Allergic Bronchopulmonary Aspergillosis

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INSTRUCTIONS

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1. Review the target audience, learning objectives, and author disclosures.
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Date of Original Release: May 1, 2017. Credit may be obtained for these courses until April 30, 2018.

Overall Purpose/Goal: To provide excellent case-based reviews on key aspects of allergic disease to those who research, treat, or manage allergic disease.

Target Audience: Physicians and researchers within the field of allergic disease.

Accreditation/Provider Statements and Credit Designation: The American Academy of Allergy, Asthma & Immunology (AAAAI) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The AAAAI designates this journal-based CME activity for 1.0 *AMA PRA Category 1 Credit*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

List of Design Committee Members: Ashwini Reddy, MD, and Paul A. Greenberger, MD

Learning objectives:

1. To be able to identify and diagnose allergic bronchopulmonary aspergillosis (ABPA).
2. To be able to discuss currently utilized treatments for ABPA.
3. To be able to discuss novel treatment options for ABPA.

Recognition of Commercial Support: This CME has not received external commercial support.

Disclosure of Significant Relationships with Relevant Commercial Companies/Organizations: A. Reddy declares no relevant conflicts of interest. P. A. Greenberger is on the World Allergy Organization Board of Directors; has received consultancy fees from Allergy Therapeutics and the Food and Drug Administration, Pulmonary Allergy Drugs Advisory Committee; has provided expert testimony, none of which are related to this report; has received research support from Amgen, National Institute of Allergy and Infectious Disease, and Immune Tolerance Network; and receives royalties from Wolters Kluwer Lippincott, Williams & Wilkins, and UpToDate.

The Difficult Cases Feature is based on the *Difficult Cases* Course presented at the AAAAI Annual Meeting and coordinated by the AAAI New Allergist-Immunologist Assembly (NAIA). View the entire presentation and obtain CME or MOC credit by visiting the *JACI: In Practice* homepage www.jaci-inpractice.org.

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CASE REPORT

A 16-year-old boy with a history of cystic fibrosis (CF) and mild persistent asthma presented to outpatient care for 3 months of coughing. He had received 3 courses of ciprofloxacin and 2 courses of oral steroids and had felt slight improvement after each of those treatments. Of note, his cough was not associated with any chest tightness, wheezing, or shortness of breath, and albuterol did not relieve his symptoms. Chest x-ray showed mildly increased interstitial markings. Subsequent lab work revealed elevated values including a total IgE of 3390 IU/mL (range, 0-100 IU/mL), absolute eosinophils of 2910/μL (range, 40-380 μL), Aspergillus IgG 52.58 U/mL (range, 0-10 U/mL), and Aspergillus Abs by complement fixation of 1:16. He also had a prior positive skin prick testing to *Aspergillus* species. A diagnosis

of allergic bronchopulmonary aspergillosis (ABPA) was made, and he was started on itraconazole 200 mg BID and prednisone 60 mg daily for 7 days. Both medications were then weaned over several weeks. Two months later, he had returned to his normal activities (basketball, etc.), and his IgE was trending down to 2670 IU/mL.

DISCUSSION

ABPA can be seen in as high as 2.5% of the persistent asthma population and 2% to 15% of the CF population. Given its high prevalence in a common patient population seen in allergist offices, this diagnosis should be considered in patients with pulmonary eosinophilia/tenacious mucous plugging, infiltrates on chest x-ray, and positive skin/serologic testing.[1,2]

The precise minimal criteria of ABPA would be defined as follows: (1) asthma/CF, (2) positive skin test to *Aspergillus* sp., (3) IgE > 417 IU/mL (or kU/L), (4) increased specific IgE or IgG *Aspergillus* sp. antibodies, and (5) infiltrates on chest x-ray. Staging relies on a combination of clinical and radiologic findings and the total IgE concentration.[3] Those patients without demonstrated central bronchiectasis but who otherwise meet the above 5 criteria are described as serologic ABPA (ABPA-S).[4]

The initial treatment of both ABPA and ABPA-S is oral steroids. Antifungals are used as adjunctive therapy in steroid-dependent patients or in those with high degrees of fungal colonization. A reduction of total IgE concentration by 50% along with clearing of infiltrates represents progression towards remission.[5] Other therapies such as environmental/behavioral modifications, inhaled steroids, and macrolides are questionable but can be used in patients with related comorbidities such as allergic rhinitis and asthma. Omalizumab has been studied as a promising tool in patients with ABPA with a better safety profile regarding steroid use, improvement of exacerbations, and trending down of IgE. Lastly, anti-IL-5 monoclonal antibodies may be effective but more experience will be informative.[5,6]

In summary, our patient was at risk given his diagnoses of CF and asthma and prior positive skin test to Aspergillus. In addition, his elevated IgE, increased IgG Aspergillus antibodies, and abnormalities on chest x-ray led to the diagnosis of ABPA-S. ABPA and ABPA-S are common diagnoses and should be considered in our vulnerable patient populations. Vigilance in recognizing symptoms and appropriate diagnostic measures can lead to successful patient outcomes.

Further information can be obtained by viewing the original NAIA Difficult Cases presentation in this article's Online Repository at www.jaci-inpractice.org.

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