THE CHILDREN'S MEDICAL CENTER OF DAYTON

Pediatric Clips

Assessing the child with prolonged cough — Robert J. Fink, MD

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Pediatric Clips from The Children's Medical Center are quick reviews of common pediatric conditions.

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Dayton, Ohio

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CASE: A FIVE-YEAR-OLD PRESENTED WITH A HISTORY OF ACUTE VIRAL UPPER RESPIRATORY INFECTIONS

Katie is a 5-year-old female with a history of acute viral upper respiratory infections usually treated with cough suppressants. She presents with a dry cough which lasts four weeks and worsens during the night.

RESPONSE

Although cough is an extremely common pediatric complaint, a chronic cough or cough lasting beyond three weeks is generally abnormal and requires an evaluation to properly identify and treat the underlying condition.

Cough occurs in nearly all infants, most children, and is less frequent in adolescents. The most common trigger of cough is irritation or inflammation of the airways. Acute viral upper respiratory infections are responsible for most episodes of cough in all age groups. The cough is usually minimally productive and is self-limited typically lasting between one and three weeks. Little therapeutic intervention is required of the physician beyond explanation and reassurance.

A cough is a reflex that helps clear the airways and allow normal breathing. It consists of a deep inspiration, glottic closure, forced expiration, sudden glottic opening, and explosive release of air. Cough clears the airways of obstruction/secretions by several mechanisms.

The differential diagnosis of chronic or prolonged cough is best approached by examining likely causes in different age groups. A thorough respiratory tract history, including the upper respiratory tract and sinuses, should be obtained with emphasis on age of onset; nature and timing of the cough (especially nocturnal cough); triggering factors; sputum production; environmental, allergic, and seasonal factors; and response to previous therapy (especially bronchodilators). A complete physical exam with emphasis on the upper and lower respiratory tract will help develop a focus on the most likely causes. A useful differential diagnosis by age for chronic or prolonged cough follows:

INFANCY

- aspiration / swallowing dysfunction
- asthma
- gastroesophogeal reflux
- congenital malformations
- environmental tobacco smoke exposure (secondhand smoke)
- cystic fibrosis (CF)
- infection (chlamydia, mycoplasma, pertussis)
- immunodeficiency

CHILDHOOD

- asthma
- cystic fibrosis
- foreign body aspiration
- infection (mycoplasma, adenovirus, influenza)
- immunodeficiency
- immotile cilia syndrome (ICS)
- sinus disease
- smoking
- habitual cough (psychogenic)

ADOLESCENCE

- asthma
- cystic fibrosis
- smoking

Depending on the findings of history and physical exam, a laboratory evaluation should be performed. A recent PA and lateral chest x-ray (CXR) should be carefully reviewed for airway abnormalities, hilar structures and parenchymal alterations. Hyperinflation and peribronchial cuffing are usually present in asthma, but are also associated with many other disorders. Mild bronchiectasis is very hard to discern on CXR and a thin section CT should be obtained if this diagnosis is suspected. An effort should also be made to obtain any previous CXR for review. Other imaging studies that may be indicated include barium swallow (GER and anatomic lesions), modified barium swallow (aspiration, swallowing disorders) and sinus films (CT of sinuses best; pansinusitis common in CF, ICS, immunodeficiency).

A sweat test remains the "gold standard" for the diagnosis of CF. A sweat test is indicated for most cases of chronic cough as recent

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studies have shown "mild" cases of CF may masquerade as asthma for many years. ACOG (American College of Obstetrics and Gynecology), ACMG (American College of Medical Genetics and NIH (National Institutes of Health) have recently recommended widespread prenatal carrier testing for CF and several states have newborn screening programs for CF.

Quantitative immunoglobulins are indicated for cough associated with recurrent OM and sinusitis, sputum production and all cases of bronchiectasis. Isolated immunoglobulin A deficiency occurs with a frequency of 1:1,000 but commonly is not diagnosed.

Ciliary biopsy and electron microscopy should be reserved for cough associated with severe recurrent/chronic OM, sinusitis, and bronchiectasis where other diagnoses have been ruled out.

Undiagnosed or undertreated asthma is the most common cause of a chronic cough. The asthmatic cough is usually dry and frequent. The cough usually worsens at night and with upper respiratory infections. Coughing may also be triggered by exercise, weather change, allergen exposure or cigarette smoke.

Pulmonary function testing should be performed in all children over age five years to evaluate for the presence of asthma/reactive airway disease. It is important to remember that asthma may coexist with other disorders such as CF, immunodeficiency, ICS. Pulmonary function testing before and after bronchodilator inhalation is necessary to document reversible airway obstruction, the hallmark of asthma. An exercise induced bronchospasm study will detect asthma in more individuals than a non-exercise study. The "gold standard" for the diagnosis of asthma is the methacholine challenge study which is indicated only if bronchodilator studies are non-diagnostic. All of these studies are available in the pulmonary diagnostic lab at The Children's Medical Center.

The evaluation of the pediatric patient with a prolonged/chronic cough is often complex. The basic evaluation outlined in this article will identify a diagnosis in most cases. Therapy should always be directed at the underlying disorder and the long-term use of cough suppressants should be discouraged.

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Featured specialist

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