Treatment of Cough

Dr Munir Gharaibeh, MD, PhD, MHPE
Department of Pharmacology
School of Medicine
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Cough

Cough is a symptom of an underlying illness.

Cough is a useful protective reflex elicited by:

Mechanical stimulation of large respiratory passages, by foreign bodies or inflammatory exudates or debris.

Chemical stimulation of alveoli.

After receptor activation, impulses are carried through afferent vagal nerves to a medullary center to initiate deep inspirations, followed by strong expiratory effort against closed glottis leading to increased pressure in the airways. Glottis suddenly relaxes, mouth opened, and air is released at high pressure.

Cough

Cough is one of the most common reasons patients see physicians, it might indicate:

Something is wrong.

Exhaustion.

Insomnia.

Musculoskeletal pain.

Hoarseness of voice.

Urinary incontinence.

Dizziness, headache, syncope.

Nausea, vomiting, retching, and anorexia.

Fear of cancer, AIDS, or TB.

Specific Treatment of Cough

Directed on the etiology or pathophysiological mechanism:

Bronchial Asthma.

Postnasal drip due to sinusitis.

Postnasal drip due to allergic or perennial non allergic sinusitis.

Chronic bronchitis.

Gastroesophageal Reflux(GERD).

Sarcoidosis.

Congestive heart failure.

ACEI-induced cough.

Nonspecific Treatment of Cough

Directed at the symptom.

Indicated when definitive therapy cannot be given either because:

a. the cause is unknown

b. definitive therapy did not have the chance to work or will not work(e.g. cancer metastatic to lung).

Treatment of Cough

Drug treatment is divided into two main categories:

a. **Antitussive Drugs:** therapy that controls, inhibits or eliminates cough. Useful to suppress intensity and frequency of coughing when it is unproductive and distressing.

b. **Protussive Drugs:** therapy that makes cough more effective, when it is productive, to expel a foreign body or exudates.

Drugs for Cough

- Drugs that may alter mucociliary factors.
- Drugs acting on the afferent limb.
- Drugs acting on the cough center.
- Drugs acting on the efferent limb.
- Drugs acting on the respiratory skeletal muscles.

Drugs for Cough

- **Drugs that may alter mucociliary factors:**
  - Increase the volume of the secretions.
  - Change the consistency of mucus (i.e. Mucolytics).
  - Increase mucociliary clearance.

Drugs for Cough

- **Drugs that may alter mucociliary factors:**
- **Ipecacuanha(عرق الذهب) and Squill(بصل الفار): are natural products which have direct effects on CNS and locally to cause emesis which is preceded by increased secretions.**

- **Volatile oils (e.g., lemon, anise, pine), have direct action on bronchi.**

- **Iodinated glycerol: is excreted through bronchial glands and stimulates secretions directly. Widely used but have doubtful efficacy. Can cause congenital hypothyroidism, so contraindicated in pregnancy and during lactation.**

- **Drugs that may alter mucociliary factors:**
  - **Bromhexine: increases lysosome activity leading to increased enzyme secretion and hydrolysis of mucopolysacharides.**
  - **Carbocisteine: an aerosol, works through its SH group to reduce disulfide bonds in mucoproteins leading to enhancement of flow. May irritate the airways in some sensitive patients.**
  - **Combination of H1-histamine antagonist and a decongestant.**
  - **Ammonium chloride.**
  - **Hydration: either orally or intravenously.**

- **Drugs that may alter mucociliary factors:**
  - **Ipratropium bromide.**
  - **Beta adrenergic agonists.**
  - **Theophylline.**
  - **Sodium chromoglycate.**
  - **Beclomethasone.**

These drugs are discussed in the treatment of bronchial asthma.

- **Drugs that may alter mucociliary factors.**
- **Drugs acting on the afferent limb:**
  - **<u>Local anesthetics:</u>**
    - **Lidocaine, applied topically, has transient antitussive effect. Intravenously, could have a central effect.**
  - **<u>Opioids:</u>**
    - **This is besides their primary central effect.**

- **Drugs that may alter mucociliary factors.**
- **Drugs acting on the afferent limb.**
- **Drugs acting on the cough center:**
  - **Narcotics:**
    - **Codiene: Is the standard, recently found no more effective than syrup vehicle. May have demulcent (ملطف) activity.**
    - **Diamorphine.**
    - **Morphine.**
  - **Non narcotic:**
    - **Dextromethorphan.**
    - **Glaucine.**
    - **Diphenhydramine.**
    - **Pholcodine**

- **Drugs that may alter mucociliary factors.**
- **Drugs acting on the afferent limb.**
- **Drugs acting on the cough center.**
- **Drugs acting on the efferent limb:**
  - **Ipratropium Bromide**
    - **Given as an aerosol.**
    - **Effective for asthma, chronic bronchitis, and persistent cough following URTI.**
    - **Can also have effects on cough receptors by altering mucociliary factors**

- Drugs that may alter mucociliary factors.
- Drugs acting on the afferent limb.
- Drugs acting on the cough center.
- Drugs acting on the efferent limb.
- Drugs acting on the respiratory skeletal muscles:
  - Nondepolarizing blockers like pancuronium.
  - May be considered in patients who can not be mechanically ventilated because of uncontrollable spasms of coughing.

Protussive Therapy

- This treatment increases cough effectiveness with or without increasing cough frequency.
- They either increase superficial velocity or alter mucus factors.
- Indicated when cough performs a useful function, and needs to be encouraged(e.g. bronchiectasis, cystic fibrosis, pneumonia and postoperative atelectasis).

Protussive Therapy

- **Hypertonic(3%) Saline Aerosol:**
  - Improves cough clearance but not pulmonary function or subjective assessment.
- **Amiloride Aerosol:**
  - For cystic fibrosis.
- **Bronchodilators:**
  - However, with too much relaxation, flow rates may actually decrease.

Protussive Therapy

- **Mechanical Measures:**
  - Positive insufflation followed by manual compression of the lower thorax and abdomen.
  - Abdominal push manoevure to assist expiration.
  - Combining abdominal binding and muscle training of the clavicular portion of pectoralis major.
  - Combination of positive expiratory pressure and chest physiotherapy in patients with chronic bronchitis.