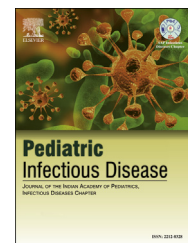


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Case Report

Life threatening allergic bronchopulmonary aspergillosis (ABPA) in well child due to acute exposure to pulse infested with *Aspergillus flavus*

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ARTICLE INFO

Article history:

Received 23 February 2013

Accepted 29 August 2013

Available online xxx

Keywords:

Allergic bronchopulmonary aspergillosis

Acute respiratory failure

Spores inhalation

ABSTRACT

ABPA is an uncommon condition, affecting abnormal lungs and not routinely considered life-threatening. We report a well 14-year-old boy progressing to respiratory failure following exposure to fungal infested grains, causing severe life-threatening bronchospasm. Such an acute severe presentation of ABPA in a previously well child has not been reported before.

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1. Introduction

Sensitization to a number of fungi including *Aspergillus* spp. is commonly found in atopic individuals and is associated with increased asthma severity. Airborne conidia enter the human host via inhalation or inoculation. An increase in the environmental load of conidia leads to increased risk of disease. Most common species is *Aspergillus fumigatus* leading to ABPA.¹ We report a boy, who did not have underlying asthma or cystic fibrosis, and was immunocompetent, had life-threatening bronchospasm following exposure to *Aspergillus flavus* infested grains, needing mechanical ventilation.

2. Case report

We report a case of 14 years old previously healthy boy with seasonal allergic rhinitis, with no history of breathlessness or wheezing. Green pulse grains (moong dal) was brought from fields to home, he started having mild cough, next day he helped his father in sorting and cleaning the grains in evening as these were spoiled after rains. Early morning next day he complained of pain and tightness in the chest and difficulty in breathing, he was taken to local doctor but he started becoming drowsy with marked respiratory distress, was referred to DMCH. At admission he was in respiratory failure,

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<http://dx.doi.org/10.1016/j.pid.2013.08.004>

severely hypoxic with almost silent chest, given continuous nebulization with salbutamol (0.15 mg/kg every 20 min), IV hydrocortisone (5 mg/kg 6 hourly). He was having gasping efforts, with use of accessory muscles; also IV terbutaline infusion was started (increased gradually to 3.0 mcg/kg/min), followed by aminophylline infusion (0.9 mg/kg/h) due to minimal improvement. Chest X-ray showed hyperinflated lungs with tubular heart (Fig. 1). He continued to deteriorate, ABG showed acute respiratory acidosis, so was intubated and put on ventilator, SIMV pressure control. He needed fentanyl sedation (1–3 mcg/kg/min), ketamine infusion (1 mg/kg/h) and vecuronium (50 mcg/kg/h). His oxygenation was alright but ventilation continued to be a problem and he was ventilated using permissive hypercapnia with high pressure requirements. He was also given ceftriaxone (75 mg/kg) and azithromycin (10 mg/kg) od for 5 days. Non-bronchoscopic bronchoalveolar lavage (BAL) specimen showed no growth of pyogenic organism. After overnight incubation with 10% KOH mount of BAL sample, hyaline septate with dichotomous branching consistent with *A. flavus* was seen (Fig. 2a).

Patient was started on voriconazole (4 mg/kg IV 12 hourly then 2 mg/kg IV 12 hourly followed by 100 mg orally) for total 10 days. He needed manual chest decompressions with physiotherapy and on suction of the endotracheal tube, thick mucus plugs used to come improving his ventilation temporarily only. Gradually with same pressures, his tidal volume started improving and PIP was brought down, his FiO₂ was kept <0.6. He was weaned off gradually and extubated on day 5, had normal gases. Infusions were also stopped and started on nebulizations. He remained afebrile throughout his stay and his routine investigation including complete hemogram, renal function tests, liver function tests were normal. His IgE levels specific for *Aspergillus* were high (638 IU/l), HIV Non-reactive. Unfortunately skin prick test was not available and so could not be done.

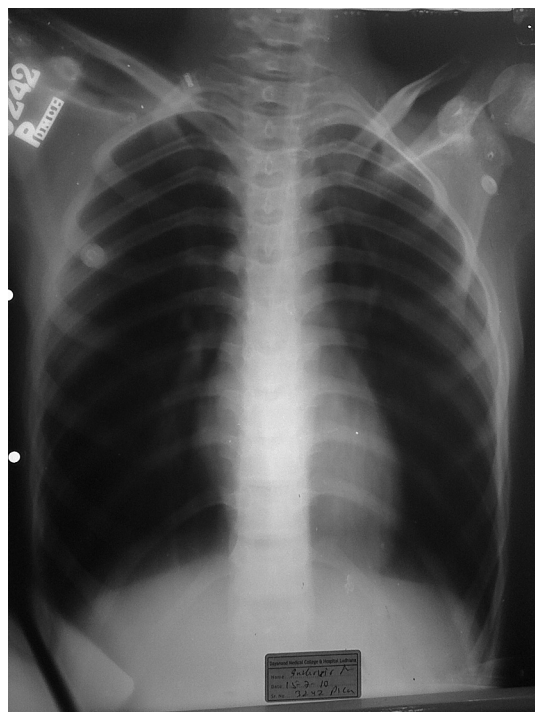


Fig. 1 – Chest X-ray at admission.

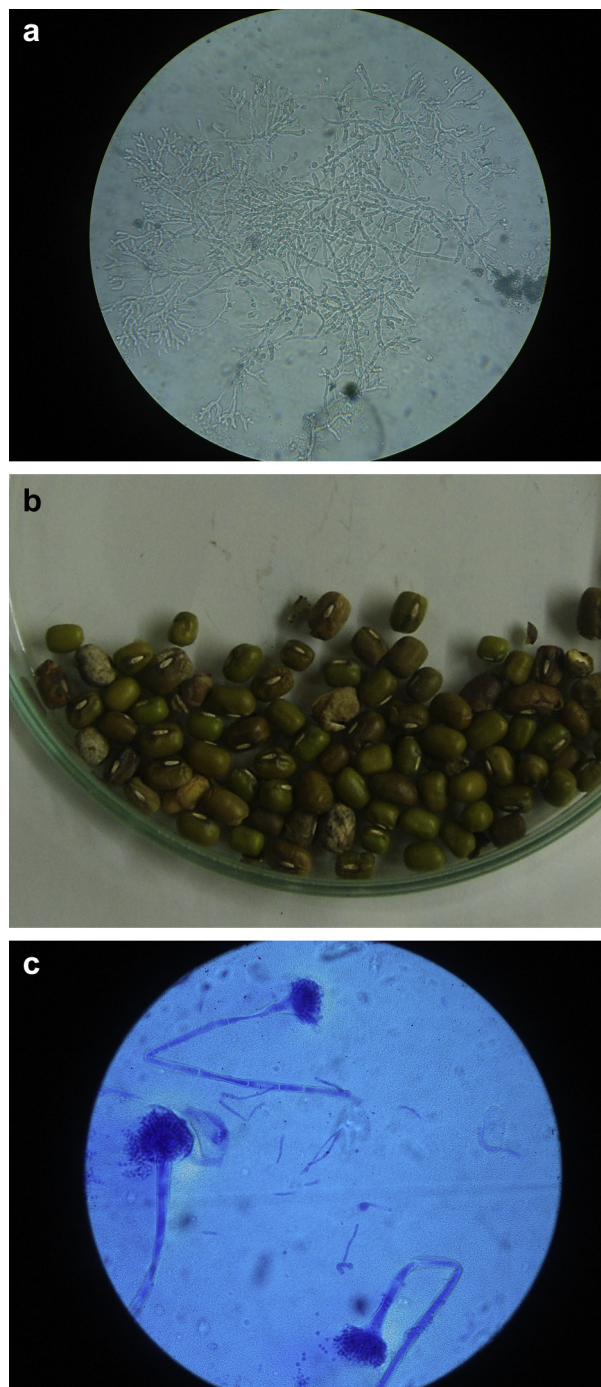


Fig. 2 – a) BAL sample, hyaline septate with dichotomous branching consistent with *Aspergillus flavus* (1). b) Shriveled, shrunk, discolored and deformed pulse grains. c) Growth of *Aspergillus flavus* from pulse grains.

On gross examination of seeds brought, some of these were shriveled, shrunk, discolored and deformed (Fig. 2b). On inoculation, within 48 h showed growth of *A. flavus* similar to BAL specimen (Fig. 2c).

He was discharged in stable condition. He is being followed up in chest clinic and is asymptomatic. Repeat chest X-ray showed normal lungs (Fig. 3). His IgE also showed fall to less than 100. He is going to school now with no symptoms.

In villages, farmers bring their crops to home and it is not unusual for their children to be exposed to these, but near fatal ABPA due to exposure to spoiled grains is not reported before.

3. Discussion

Aspergillus is a ubiquitous and filamentous fungus present in soil, decomposing vegetable material, on farming locations, in household dust, in building materials, ornamental plants, items of food, and water.² Inhalation of spores is not by itself sufficient to cause disease, and host characteristics or predisposing factors are usually present to account for a heightened susceptibility to disease. Atopic patients (those with allergic asthma, allergic rhinitis, and atopic dermatitis) commonly have IgE antibodies to molds as part of polysensitization.

Aspergillus infection can lead to multiple clinicopathologic syndromes.³ *A. fumigatus* is the commonest agent (90%) followed by *A. flavus* (10%) though latter is more frequent causative agent in North India.^{4,5} Bronchoscopy is not only useful in confirming diagnosis of ABPA but also helps to clear airways of mucus plugs, facilitating clinical and radiological improvement.⁶

ABPA occurs in 1–2% of patients with asthma and in 11% of patients with CF, although findings of ABPA occasionally occur in normal individuals. There is one case report each of life-threatening ABPA in a child with cystic fibrosis and asthma in a 20-year-old man respectively.⁷

ABPA is defined by a constellation of clinical, laboratory, and radiographic criteria, including active asthma, serum eosinophilia, elevated total IgE level (>417 IU/mL), fleeting pulmonary parenchymal opacities, bronchiectasis, and evidence for sensitization to *A. fumigatus* by skin testing. All of these criteria do not need to be present to diagnose ABPA.⁸

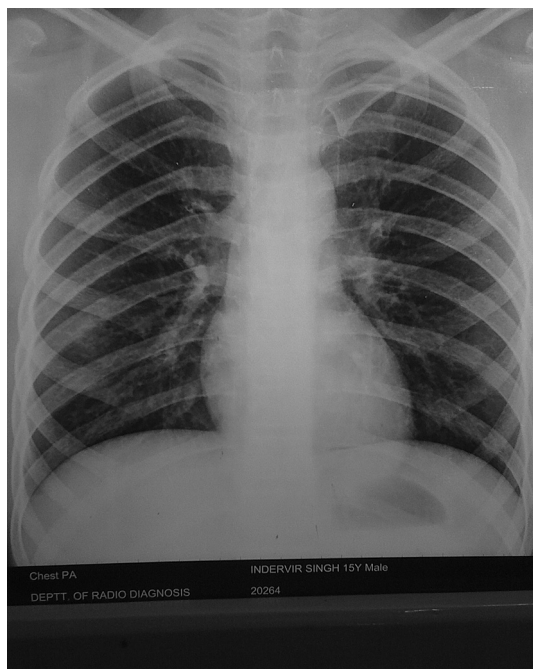


Fig. 3 – Chest X-ray at discharge.

In our patients IgE levels were high. The most common and definitive methods for the diagnosis of aspergillosis are direct microscopic examination and isolation of organism by culture. Use of oral antifungal therapy may result in large improvements in quality of life in about 60% of patients.⁹ Environmental control to lessen the exposure to the causative fungi is most important to prevent the spread of the disease.

4. Conclusion

ABPA can present with sudden life-threatening respiratory failure, with underlying normal lungs, in a patient with seasonal rhinitis. History of exposure is important.

Author contribution

PAP, DS were involved in clinical management of the case. PAP was involved in clinical research and writing the paper. DK, VK helped in writing the paper, got the literature and made the slides. All authors approved the final manuscript.

Conflicts of interest

All authors have none to declare.

Funding

None.

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