

CHEST FRAMED

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Exacerbation of chronic bronchitis in a 65-year-old COPD patient successfully managed with a fixed dose combination therapy



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Case presentation

A 65-year-old male presented to the clinic with a persistent chronic cough and acute dyspnea. He reported a progressive worsening of exertional breathlessness, accompanied by pronounced chest tightness and wheezing. The severity of his symptoms was escalated to the point that he experienced significant shortness of breath with minimal activity,

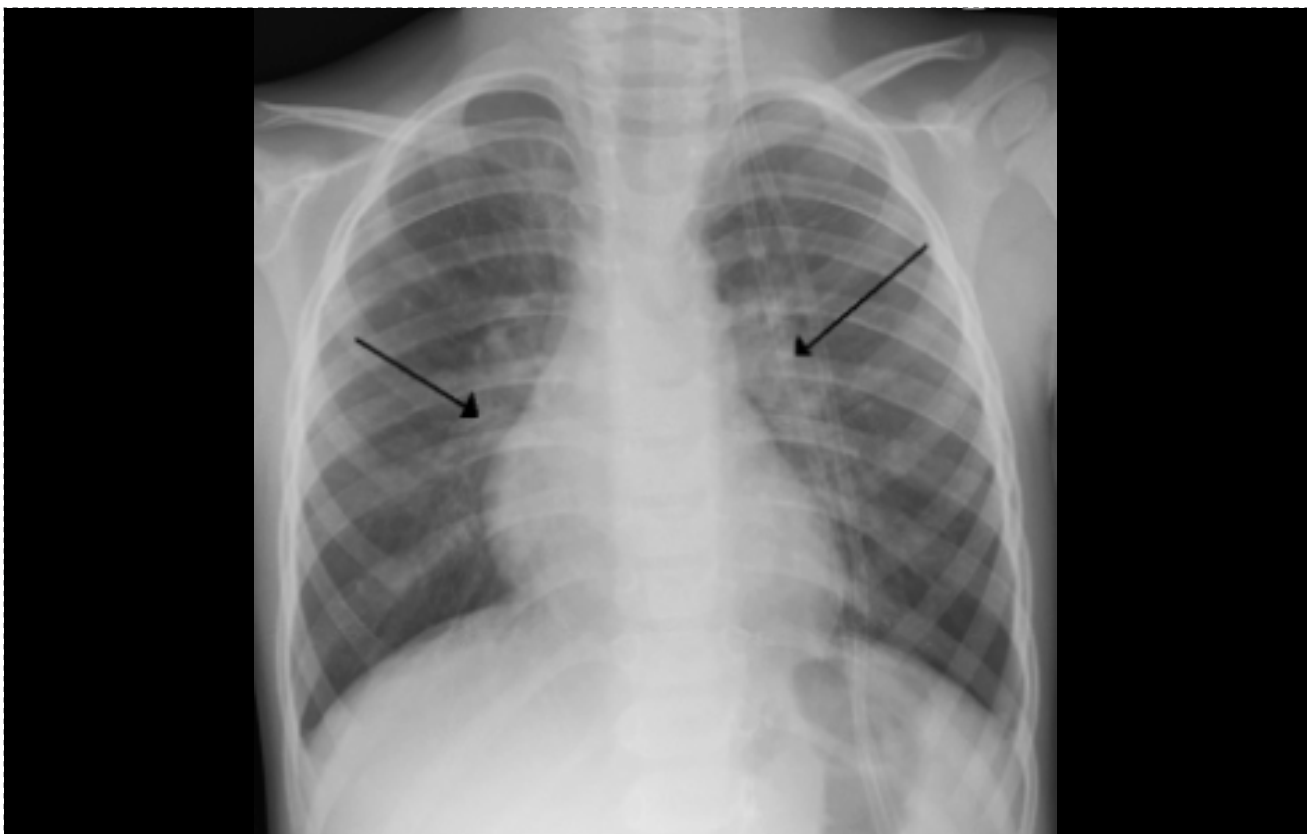


Figure 1. Chest X-ray showing signs of bronchitis

such as walking from his couch to the bathroom. Recently, he had experienced an exacerbation of his chronic bronchitis, characterized by a sudden intensification of his cough, increased shortness of breath, and a marked increase in the volume of phlegm.

Medical history

The patient was diagnosed with Chronic Obstructive Pulmonary Disease (COPD) 5 years ago, with a history of seasonal allergies. He suffers 2-3 acute exacerbations of chronic bronchitis annually, marked by increased cough, dyspnea, and phlegm production, often requiring hospitalization. A former smoker with a history of 20 cigarettes per day, he has since quit. His past medical history include hypertension, hyperlipidemia, and chronic cervical disc disease. Current treatments include beclomethasone dipropionate 200µg for COPD, metoprolol 50 mg daily for hypertension, rosuvastatin 10 mg daily for hyperlipidemia, cyclobenzaprine 15 mg daily for muscle relaxation, and ibuprofen 100 mg as needed for chronic cervical disc disease pain. Recently, symptoms have worsened since he started working at

a sawmill. He denies wheezing, heartburn, regurgitation, nasal issues, sinusitis, hemoptysis, chest pain, or weight loss, which helps exclude other pulmonary disorders.

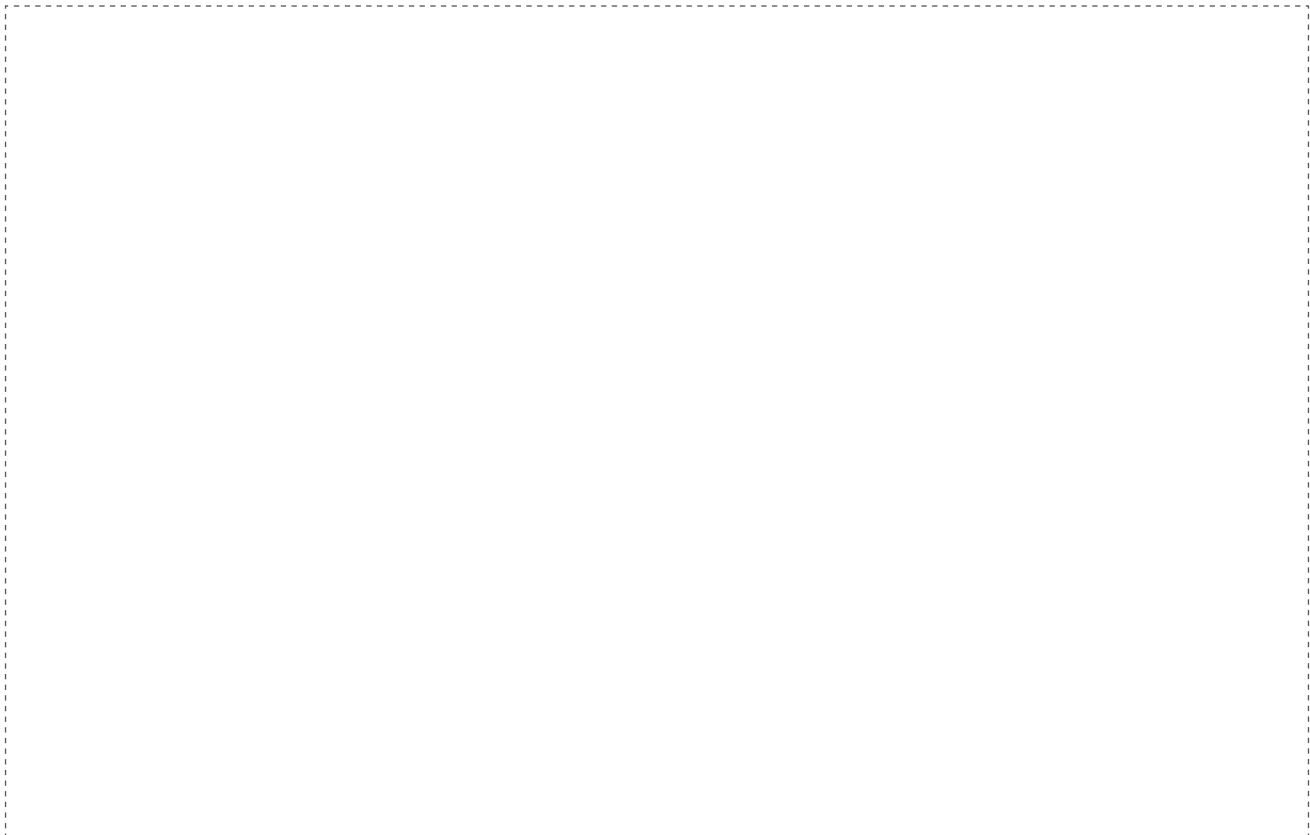
Family history

The patient's mother had cardiovascular disease, including hypertension and coronary artery disease, and also suffered from seasonal allergies. His father had COPD and was a smoker. There was no significant family history of hyperlipidemia, chronic cervical disc disease, or malignancies.

Patient Examination

Vital signs

- Body temperature: 97.4°F
- Heart rate: 75 beats per minute
- Respiratory rate: 28 breaths per minute
- Blood Pressure: 115/80 mmHg
- Body weight: 75 kg
- Body mass index: 25.9 Kg/m²
- O₂ saturation: 88% on room air



Physical examination: The patient appeared to be alert but showed signs of mild respiratory distress, including moderate retractions and pursed-lipped breathing.

Cardiovascular: The heart rate and rhythm were normal. The heart sounds were regular and without murmurs or additional abnormal sounds.

Chest examination: The chest was symmetric with no deformities or masses. Palpation revealed no tenderness, but increased respiratory effort was evident. Auscultation showed diminished breath sounds, a prolonged expiratory phase, faint expiratory wheezes in the upper lung fields, and coarse crackles, indicating airway obstruction and mucus production. The observed pursed-lip breathing correlated with the patient's shortness of breath and chest tightness.

Abdominal examination: Bowel sounds were normal. No distention, tenderness, and masses were observed.

Spirometry: The ratio of forced expiratory volume over 1 second (FEV1) to forced vital capacity (FVC) was <0.7 indicating obstructive lung disease consistent with COPD.

Laboratory investigations

- **Hemoglobin:** 15.3 g/dL
- **Platelets:** 3,80,000 platelets/ mL
- **White blood cell count:** 7500 WBCs/ mL
- **Prothrombin time:** 11.59 seconds
- **Influenza A and B:** Negative
- **Electrocardiogram (ECG):** The heart rhythm and electrical activity were normal.
- **Chest X-ray:** Increased interstitial markings consistent with thickening of bronchial walls with no evidence of lung infiltrates or consolidation

Diagnosis

The patient was diagnosed with an exacerbation of chronic bronchitis, marked by persistent chronic cough, acute dyspnea, and increased phlegm production.

Treatment protocol

The patient was advised to continue his existing medications which included beclomethasone dipropionate 200µg for COPD, metoprolol 50 mg

daily for hypertension, rosuvastatin 10 mg daily for hyperlipidemia, cyclobenzaprine 15 mg daily for muscle relaxation, and ibuprofen 100 mg as needed for chronic cervical disc disease pain. For the exacerbation of chronic bronchitis, he was prescribed 10 ml of a syrup containing Ambroxol (30 mg), Guaifenesin (100 mg), and Terbutaline (2.5 mg) three times daily after meals for two weeks. He was instructed to avoid exposure to environmental pollutants and to use an air filter mask at work. Emphasis was placed on maintaining a healthy diet and engaging in regular physical activity to support overall respiratory health.

Follow-Up

After two weeks of treatment, the patient reported notable improvements in his symptoms. The persistent chronic cough and acute dyspnea was significantly diminished. He experienced a marked reduction in exertional breathlessness, with less pronounced chest tightness and wheezing. He no longer felt significant shortness of breath with minimal activities, such as walking short distances. Additionally, the exacerbation of his chronic bronchitis, characterized by an intensified cough, increased dyspnea, and elevated phlegm production, had substantially improved.

Case conclusion

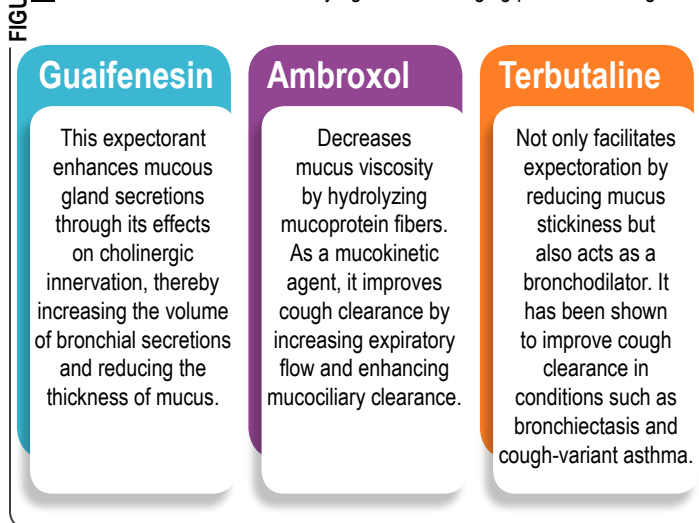
A 65-year-old male with COPD and chronic bronchitis experienced a severe exacerbation with intense cough, acute dyspnea, chest tightness, and increased phlegm. Based on the examination the patient was diagnosed with chronic bronchitis. Post diagnosis, the patient was prescribed a combination syrup containing Ambroxol (30 mg), Guaifenesin (100 mg), and Terbutaline (2.5 mg) three times daily for two weeks to manage the exacerbation of chronic bronchitis, along with recommendations to use an air filter mask and avoid pollutants. Upon follow-up significant improvement was noted in cough, dyspnea, and chest tightness, demonstrating the effectiveness of the prescribed combination therapy.

Discussion

Chronic bronchitis is characterized by persistent cough and sputum production, often due to smoking or

exposure to irritants. The most effective way to eliminate cough is the avoidance of all respiratory irritants.¹ Cough is a crucial physiological reflex for clearing mucus and irritants from the respiratory tract and is a prevalent symptom in clinical settings globally, including in India. The presence of phlegm or mucus can be particularly distressing for patients. Treatment options for productive cough include expectorants, decongestants, antitussives, and antihistamines.² The fixed-dose combination (FDC) of terbutaline, ambroxol, and guaifenesin is effective in managing productive cough because each component works through a different mechanism, enhancing overall treatment efficacy (Figure 2). This combination effectively reduces both cough severity and frequency.²

FIGURE 2 Mechanisms of action for key agents in managing productive cough.²

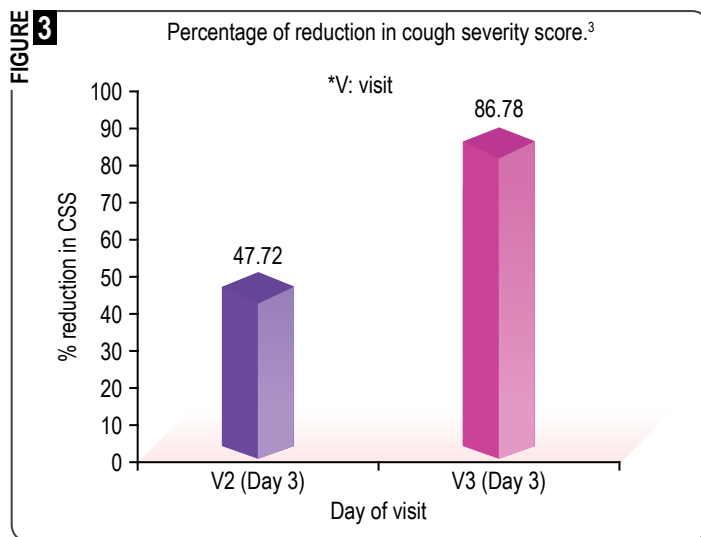


Together, these agents contribute to effective management of productive cough by reducing mucus viscosity and enhancing mucociliary clearance.²

A Phase IV, multi-center clinical trial was conducted to evaluate the efficacy and safety of a FDC syrup

Terbutaline Sulphate 2.5 mg, Ambroxol Hydrochloride 30 mg, and Guaifenesin 100 mg for treating productive cough in Indian patients. Key findings include³:

- **Patient Symptom Scores:** Of the 437 patients, 32.95% had no symptoms (cough severity score [CSS] of 0), 52.25% had minor symptoms (CSS of 1), and 15.78% had mild-to-moderate symptoms (CSS of 2 or higher).
- **Reduction in Cough Severity:** A 47.72% decrease in CSS related to cough severity, frequency, and ease of coughing was noted by day 3 (Visit 2) (Figure 3).
- **Overall Symptom Improvement:** An 86.78% reduction in CSS was reported by day 5 (Visit 3) (Figure 3).



These results demonstrate that the combination of terbutaline, ambroxol, and guaifenesin is both effective and safe for managing productive cough.³

References

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2. Saha S, Patil A, Panda K, et al. Efficacy and safety of terbutaline, ambroxol, and guaifenesin fixed-dose combination in the management of productive cough. *Int J Scient Stud*. 2024; 12(4): 24-35.
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