Evaluation and Treatment of Chronic Cough: A Practical Review

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Disclosures

None....
But a confession is in order....!
These Numbers Make Me Very Sad...

30 million

38%

46%
Objectives

• Understand the common causes of chronic cough
• Develop an algorithm for evaluation of patients with chronic cough
• Appreciate the therapeutic alternatives when etiology of cough cannot be identified
• Recognize the areas for which further research is needed
What is it....

<table>
<thead>
<tr>
<th>Acute</th>
<th>Subacute</th>
<th>Chronic</th>
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<tbody>
<tr>
<td>Infection</td>
<td>Post infectious</td>
<td>The big three</td>
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<tr>
<td>COPD</td>
<td>Bordatella</td>
<td>GERD</td>
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<tr>
<td>? PE</td>
<td></td>
<td>Asthma</td>
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<tr>
<td>CHF</td>
<td></td>
<td>Upper airway cough syndrome</td>
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</tbody>
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Initial Overview

Is cough an isolated symptom?
- Associated exertional dyspnea
  - Dry cough is often presenting complaint in ILD, overshadowing exertional dyspnea
  - Look for DLCO reduction in isolation or with early restriction
- Systemic symptoms and/or hemoptysis
  - Malignancy
  - Bronchiectasis
  - Connective tissue disease
Medication Review: ACE-I

10-15%

Characteristics:
◦ Usually within a week, but can be delayed
◦ “Itchy” sensation in throat
◦ Does not appear to be related to underlying asthma
◦ Resolution with discontinuation is usually in days but can be weeks
◦ Re-challenge is not advised

Frequency of cough with ARBs similar to placebo
Medication Review: Others

Various mechanisms
- Both direct and indirect
  - Bronchospasm
  - Beta blockers
- ILD
  - Chemotherapy, sirolimus, rituximab
  - Cryptogenic organizing pneumonia
  - Amiodarone

Unintentional consequences
- Inhaled agents empirically prescribed for cough can worsen it

www.pneumotox.com
Discontinue smoking, ACE-I

Imaging

NORMAL

- COPD
- OTHER

- ENVIRONMENTAL EXPOSURE
- EOSINOPHILIC BRONCHITIS
- UPPER AIRWAY SYNDROME
- ASTHMA
- GERD
Upper Airway Cough Syndrome (UACS)

Underlying pathology is variable
- Allergic rhinitis
- Non-allergic rhinitis
- Vasomotor rhinitis

Diagnostic clinical and radiographic criteria lacking
- Sinus mucosal thickening not specific

Response to therapeutic trial probably most helpful
UACS: Therapy

Antihistamines
- First generation agents may be more helpful
- Diphenhydramine – more sedating
- Chlorphenamine and brompheniramine greater change of paradoxical CNS stimulation

+/- decongestant
- Caution with hypertension

Nasal steroids

Nasal anticholinergics
- Vasomotor rhinitis
- Caution with glaucoma, BPH, bladder outlet obstruction
The Trouble Maker

Cell surface membrane
Cytoplasm (most of cell contents)
Secretion granule, with toxins
Nucleus of cell
Non-asthmatic Eosinophilic Bronchitis

Eosinophilia, atopy, nonproductive cough
Sputum eosinophils (>3%)
Shares features of asthma except:
  ◦ Dyspnea not usually present
  ◦ No bronchial hyperresponsiveness
  ◦ No mast cells on biopsy
Cough usually non-productive
Biopsy is definitive but response to therapy (inhaled corticosteroids) more pragmatic approach
GERD & Laryngopharyngeal Reflux

Mechanism

- GERD (Lower esophageal dysfunction)
  - Stimulation of laryngeal cough receptors
  - (Micro)aspiration
  - Esophageal-tracheobronchial cough reflex
- LPR (Upper esophageal dysfunction)
  - Gastric acid and pepsin irritating laryngopharynx

Diagnosis

- Barium swallow
- 24 hr pH & impedance study
- Laryngoscopy
GERD & LPR Therapy

Acid suppressing therapy
  ◦ Non-acid reflux may still occur

Surgery

Nonpharmacological measures should be included
  ◦ Weight loss
  ◦ Head of bed elevation
  ◦ Avoidance
  ◦ Timing of meals
LESS COMMON CAUSES
“I can’t shake your hand Doctor because I am holding my hanky!”

BRONCHIECTASIS WITH OR WITHOUT NONTUBERCULOUS MYCOBACTERIUM

RML bronchiectasis with airway wall thickening

Solitary pulmonary nodule

“Tree-in-bud” opacities in lingula
The Value of Inspiratory and Expiratory Imaging
TRACHEOBRONCHOMALACIA
Foreign body or endobronchial disease

Benign tumors
Cancers
Carcinoid
Metastasis
Impacted ear wax
Sleep apnea
Chronic tonsillar enlargement
Everything’s Negative...Now what?

Unexplained chronic cough
- Persists > 8 weeks
- Remains unexplained after investigations and/or
- Refractory to supervised therapeutic trial(s)

Expert Panel Recommendations
Everything’s Negative...The Value of Speech Therapy

Education

Strategies to reduce cough
- Modified swallowing technique
- Pursed lip breathing
- Relaxed throat breathing
  - Inhale through nose with mouth closed
  - Pursed lip exhalation making “s” or “sh” sound

Reduce laryngeal irritation
- Hydration
- Avoidance of stimuli
Cough Hypersensitivity Syndrome or Laryngeal Sensory Neuropathy

“Troublesome coughing often triggered by low level of thermal, mechanical or chemical exposures”

- Eur Resp Society Taskforce

Laryngeal hypersensitivity

Enhanced neural sensitization

- Consequent of prior sensory nerve damage?
- Co-localization with inflammatory cells or mediators
Sensory Evoked Laryngeal Sensory Action Potential (SELSAP)
Centrally acting neuromodulators

Gabapentin

- Dose escalation
- Start 300 mg daily
- Maximum of 1,800 mg daily in BID dosing

Side effects

- Mood disorders
- Lethargy, drowsiness
- Blurred vision

Dose adjust with renal impairment

Not FDA approved indication

Re-assess at 6 months
Centrally acting neuromodulators

- Amitriptyline
- Nortriptyline
- Pregabalin
  - Active clinical trial
- Investigational TRP channel targeted therapy
  - Transient receptor potential nocioreceptors
Anti-tussive Therapy

• Benzoate
  • Swallow capsule whole
  • Avoid in children

• Nebulized lidocaine
  • 3-5 4% preservative free lidocaine
  • Minimize talking
  • NPO 1-2 hrs before and after

• Narcotics
Everything’s Negative...Is It all in Your Head

• Don’t assume chronic unexplained cough is psychogenic in those with anxiety and/or depression

• Absence of nocturnal symptoms does not exclude psychogenic cough

• Tic coughs should have other features of tics (suppressibility, distractibility) and often coexist with other tics
  • Hypnosis, counseling
Improved understanding of individual sensitivity to cough stimuli

Targeted therapies

Predictors of response to “likely causes”

$\textit{unexpected}$$\textit{results}$
Mayo Multidisciplinary Cough Clinic

Allergy, pulmonary
  ◦ Support with ENT and GI

Pre-appointment questionnaire and review of records

Pre-scheduling of appointments after review by a trained RT

Aim for 1-2 day visit

Database for objective prospective analysis
Take Home Points

• Subacute cough is often post-infectious and can last many weeks after other symptoms have resolved.

• A thorough medication review can make your life easier.

• Evaluation for chronic cough should (usually) include lung function, imaging, bronchial hyperresponsiveness testing, and evaluation for GERD.
Take Home Points

• First do no harm
  • Steroids and PPI not routinely indicated
• Your local speech therapist can be your friend!
• Trial of gabapentin may be appropriate
• Referral to a chronic cough center is often warranted