



MOC-CME Review

Treatment of moderate to severe pediatric asthma Omalizumab and potential future use of monoclonal antibodies

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INSTRUCTIONS

Credit can now be obtained, free for a limited time, by reading the review article in this issue and completing all activity components. Please note the instructions listed below:

- Review the target audience, learning objectives and all disclosures.
- Complete the pre-test.
- Read the article and reflect on all content as to how it may be applicable to your practice.
- Complete the post-test/evaluation and claim credit earned. At this time, physicians will have earned up to 1.0 *AMA PRA Category 1 Credit™*. Minimum passing score on the post-test is 70%.
- Approximately 4-6 weeks later you will receive an online outcomes assessment regarding your application of this article to your practice. Once you have completed this assessment, you will be eligible to receive MOC Part II credit from the American Board of Allergy and Immunology.

Overall Purpose

Participants will be able to demonstrate increased knowledge of the clinical treatment of allergy/asthma/immunology and how new information can be applied to their own practices.

Learning Objectives

At the conclusion of this activity, participants should be able to:

- Describe the indications for use of omalizumab in pediatric asthma
- Discuss the evidence that supports the use of omalizumab in pediatric asthma
- Review the literature on monoclonal antibodies that are under investigation in clinical trials for treatment of pediatric asthma

Release Date: July 1, 2016**Expiration Date:** June 30, 2017**Target Audience**

Physicians involved in providing patient care in the field of allergy/asthma/immunology

Accreditation

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Introduction

Asthma is among the most common chronic illnesses of childhood. Asthma prevalence is increasing. Asthma morbidity and mortality remain high among children from low-income and minority backgrounds.¹ Historically, pediatric asthma has been described as largely atopic, with a T_H2 cytokine profile that includes interleukin (IL) 4, IL-5, and IL-13; however, more recently, there has been emerging evidence of more phenotypic diversity, including T_H1 phenotypes related to obesity (also an inflammatory condition).^{2–4} Thus, it is important to tailor pediatric asthma treatment. Inhaled corticosteroids (ICSs) have been the mainstay of treatment in pediatric asthma. However, when ICSs and other standard treatments are ineffective in treating poorly controlled moderate to severe asthma, targeting the T_H2 profile with monoclonal antibodies may be effective in select atopic pediatric populations, and omalizumab, anti-IgE therapy, provides the first example. In this review article, we present a case of an atopic urban child with poorly controlled severe asthma. We review the evidence for the use of omalizumab in pediatric asthma. Omalizumab was the first biologic approved for use in pediatric asthma; however, more recently mepolizumab has been approved for use, and there are other monoclonal antibodies that are under investigation, including reslizumab, lebrikizumab, and tralokinumab (which we will review briefly).

Clinical Vignette

Case Presentation

A 12-year-old African American boy with asthma is referred by his primary care physician to the allergy clinic for treatment of his poorly controlled severe asthma. At the age of 2 years, he was diagnosed as having reactive airway disease and subsequently asthma after an episode of bronchiolitis. He has a history of infant

eczema, allergic rhinitis, and asthma. His asthma has been poorly controlled with high-dose ICSs, long-acting β -agonists (LABAs), and montelukast for the past few years. In the past month, he has used his albuterol rescue inhaler daily for shortness of breath, and he has decreased physical activity. He has nighttime awakenings because cough more than twice a week. He has no known food or drug allergies.

Asthma and environmental history

He takes his asthma medications daily as prescribed, and his parents report strict adherence. He requires 2 to 3 bursts of oral glucocorticoids per year (mainly during the fall and winter). He has 2 to 3 emergency department visits a year for asthma. He had 1 hospitalization in the distant past for bronchiolitis at the age of 2 years. He has no history of prior intubations. His asthma triggers include upper respiratory tract infections, cold air exposure, and exercise. There is no environmental tobacco smoke exposure. He lives in an urban environment. There are no pets in the home, but there is rodent and cockroach infestation.

Family history

He has a strong family history of atopy. His mother has asthma and eczema. His father has asthma and hay fever. He has a 5-year-old sister with asthma, eczema, and food allergies.

Physical examination findings

He is a 12-year-old boy with normal vital signs and pulse oximetry. His body mass index (calculated as the weight in kilograms divided by height in meters squared) is in the 75th percentile. He does not appear to be in any respiratory distress. He has no use for accessory muscles for breathing. He has pale edematous bilateral nasal turbinates. There is normal chest excursion, and his lungs are

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