

Youngest patient of ABPA in Indian Subcontinent — A Case Report

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Abstract

Allergic bronchopulmonary aspergillosis (ABPA) was described in a 15 months old child with accepted criteria of clinical, radiologic and serological parameters. The patient developed mucoid colonization with *Pseudomonas aeruginosa* and ultimately died at the age of 7 years due to mosaic hemoptysis inspite of proper treatment for ABPA.

Key words: ABPA-S, ABPA-CB, ABPA-ORF, *Pseudomonas aeruginosa*, Ketoconazole, Itraconazole

INTRODUCTION

Allergic bronchopulmonary aspergillosis (ABPA) was first described as a clinical entity by Hinson and colleagues¹ in 1952. ABPA, relapsing lung disease occur predominantly in asthma patients, ranging from mild asthma to fatal destructive lung disease. The disease is caused primarily by hypersensitivity to colonized *Aspergillus fumigatus*¹⁻³ ABPA has now been recognized as a disease with worldwide distribution.² In India it was first reported in 1971 by Shah and colleagues.⁴ Since then, several cases have been documented in Indian adult population⁵⁻¹⁴, but only few reports are there on Indian pediatric population.^{15,16}

This report describes the youngest case of ABPA from Indian subcontinent fulfilling the diagnostic criteria^{17,18} for the clinical entity, its follow up and resemblance to cystic fibrosis.

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Case Report

This female child was well till the age of 1.25 yrs and then developed paroxysmal cough which was managed by family physician with antibiotics and bronchodilator. Her x-ray was normal till that time. She was referred to our Institute when suffered with high grade of fever and bilateral wheezing at the age of four years. She was full term normally delivered child and has received all the vaccinations. None of the development milestones were delayed. There was no significant medical or surgical problem in the past.

Physical examination revealed a thin built, young girl with mild respiratory distress. There was no cyanosis or clubbing. Bilateral rhonchi were present on chest auscultation. Chest roentgenograms (posteroanterior and lateral views) revealed transient pulmonary opacities. Bronchography showed bilateral areas of central bronchiectasis with normal tapering of distal airways.

Total leucocyte count was 10900/mm³ with 20% eosinophils. Pulmonary function test showed forced expiratory volume of 65.2% of predicted value in the

first second and forced vital capacity as 45.3% of predicted. Mantoux test was negative with one tuberculin unit of purified protein derivative. Several sputum specimens for direct smear examination and culture for *Mycobacterium tuberculosis* were negative. Mycological investigation of sputum showed a number of septate hyphal fragments of *Aspergillus* and culture of the same sample yielded *Aspergillus fumigatus*. Gel diffusion studies detected strong bands of serum precipitins against *Aspergillus fumigatus*. Intradermal test with extract of *Aspergillus fumigatus* (1:500w/v) gave strong type I as well as type III reactions. Specific IgG and IgE against *Aspergillus fumigatus* were elevated compared to normal control. Repeated blood examinations also revealed persistent peripheral eosinophilia. Bronchoscopy done under anesthesia revealed thick inspissated mucus collected in the right main bronchus. Thus a diagnosis of ABPA was established.

Treatment with antifungal drugs namely ketoconazole and steroids was given and her symptoms were controlled. The serial skigrams of chest demonstrated clearance of opacities but patchy fibrosis distributed irregularly in both fields persisted. Keeping in view the fibrosis in both the lungs, sweat chloride test was done twice which was found within normal limits. At seven years of age she developed massive hemoptysis. Sputum for pyogenic organisms showed encapsulated form of *Pseudomonas aeruginosa* in two subsequent samples. Chest skiagram showed multiple cystic opacities bilaterally along with a cavity in right lower lung. Antipseudomonal drugs were started with other supportive treatment. Though the colony count reduced markedly, encapsulated form of *Pseudomonas* sp. persisted in spite of regular antipseudomonal treatment. After six months she developed severe hemoptysis and was taken to a nearby hospital where massive pseudomonal growth was observed. She was given similar treatment as above, but she succumbed to hemoptysis.

The idea of reporting the case was that ABPA can manifest as early as the age of 4 yrs in spite of proper treatment. The fibrosis can develop, and extensive fibrosis can be associated with *Pseudomonas* colonization like cystic fibrosis and may be fatal or nearly fatal.

DISCUSSION

The spectrum of *Aspergillus*-associated respiratory disorders range from saprophytic colonization of respiratory tract to rapidly invasive disseminated disease. ABPA is the most frequently recognized manifestation of allergic aspergillosis.² It usually occurs in people in their twenties and thirties¹⁹ but the diagnosis in childhood is crucial to prevent destruction of lungs. V.P. Chest Institute, Delhi is a referral Chest Hospital. Here we see many children with severe bronchial asthma and many of them require steroids to control their symptoms. In such cases one should suspect and look for ABPA.

Slavin et al²⁰ reported first childhood case of ABPA in a nine year old Caucasian girl from United States in 1970. Since then, a number of childhood cases of the disease including infants have been reported from Western world.²⁰⁻²³ But only a few reports of childhood ABPA have been documented from Indian subcontinent.^{15,16} Chetty et al¹⁶ investigated 107 children with bronchial asthma and found that 35 of them had ABPA. They specifically mentioned that the maximum number of patients were in early adolescence. In 1993, Shah et al¹⁵ reported ABPA with cubbing and cavitation in an adolescent boy aged 11 yrs. We could not find any reported case from India in infancy or preschool age group even after extensive search of the literature. Thus, our 4 yrs old patient appears to be the youngest ABPA case reported from Indian subcontinent.

ABPA is an indolent disease with a protracted course. It is characterized by repeated episodes of exacerbations, interspersed with periods of remissions. If untreated, it progresses to fibrotic lung disease resembling the chronic fibrocavitary disease of pulmonary tuberculosis.¹⁹ However in a follow up of a case of ABPA for 23 years, it was observed that in spite of proper treatment, disease progressed from acute exacerbation (stage I) to fibrosis (stage IV)²⁴. Different stages of ABPA have been noted, namely acute, remission, recurrence, steroid dependent and fibrotic. They represent ABPA-S (Serological Positive), ABPA-CB (Central Bronchiectasis) and ABPA-CB-ORF (Central Bronchiectasis with other radiological features).^{25,26} Steroids are mainstay of treatment of ABPA. Itraconazole has been tried in

some patients with encouraging results.²⁷ It is thought that once the disease is recognized and treatment is commenced, progression to fibrotic lung disease could possibly be prevented.²⁸ But in this case in spite of proper treatment, extensive fibrosis developed.

Moreover, like cystic fibrosis where extensive lung fibrosis with *Pseudomonas* colonization is quite common²⁹, ABPA with extensive fibrosis can also show colonization with *Pseudomonas*.³⁰ In present case heavy colonization with *Pseudomonas* was noted. However, cystic fibrosis was excluded by repeated sweet chloride test. In conclusion, a youngest case of ABPA was reported from India. Patient developed fibrosis inspite of proper treatment and the extensive fibrosis lead to massive colonization of *Pseudomonas* resembling cystic fibrosis.

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