Chronic Cough

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Disclosure

- None
Objectives

1. Review of the cough reflex and the mechanism of cough

2. Approach to common & uncommon causes of chronic cough
Introduction

- Cough is an important defensive reflex.
Chronic Cough-Definition

- There is no consensus as to the length of time in the definition of chronic cough in children.

- Chronic cough is generally defined as a daily cough lasting between 4 – 8 weeks.

Cough Reflex

Each cough occurs through the stimulation of a complex reflex arc that has 3 components:

- Afferent sensory limb
- Central processing center
- Efferent limb.
COUGH!
COUGH!
Mechanism of Cough
Chronic Cough—Common Causes

- Upper airway cough syndrome (UACS)/postnasal drip syndrome (PNDS)
- Asthma
- Gastroesophageal reflux disease (GERD)

Pratter MR. *Chest*. Jan 2006
Chronic Cough – Less common causes of Cough

- Aspiration syndrome
- Congenital abnormality – tracheobronchomalacia
- Foreign body aspiration
- Post pertussis
- Habit cough
- Chronic suppurative lung disease and bronchiectasis
- Cystic Fibrosis
- Protracted bacterial bronchitis
- Ciliary Dyskinesia
Approach to Chronic Cough

- Evaluate each case of cough individually
- Determine management according to the cause of the cough since it is not a “one size fits all” proposition
- Possibility of more than one cause contributing to chronic cough
- Simply suppressing the cough is not the answer
Case Presentation

Chronic cough
Case Presentation

- A 6 yr old M came to the pediatric pulmonary clinic
- Symptoms started at 18 months of age with URI with associated increased work of breathing and cough
- Started on albuterol 1 yr. ago which he continued to require frequently
- Multiple URIs over the course of several months to years with associated wheezing and dyspnea - worse in fall and winter
- Symptoms improved with inhaled steroids but did not resolve
Pediatric Pulmonologist!

When you’re a hammer everything looks like a nail
Asthma

- Chronic inflammatory disorder of the airways characterized by mucosal edema and variable airflow obstruction due to airway hyperresponsiveness to variety of triggers

Asthma-History

Cough

Wheezing, dyspnea, chest tightness, shortness of breath

Triggers

Response to intervention

Family history

Social history
Upper airway cough syndrome

- Allergic rhinitis
- Acute sinusitis
Case presentation – contd.

- 6 yr old M with chronic cough
- Cough symptoms improved but did not completely resolve
- Reports of itchy eyes, itchy nose, sneezing and rash whenever he played in the park
- RAST test- positive for cat & dog dander, peanuts, alternaria, aspergillus, cockroach, and various other indoor and outdoor allergens.
Allergic rhinitis

- Rhinorrhea
- Nasal congestion
- Postnasal drainage
- Repetitive sneezing
- Itching of the palate, nose, ears, or eyes
- Constant clearing of the throat
- Headaches
Allergic rhinitis - Physical exam

- Allergic shiners
- Morgan-Dennie lines
- Allergic salute
Acute Sinusitis/Rhinosinusitis

Inflammation of the lining of the paranasal sinuses and nasal mucosa

- Persistent nasal discharge
- Daytime cough without improvement for 10 days or more
- Worsening course with fever & purulent discharge

Wald, Pediatrics; 2013
Acute Sinusitis/Rhinosinusitis

Oral maxillofacial surgery 2011
Acute Sinusitis/Rhinosinusitis

- No imaging needed
- Antibiotic therapy is recommended for treatment of acute bacterial sinusitis
- Amoxicillin with clavulanic acid
Gastroesophageal reflux disease

- Distal esophageal acid exposure
- Laryngopharyngeal reflux (LPR)

O’Hara J, Jones NS. *J Laryngol Otol.* Jul 2005
Gastroesophageal reflux disease
Gastroesophageal reflux disease

Management

▪ Histamine (H2) blockers
▪ Proton pump inhibitors (PPIs).

Gastroesophageal reflux disease

- Dual-channel 24-hour impedance pH probe monitoring correlated with coughing episodes
- Flexible nasopharyngoscopy
- Bronchoscopy with bronchoalveolar lavage
  - Lipid laden macrophages.
Aspiration syndrome

- Any conditions in which oral or gastric contents are inhaled into the lungs.
- Swallowing dysfunction
- Video fluoroscopic swallow study (VFSS) and/or fiberoptic endoscopic evaluation of swallowing (FEES)
- Dietary modifications include thickening feeds for infants; decreasing volume of feeds and feeding small, frequent meals
Tracheomalacia

- Flaccidity of the supporting tracheal cartilage
- Widening of the posterior membranous wall
- Reduced anterior-posterior airway caliber

http://www.chop.edu/bronchoscopy.html

Case Presentation

Cough with hemoptysis
Case presentation

- 9 year old M who presented to pediatric pulmonary clinic with cough and hemoptysis.

- Started with symptoms 9 days prior to presentation to our clinic.

- Initial ER evaluation with CXR suggested right lower lobe infiltrate.

- Offered a course of antibiotics with minimal improvement

- Persisted with hemoptysis over the next several days

- Physical examination was normal in pulmonary clinic
Case presentation
Case presentation - Foreign Body
Foreign Body

- A cough of sudden onset while playing or eating

- Rigid bronchoscopy is the best way to manage aspiration of foreign body
Post pertussis cough

- In infants and young children—typical whooping cough.
- In older children, the classic features may not be seen, and the cough may persist for weeks after the infection has cleared.
- Should be considered in children with chronic cough regardless of immunization status
- Diagnosis & treatment is a challenge
Psychogenic/Habit cough

- The cough is often quite distinctive
- Present during the day
- Absent at night and rarely interrupts play, speech, or eating.
- Patients complain of tickling in the throat, and the pattern of the cough supports a laryngeal origin

Chronic ‘wet’ cough

A chronic productive (or "wet-moist") cough suggests a suppurative process and may require further investigation to exclude

- Cystic fibrosis
- Bronchiectasis
- Primary ciliary dyskinesia
- Immune deficiency or autoimmune disease
- Bacterial bronchitis
Cystic Fibrosis

- Cystic fibrosis is most common lethal inherited disease in Caucasians
- Complex and multisystem involvement
- Newborn screening for cystic fibrosis is universally offered
- Diagnosed with positive sweat chloride test results
Bronchiectasis

- Abnormal and permanent dilation & distortion of one or more conducting airways
- Infectious process.
- CT scan is the standard test for diagnosis
Protracted Bacterial Bronchitis

- A persistent 'wet' cough.
- A protracted or persistent infection of the conducting airways
- The definitive investigation, although invasive, is fiberoptic bronchoscopy with BAL
- Resolves with three weeks of high dose antibiotics such as Amoxicillin with clavulanic acid
Work up

Chronic cough
Chest Radiography

It should be considered for the evaluation of a child with chronic cough.
Pulmonary Function Test

- Spirometry will demonstrate obstructive pattern in diseases such as asthma.

Standardization of spirometry, Eur Respir J 2005
Bronchoscopy

- Extraction of foreign body by ENT for suspected aspiration.
- Evaluation for airway malacia, tracheoesophageal fistula, or stenosis.
- Infectious etiologies
Discourage OTC medication for cough suppression

- There is limited evidence to support the few therapeutic agents currently available to treat cough.

I. Paul, Lung, 2012
Conclusion

▪ Thorough evaluation of chronic cough is key to effective management

▪ Clinicians should try to elucidate and identify the underlying cause of the cough through history and physical which may be confirmed with work up.

▪ Chronic cough is often due to a combination of etiologies.
Thank you!
References


References

Asthma

Pediatric Asthma in a Nutshell
Holger Werner Link
*Pediatrics in Review* 2014;35:287
DOI: 10.1542/pir.35-7-287

Allergic rhinitis

The diagnosis and management of rhinitis: An updated practice parameter

Chief Editors: Dana V. Wallace, MD, and Mark S. Dykewicz, MD
Co-Editors: David I. Bernstein, MD, Joann Blessing-Moore, MD, Linda Cox, MD, David A. Khan, MD, David M. Lang, MD, Richard A. Nicklas, MD, John Oppenheimer, MD, Jay M. Portnoy, MD, Christopher C. Randolph, MD, Diane Schuller, MD, Sheldon L. Spector, MD, and Stephen A. Tilles, MD
J Allergy Clin Immunol 2008;122:S1-84. 0091-6749/$34.00
Acute Sinusitis/Rhinosinusitis

Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years
Ellen R. Wald, Kimberly E. Applegate, Clay Bordley, David H. Darrow, Mary P. Glode, S. Michael Marcy, Carrie E. Nelson, Richard M. Rosenfeld, Nader Shaikh, Michael J. Smith, Paul V. Williams and Stuart T. Weinberg
Pediatrics; originally published online June 24, 2013;
DOI: 10.1542/peds.2013-1071

Acute Bacterial Sinusitis in Children
Gregory DeMuri and Ellen R. Wald
Pediatrics in Review 2013;34:429
DOI: 10.1542/pir.34-10-429
Gastroesophageal reflux disease

Pediatric Gastroesophageal Reflux Clinical Practice Guidelines: Joint Recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESP GHAN)

Co-Chairs: *Yvan Vandenplas and †Colin D. Rudolph
Committee Members: ‡Carlo Di Lorenzo, §Eric Hassall, ||Gregory Liptak,
††Lynnette Mazur, #Judith Sondheimer, **Annamaria Staiano, †††Michael Thomson,
‡‡Gigi Veereman-Wauters, and §§Tobias G. Wenzl

*Journal of Pediatric Gastroenterology and Nutrition
49:498–547 © 2009 by European Society for Pediatric Gastroenterology, Hepatology, and Nutrition and North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

Chronic Cough

Chronic Cough in Children: A Primary Care and Subspecialty Collaborative Approach
Robert Kaslovsy and Matthew Sadof
Pediatrics in Review 2013;34:498
DOI: 10.1542/pir.34-11-498
Habit cough

Habit Cough, Tic Cough, and Psychogenic Cough in Adult and Pediatric Populations

ACCP Evidence-Based Clinical Practice Guidelines

Richard S. Irwin, MD, FCCP; William B. Clomb, MD, FCCP; and Anne B. Chang, MBBS, PhD

CHEST 2006:
Protracted Bacterial Bronchitis
“You’ll be coughing up big bucks for quite some time, Mr. Vaniborn. Don’t be alarmed—it’s perfectly normal.”