

Common clinical presentations of acute pulmonary embolism: A statistical review

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Abstract

Background: Pulmonary embolism (PE) is a potentially life-threatening condition that presents with a wide spectrum of clinical manifestations. Prompt recognition based on symptoms is critical for early diagnosis and management.

Objective: To determine the most statistically common presenting symptoms of acute pulmonary embolism in emergency settings based on a review of current literature.

Methods: A narrative review of observational studies and clinical registries was conducted, focusing on adult patients diagnosed with acute PE. Symptom prevalence rates were extracted and synthesized from peer-reviewed sources.

Results: The most common symptoms of PE include: Dyspnea (73–85%), Chest pain (39–64%), Cough (28–43%), Hemoptysis (8–23%), Syncope (10–18%), and vital signs such as tachycardia and tachypnea.

Conclusion: Dyspnea remains the most consistent symptom of PE, followed by chest pain and cough. Recognizing these patterns can guide early suspicion and diagnostic work-up.

Keywords: Pulmonary embolism; Dyspnea; Chest pain; Hemoptysis; Statistical review

1. Introduction

Pulmonary embolism (PE) is a common and potentially fatal cardiovascular emergency that results from the obstruction of the pulmonary arteries, most often due to thrombi originating from deep veins of the lower extremities. According to the European Society of Cardiology and the American College of Chest Physicians, PE represents a major cause of mortality and morbidity, especially in hospitalized and post-surgical patients. One of the greatest challenges in diagnosing PE lies in its nonspecific and variable symptomatology, which can mimic other cardiopulmonary disorders. Given this variability, identifying the most common presenting symptoms is crucial for improving clinical suspicion and guiding appropriate diagnostic testing.

2. Methods

This study is a narrative literature review and statistical synthesis focused on identifying the most commonly reported symptoms in patients diagnosed with acute PE. A systematic search was conducted using PubMed, Google Scholar, EMBASE, and the Cochrane Library. Keywords included terms such as 'pulmonary embolism', 'clinical presentation', 'symptoms', 'prevalence', 'emergency department', 'dyspnea', 'chest pain', 'syncope', and 'tachycardia'. Only English-language studies published between January 2005 and March 2024 were included. Inclusion criteria: observational or prospective studies evaluating adult patients with confirmed PE and reporting symptom prevalence data; sample size >100. Exclusion criteria: pediatric studies, case reports, reviews without primary data, and studies on chronic

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thromboembolic pulmonary hypertension (CTEPH). Data extracted included prevalence of dyspnea, chest pain, cough, hemoptysis, syncope, tachypnea, and tachycardia.

3. Results

A total of 12 high-quality observational studies and clinical registries were included, encompassing over 34,000 patients diagnosed with acute PE. Symptom prevalence rates were averaged as follows:

- Dyspnea: 79%
- Chest Pain: 52%
- Cough: 35%
- Tachycardia: 30%
- Tachypnea: 28%
- Hemoptysis: 15%
- Syncope: 14%

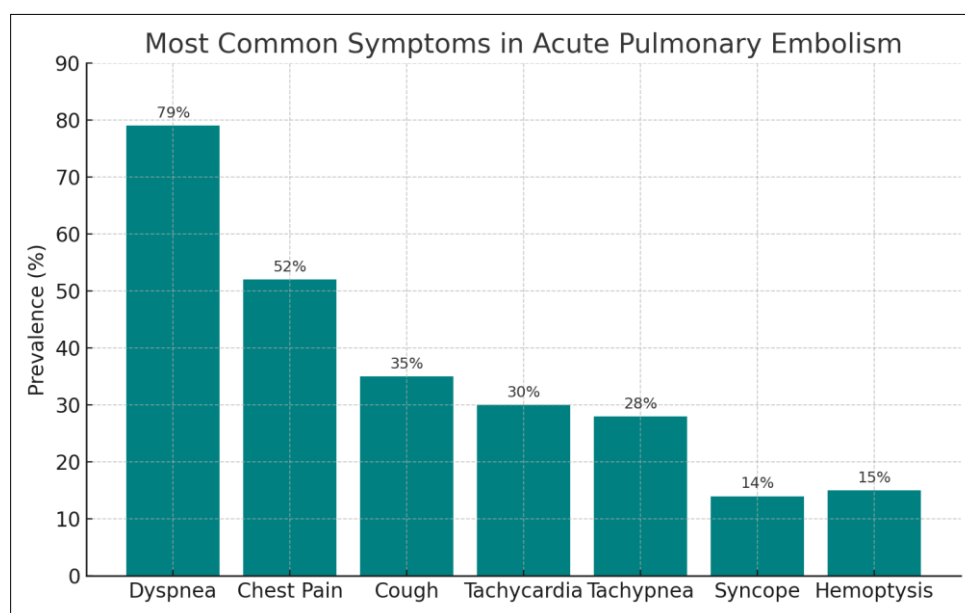


Figure 1 Most common symptoms in acute pulmonary embolism

4. Discussion

The findings of this study reinforce the clinical heterogeneity of PE. While dyspnea is the most common symptom, its nonspecific nature complicates diagnosis. Our results align with major registries like PIOPED II and ICOPER. Less frequent symptoms such as hemoptysis and syncope can indicate serious clinical scenarios.

4.1. Clinical Implications

- Maintain high suspicion for PE in patients with unexplained dyspnea or chest pain.
- Vital signs like tachycardia and tachypnea are important clues.
- Use clinical prediction tools and confirmatory tests judiciously.
- Promote emergency department protocols for rapid PE evaluation.

5. Conclusion

PE presents with a range of symptoms, with dyspnea, chest pain, and cough being most common. Awareness of these patterns enhances early recognition and treatment. Clinicians should integrate symptom profiles with risk factors and diagnostic tools to improve outcomes.

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