or elevated specific serum IgG to Aspergillus fumigates.

2. ABPA central bronchiectasis (ABPA-CB)

Above criteria PLUS Central bronchiectasis by high resolution CT scan.

3. Other supportive clinical findings

Peripheral blood eosinophilia (often absent especially if patient is on oral corticosteroids)
Patchy, fleeting infiltrates (often absent especially if patient is on oral corticosteroids)
Expectoration of brown mucus plugs, Mucoid-impacted bronchi evident on radiographic
Studies, Sputum culture positive for Aspergillus fumigatus [14-15].

Stages of ABPA.

Stage I: Acute

Acute asthma symptoms, Elevated serum IgE (>1000 IU/ml), peripheral blood eosinophilia (may be absent in patients treated with oral corticosteroids), Fleeting infiltrates on chest x-ray (may be absent in patients treated with oral corticosteroids), Positive specific IgE, IgG, skin test reactivity, and precipitins to A. fumigatus, responds to steroids/antifungal therapy.

Stage II: Remission

Resolution of symptoms, resolution of pulmonary infiltrates improvement in eosinophilia and A. fumigatus specific blood abnormalities.

Stage III: Exacerbation/recurrence

Recurrence/worsening of clinical symptoms, recurrent pulmonary infiltrates, rising IgE levels

Stage IV: Steroid-dependent-asthma

Refractory steroid-dependent asthma, persistently elevated serum IgE levels, persistently elevated A. fumigatus–specific blood abnormalities.

Stage V: Fibrotic lung disease

Refractory steroid-dependent asthma, Fibrotic lung disease (irreversible obstructive and restrictive defects with impaired diffusing capacity), Chronic bronchiectasis symptoms(sputum production, frequent infections).

Radiologic and HRCT features:

Radiologic presentation can be broadly divided into, into transient and permanent shadows. Transient lesions are due to parenchymal infiltrates, and usually clear with or without glucocorticoid therapy and are not considered pathognomonic of ABPA. The involvement occurs usually in the upper lobes. The transient changes include perihilar infiltrates, air-fluid levels and massive unilateral or bilateral consolidation. They are sometimes known as 'fleeting-shadows" because the infiltrates change from time to time in serial CXRs [16-17].

The characteristic radiologic feature of ABPA is central bronchiectasis with normal peripheral bronchi. Bronchiectasis on HRCT has been described as the 'string of pearls' or 'signet ring' appearance. High-attenuation mucus has been described as most characteristic finding of ABPA [18-20].

Therapy is long Prednisone remains the mainstay of therapy for control and stability of ABPA [15,21]. The symptoms of asthma are controlled by anti-inflammatory and bronchodilator therapy. Antifungals (Ketoconazole, Fluconazole and Itraconazole) retard the growth of fungal mycilia within the bronchial tree [22,23]. Our patient had asthma, peripheral blood eosinophilia. increased IgE (>417 IU/mL), to A. fumigates and central bronchiectasis in HRCT confirming the diagnosis of ABPA. He responded to the therapy with oral prednisolone and Itroconazole [24,25].

Conclusions:

A high index of suspicion is required to establish the diagnosis of ABPA. Asthmatics who have type I cutaneous reaction positive to Af antigen, should be investigated for ABPA. Bronchial asthma patients who respond poorly to adequate asthma therapy, have systemic illness, and/or history of expectorating golden brownish plugs should be further investigated for ABPA. ABPA should be strongly suspected and excluded in asthmatics having radiological infiltrates or central bronchiectasis and blood eosinophilia.

Conflicts of interest: None declared
Acknowledgements: None

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