Expert Opinion on the Management of Acute and Chronic Cough: An Indian Perspective in Primary Care Setting

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Abstract

Cough is the body’s reflex when the throat or airway is irritated by a foreign body, such as irritants, microbes, and fluids. Cough caused due to a disorder or infection can last for a few days to a couple of weeks and is usually self-limiting and self-resolving. However, in certain cases, cough can persist for months, disrupting everyday activities, affecting the patient’s mental health, and causing pain and fatigue. There are a number of different therapeutic strategies to manage acute and chronic cough, depending on the cause. Dry cough can be treated using opioids, nonopioids, antitussives, and antihistamines. Expectorants and mucolytics are widely used in the management of productive cough. The underlying cause of cough should be appropriately managed with specific therapy. The choice of treatment regimen is dependent on the patient’s medical history, symptoms, and preexisting conditions. Based on the literature review and clinical practice, a comprehensive approach to the management of cough as a symptom has been proposed.

Introduction

Cough is a protective reflex, which is sudden, repetitive, and often self-limiting in nature.1 Normally, cough acts as a defense mechanism to prevent choking and clear the respiratory passages and resolves itself in a short period of time. However, cough can sometimes become excessive, prolonged, and harmful to the body. This is called chronic cough.2

Considering the burden of chronic cough in India and the unmet need for streamlined diagnosis and treatment plans, expert opinions on the current management tactics for chronic cough and therapeutic strategies for primary care physicians have been suggested.

A literature review was carried out based on data from the PubMed database to identify relevant articles between January 2001 and April 2022 using keywords such as “India,” “adults,” “children,” “burden,” “cough,” “asthma,” “antitussives,” “antihistamines,” “opioids,” “antihistamine,” “expectorants,” “mucolytics,” “guidelines,” and “management.” Based on the literature review and clinical practice, a comprehensive approach to the management of cough as a symptom was proposed.

Prevalence of Cough

Unlike acute cough, which lasts for 7–9 days and can affect individuals multiple times per year, chronic cough lasts for >8 weeks.3 It has a higher prevalence in females (children and adults) than in males.4 Chronic cough can result from a number of causes, the most common of which are postnasal drip (upper airway cough syndrome [UACS]), asthma, gastroesophageal reflux disease (GERD), infections, chronic obstructive pulmonary disease (COPD), rhinitis, and drugs like angiotensin-converting enzyme (ACE) inhibitors.1 Nearly 27% of chronic cough cases worldwide are caused due to recurrent respiratory tract infections (RTIs), and 50% are due to asthma, whereas causes such as croup, pneumonia, and tuberculosis are not as common.5 On the contrary, acute cough is mostly caused due to upper RTIs (62%) and bronchitis (33%).6 Cough is a common ailment affecting individuals of all ages. In a European study, about 30% of the participants, aged 20–48 years, were affected by nocturnal cough, 10% by productive cough, and 10% by nonproductive cough.7 In India, cough is prevalent in 5–10% of the population. Cough is the most common complaint in primary care settings in India and across the world. Despite these large numbers of cases, the treatment protocols for cough are not robust and streamlined. Nearly 69% of patients who come in with a complaint of cough are treated for the symptoms without a diagnosis of the underlying cause, whereas 46% of chronic cough cases are left undiagnosed and consequently remain untreated.5,6

There are numerous risk factors and predictors for chronic cough. Chances of development are significantly high in young children aged <12 months. This pattern is also seen in older children who attend childcare in comparison to those who stay in home care.8 Additionally, patients who have a history of chronic cough or eczema have an elevated risk of developing a chronic cough, which is further exacerbated by financial challenges.4

Despite this knowledge, a majority of chronic cough cases of undiagnosed causes prevent the physician from prescribing targeted medicine for treatment. The low percentage of diagnosis is the result of various factors, such as lack of available tests across the country, lack of financial aid in socioeconomically poor regions, and high rate of self-diagnosis combined with self-treatment with over-the-counter medications.9

Etiology of Cough

Acute Cough

Acute cough can occur due to infectious causes such as influenza, pneumonia, sinusitis, and infective bronchitis. In a survey of Indian patients visiting primary care clinics, it was found that upper and lower RTIs were the cause of cough in 12.2 and 8.1% of patients, respectively. Other causes of acute cough are asthma, congestive heart failure, and pulmonary embolism. If the acute cough is of viral origin, treatment can be

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empirical, and it may not require aggressive investigations unless it is associated with other complications.5

**Chronic Cough [Chronic Hypersensitivity Syndrome (CHS)]**

Chronic cough, termed “CHS” by the European Respiratory Society (ERS) Task Force in 2014, is defined as a “clinical syndrome characterized by troublesome coughing triggered by low levels of thermal, mechanical, or chemical exposure.”10 There are a number of ways by which CHS can manifest, caused by diverse physiological conditions. Successful treatment for a case of CHS depends on the correct diagnosis of the underlying cause. Causes for chronic cough vary with the duration of the cough, age, occupation, and geography.

**Productive Cough**

A productive cough is a cough that lasts for >8 weeks and regularly leads to the expectoration of sputum. Productive cough can be caused by bronchiectasis, chronic bronchitis, asthma, eosinophilic bronchitis, and immunodeficiency. Wet coughs are most often treated by expectorants, mucolytics, anti-inflammatory drugs, and antibiotics based on likely causative microorganisms and their sensitivities.3 Pulmonary tuberculosis should be suspected if the cough persists beyond 2 weeks after the initiation of initial treatment and the presence of suggestive signs and symptoms. A positive test with two sputum acid-fast bacilli smears and elevated erythrocyte sedimentation rate will help diagnose pulmonary tuberculosis.6

**Asthmatic Cough**

Asthmatic cough is one such clinical diagnosis. It can be diagnosed by a history consistent with asthma and assessment of one or more biomarkers associated with the condition, such as eosinophilic inflammation, sputum eosinophilia, blood eosinophilia, and exhaled nitric oxide. On the one hand, sputum eosinophilia is the most accurate readout, but not as accessible as the other measures. On the other hand, blood eosinophilia is a simple and easily accessible readout but is affected by seasonal variations and several other factors, making the results less reliable than sputum eosinophilia. However, if there is reasonable concordance between blood and sputum eosinophilia, it is generally adequate for clinical purposes of diagnosis.12-14

**Reflux Cough**

Reflux cough or GERD is another key cause of CHS.4 Although radiographic diagnostic methods, such as esophagram (barium swallow), are available to pinpoint GERD as the cause of CHS, accurate diagnosis is still a major challenge. Esophageal function test or manometry is a good diagnostic tool that helps to distinguish GERD from other esophageal disorders. However, the use of pH electrodes and other instrumentation makes the test difficult to conduct in clinical settings. In addition to imaging results, symptoms such as nighttime coughing, cough associated with reclining, and improvement in patient condition in response to proton pump therapy are useful in confirming the diagnosis of GERD. Successful treatment with proton pump therapy is the most accepted clinical means to establish GERD as the cause of cough in such cases.3,4,12

**Upper Airway Cough Syndrome**

In approximately 30% of CHS patients, UACS is the cause.12 Although it is a prevalent cause of CHS, the underlying pathogenesis is still unclear, making diagnosis and treatment difficult. This becomes further complicated as UACS is known to coexist with other disorders, such as asthma or airway reflux.3

**Other Etiologies**

Approximately 15% of patients taking ACE inhibitors eventually develop CHS. These drugs increase the sensitivity of the cough reflex in patients. Other drugs, such as bisphosphonates or calcium channel antagonists and prostanoid eye drops, can also worsen preexisting cough reflexes and increase the frequency of cough.3,4,12,16

Other than the above-mentioned causes, CHS can also result from environmental irritants, smoking, congestive cardiac diseases, pulmonary tuberculosis, and RTIs. CHS can also be a symptom of chronic respiratory diseases, such as lung cancer, chronic bronchitis, cystic fibrosis, and interstitial lung diseases. In many of these cases, patients might respond poorly to standard treatments like antitussives and anti-inflammatory agents.12,16

**Treatment Strategies for Cough**

According to the recommendations by ERS, before devising a treatment plan for a patient presenting with a cough, it is essential for the physician to10 record the thorough medical history of the patient, which can help identify possible genetic or preexisting causes of cough; perform a complete physical examination to identify specific causes; identify red flag symptoms, which are strongly connected to various causes of cough; differentiate between dry and wet cough; and methodically rule out conditions based on the first three examinations.

Based on the identified cause, chronic cough can be treated by one or a combination of different therapeutic strategies (Table 1).
symptoms such as runny nose and congestion often coincide with cough. In such patient profiles, a combination of antihistamines and decongestants with antitussives can be used for symptomatic relief.\textsuperscript{10}

While most of these therapies have been tested for dry cough, some of them are also effective against wet or productive cough. Treatment is combined with airway clearance techniques, such as nebulized saline, postural drainage, and breathing exercises. In the case of eosinophilic bronchitis, treatment with inhaled steroids might be necessary to provide symptomatic relief and reduce the infectious cause of productive cough, especially when patients have greenish-yellowish sputum or an increase in the quantum of sputum.\textsuperscript{2}

**Expectorants**

Productive cough can be treated with expectorants. The most commonly used expectorants are simple hydration, including bland aerosol, oral hydration, and iodide-containing compounds, such as super-saturated potassium iodide or iodinated glycerol, glyceryl guaiacolate (guaifenesin).\textsuperscript{21} Ammonium chloride, guaiphenesin, and potassium iodide increase secretion volume, and hydration stimulate secretion and reduce mucus viscosity. In cases of asthma, bronchiectasis, chronic bronchitis, and COPD, symptom relief has been reported with expectorants.\textsuperscript{2,22}

**Mucolytics**

Mucolytics change the biophysical properties of secretions by degrading the mucin polymers, deoxyribonucleic acid, fibrin, or F-actin in airway secretions, thus decreasing viscosity. Ambroxol, bromhexine, carbocysteine, erdosteine, N-acetyl cysteine, and sobrerol may alter the volume of secretions or their composition; therefore, they can effectively ease symptoms of respiratory tract diseases such as productive cough. The mucolytic, anti-inflammatory, and antioxidant properties of these molecules all contribute to their clinical benefits. In patients with COPD, they may help to reduce the frequency and duration of exacerbations.\textsuperscript{23}

**Antibiotics**

Antibiotics are not recommended routinely for the management of cough. A trial of antibiotics can be given to patients with the infectious cause of productive cough, especially when patients have greenish-yellowish sputum or an increase in the quantum of sputum.\textsuperscript{2}

**Home Remedies**

Multiple randomized controlled studies have confirmed that honey has therapeutic properties in the treatment of cough. Honey can be recommended before bedtime, especially in children more than 1 year of age, for symptomatic relief from acute dry cough.\textsuperscript{21} In children, the etiology of the cough remains to be evaluated. Asthma, postnasal drip, and bronchitis are treated with antihistamines and bronchodilators. For children aged <2 years, cough suppressants are not recommended. Peripheral-acting antitussives are preferred. Opioids are contraindicated in children <18 years.\textsuperscript{24-26}

**Management of Postinfectious Cough**

In patients with postinfectious cough, the use of inhaled corticosteroids with or without a bronchodilator needs to be considered. For severe paroxysms of postinfectious cough or refractory postinfectious cough, oral corticosteroids can be considered for a short, finite period of time when other common causes of cough (e.g., UACS, rhinosinusitis, asthma, or GERD) have been ruled out. Codeine and dextromethorphan can be used as second-line drugs for short-term symptomatic relief.\textsuperscript{27} Nearly 50% of cough cases are caused by RTIs, resulting in a cough that normally persists for 2 weeks. Incidences of upper RTI are higher in women aged 16–64 years than men of the same age due to higher sensitivity for cough reflex. However, the infection may last longer, for as long as 4 weeks, if the causative agent is Mycoplasma pneumoniae or Bordetella pertussis. Postinfectious cough can also be caused by viral infections, particularly the influenza virus. Sputum buildup and airway inflammation due to the infection result in cough reflex and inflamed sinuses. Inflammatory responses can lead to a worsening of preexisting conditions such as asthma and COPD.\textsuperscript{27}

**Criteria for Referral to Higher Centers**

Detection of any of these red flags signals a need for referral to higher centers or the emergency room in some cases. The severity of symptoms, as well as patient risk factors, dictate whether timely primary care or emergency referral is required.

**Conclusion**

Acute and chronic coughs pose a great burden on the Indian population. There is an urgent need to streamline diagnostic protocols for managing cough, especially CHS. Due to diverse and overlapping causative diseases, the root cause of cough is often not properly identified. This can lead to the superficial treatment of symptoms, leaving the physiological cause undiagnosed and untreated. A comprehensive assessment, including the obtaining of a thorough medical history, a physical examination, and consideration of differential diagnoses, should be done to assess the cause of the cough. Appropriate treatment strategies should be devised based on the findings. Primary care center doctors, who are the first point of contact for patients with cough, need to be trained to look out for red flag symptoms so as to identify and treat the cause at early stages.

**References**


### Table 2: Red flag symptoms for referral

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Referral Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever, weight loss, hemoptysis, and peripheral edema, along with weight gain</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>New cough, change in cough, or voice change in a smoker of &gt;45 years of age</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Individuals aged 55–80 years with a 30-pack-year smoking history</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Dyspnea (at rest or at night)</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Vomiting</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Recurrent pneumonia</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Altered level of consciousness</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Cyanosis (e.g., bluish or purple discoloration of lips/mouth, or fingers/hands, which may feel cold to touch)</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Voice hoarseness</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Trouble eating, drinking, or swallowing</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Cough duration associated with abnormal respiratory examination or chest radiograph</td>
<td>Requires medical attention</td>
</tr>
<tr>
<td>Neonatal onset of cough</td>
<td>Requires medical attention</td>
</tr>
</tbody>
</table>


