

## Case report: Allergic bronchopulmonary aspergillosis in asthma

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**A**llergic bronchopulmonary aspergillosis (ABPA) is an immunologic pulmonary inflammatory process seen in 1% to 6% of all asthma patients<sup>1</sup> and 10% of all corticosteroid-dependent asthma patients.<sup>2</sup> It is rarely seen in anyone who does not have asthma, with the exception of patients with cystic fibrosis.<sup>3</sup>

The underlying pathophysiology of ABPA includes colonization of a damaged respiratory tract with *Aspergillus fumigatus*. Clinical presentation of ABPA can range from mild bronchospasm to fibrotic parenchymal disease.<sup>1</sup> Allergic bronchopulmonary aspergillosis might progress to end-stage pulmonary fibrosis if it is not recognized early.<sup>4</sup> Diagnosis of ABPA might be easily missed or delayed because its clinical presentation is often indistinguishable from the more common pulmonary disorders seen in primary care.

### Case description

A 45-year-old man presented with a 2-day history of chest pain on his (posterior) right side that was aggravated by breathing deeply. He denied having a cough, fever, or shortness of breath, although several days before presentation he had chills and a cough that produced brownish plugs of sputum.

Systems review was unremarkable. Medical history revealed that the patient had had asthma since childhood. Medications taken included an inhaled bronchodilator and a corticosteroid. Physical examination of his chest was unremarkable. A radiograph of his chest revealed a large irregular area of consolidation primarily in the right upper lobe with some involvement

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of the middle lobe (**Figure 1**). Radiologic findings suggested a segmental infiltrate. There was no sign of pneumothorax or pleural effusion.

Antibiotics were initiated, and same-day referral to a respirologist was arranged. Serum IgE level was 6622 IU/mL (upper limit of normal being less than 100 IU/mL). Allergen-specific IgE for *A fumigatus* was very high at 4+. Serum eosinophil count was elevated at 1000 cells/mm<sup>3</sup>. Results of a skin test for *A fumigatus* were positive. In addition to antibiotics, the patient was also treated with high doses of oral prednisone, which completely cleared his symptoms and chest x-ray abnormalities, and returned his serologic parameters to normal.

### Discussion

A MEDLINE search dating back to 1960 was used to find articles related to diagnosis and management of ABPA. Key search words used included asthma, allergic bronchopulmonary aspergillosis, diagnosis, prevalence, and primary care. Major clinical features of ABPA include

- asthma,
- recurrent pulmonary infiltrates,
- immediate wheal and flare skin reaction to *A fumigatus*,
- elevated total serum IgE levels,
- detectable serum precipitating antibodies to *A fumigatus*,
- peripheral blood eosinophilia,
- elevated levels of *Aspergillus*-specific serum IgE and IgG when compared with levels from *Aspergillus*-sensitive asthma patients, and
- central bronchiectasis with normal distal structures.<sup>4,5</sup>

In this case, the history of productive cough and chest pain prompted chest radiography, which revealed a segmental infiltrate localized primarily to the right upper lobe. While segmental upper lobe involvement is commonly seen in ABPA,<sup>6</sup> other conditions, such as community-acquired pneumonia, bronchogenic carcinoma, tuberculosis,

and pulmonary embolus, might also be associated with segmental infiltrates. Initial management of patients with constitutional and respiratory system complaints and radiographic evidence of pulmonary infiltrates might include initiating antibiotics. Referral should be considered if there is concern that non-infectious causes are contributing to the problem. Allergic bronchopulmonary aspergillosis has been documented in both infants<sup>7</sup> and adults<sup>8</sup> with asthma.

Differentiating ABPA from more common pulmonary disorders remains a challenge due to similarities in symptoms. Several clues might help clinicians narrow the differential diagnosis in patients with respiratory complaints and pulmonary infiltrates: condition fails to improve after a course of antibiotics or a new infiltrate is found in a new location, which is not uncommon in ABPA. Patients with ABPA often complain of productive

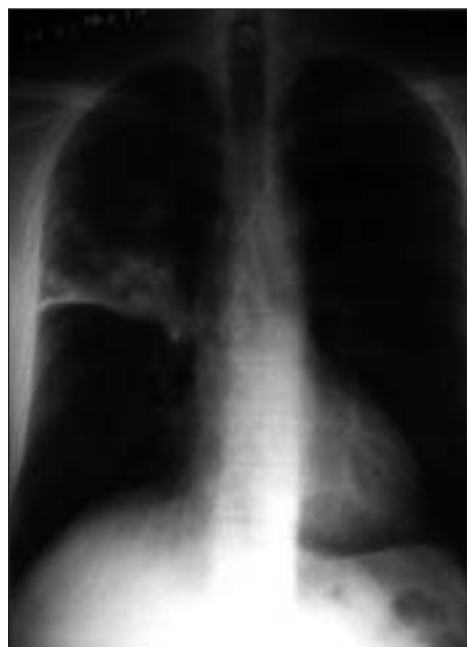
cough that is associated with golden brown sputum plugs. The clinical scenarios outlined above and a history of asthma might arouse suspicion about the possibility of ABPA.

In cases where specialist referrals cannot be arranged quickly (as might be the case in some rural settings), initiating oral corticosteroid therapy would be reasonable if antibiotics failed to provide resolution of disease evident on chest radiographs. Prednisone might be administered at a dose of 0.5 mg/kg daily for several weeks until patients are asymptomatic and pulmonary infiltrates resolve. The dose can then be converted to alternate days for up to 3 months.

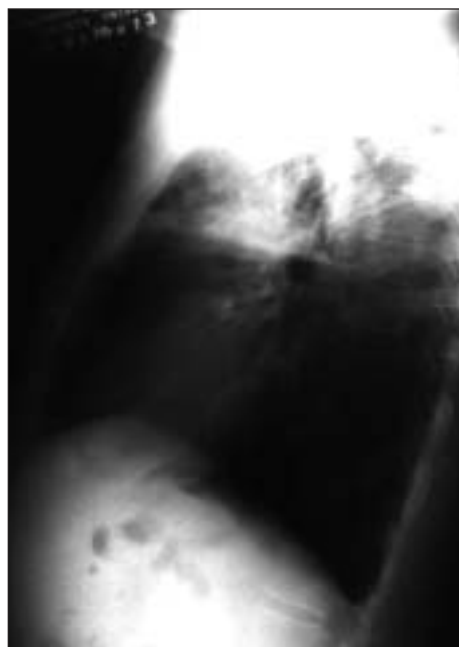
If pretreatment levels of serum IgE are known, one should aim to reduce them by more than 50% with corticosteroid therapy. The prednisone dose should be tapered slowly and might eventually be discontinued for some patients. Antifungal therapy

Figure 1. **Chest radiograph:** A) *Posteroanterior view shows a large irregular area of consolidation primarily in the right upper lobe and partially in the middle lobe.* B) *Lateral view.*

A



B



## CME

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#### Key points

- Allergic bronchopulmonary aspergillosis is a rare but treatable pulmonary inflammatory process. It is mostly seen in asthma patients, especially those receiving steroids, and cystic fibrosis patients.
- Consider the diagnosis in patients with a large pulmonary infiltrate that does not respond to antibiotics.
- Check serum IgE levels and an eosinophil count. Allergen-specific IgE for *Aspergillus fumigatus* is also available.
- Treatment is high-dose steroids.

#### Points de repère

- L'aspergillose broncho-pulmonaire allergique est une pneumopathie inflammatoire rare, mais qui peut être traitée. Elle se présente surtout chez des patients asthmatiques, en particulier ceux qui sont traités aux stéroïdes, et chez les patients souffrant de fibrose kystique.
- On peut envisager ce diagnostic chez les patients présentant une importante infiltration pulmonaire qui ne réagit pas aux antibiotiques.
- Il faut vérifier les taux des IgE sériques et des polynucléaires éosinophiles. Il existe également des épreuves des IgE spécifiques à l'*Aspergillus fumigatus*.
- La thérapie consiste en de fortes doses de stéroïdes.

2. Basich JE, Graves TS, Baz MN, Scanlon G, Hoffman RG, Patterson R, et al. Allergic bronchopulmonary aspergillosis in corticosteroid dependent asthmatics. *J Allergy Clin Immunol* 1981;68:98-102.
3. Glancy JJ, Elder JL, McAleer R. Allergic bronchopulmonary fungal disease without clinical asthma. *Thorax* 1981;36:345-9.
4. Greenberger PA, Patterson R. Diagnosis and management of allergic bronchopulmonary *Aspergillus*. *Ann Allergy* 1986;56:444-53.
5. McCarty DS, Simon G, Hargreave FF. The radiological appearance in ABPA. *Clin Radiol* 1970;21:366-75.
6. Mintzer R, Rogers L, Kriglik G. The spectrum of radiological findings in allergic bronchopulmonary aspergillosis. *Radiology* 1978;127:301-7.
7. Imbeau SA, Cohen M, Reed CE. Allergic bronchopulmonary *Aspergillus* in infants. *Am J Dis Child* 1977;131:1127-30.
8. Rickett AJ, Greenberger PA, Patterson R. Serum IgE as an important aid in management of allergic bronchopulmonary *Aspergillus*. *J Allergy Clin Immunol* 1984;74:68-71.

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has not been shown to be as effective as corticosteroids in managing ABPA. Inhaled corticosteroids do not consistently prevent recurrences of ABPA.

Allergic bronchopulmonary aspergillosis is an uncommon disorder with greater prevalence among asthma patients than among the general population. Early intervention might prevent progression to end-stage pulmonary fibrosis. ❀

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#### References

1. Greenberger PA, Patterson R. Allergic bronchopulmonary aspergillosis and the evaluation of the patient with asthma. *J Allergy Clin Immunol* 1988;81:646-50.