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CLINICAL PROFILE OF PULMONARY THROMBOEMBOLISM AT A TERTIARY CARE CENTER IN WESTERN INDIA

Internal Medicine

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KEYWORDS

INTRODUCTION:

Pulmonary thromboembolism is also known as "the great masquerader". It is difficult to diagnose because the signs, symptoms and investigations needed to support the diagnosis are relatively nonspecific. Most patients who succumb to pulmonary embolism do so within the first few hours of the event. Acute PE is globally the third most frequent acute cardiovascular syndrome after myocardial infarction and stroke [1]. Even with rapid advances in the diagnosis and management of PE, it still continues to be underreported. There is paucity of literature on this entity and most of the material is limited to autopsy reports and short case series[2]. Evaluating the possibility of PE in an individual patient is of utmost importance, not only for the interpretation of the diagnostic test results but also for the selection of an appropriate management strategy.

Pulmonary thromboembolism (PTE) remains a significant cause of cardiovascular morbidity and mortality worldwide, with its burden varying considerably across different geographic regions. It is a manifestation of venous thromboembolism (VTE), which also includes deep vein thrombosis (DVT). The clinical presentation of PTE is often nonspecific, ranging from asymptomatic cases to sudden cardiac death, posing diagnostic and therapeutic challenges [3].

Globally, the incidence of PTE is estimated at 39–115 per 100,000 population annually, but this figure is likely underreported in many low- and middle-income countries, including India, due to underdiagnoses and lack of awareness [4,5]. In Western populations, the epidemiology, risk factors, and clinical outcomes of PTE are well-documented. However, data from India remain relatively sparse, and the disease profile may differ due to unique regional factors such as genetic predispositions, lifestyle differences, comorbidities, and healthcare access disparities [6,7].

Indian studies have indicated that patients often present with advanced disease, possibly due to delays in diagnosis and limited access to diagnostic modalities like CT pulmonary angiography (CTPA) [8]. Moreover, certain risk factors like prolonged immobilization, postpartum state, malignancy, and infections contribute to the disease burden in the Indian context [9]. Understanding the clinical profile of PTE in India is crucial for improving early diagnosis, guiding treatment strategies, and reducing associated morbidity and mortality.
This study aims to evaluate the clinical presentation, risk factors, diagnostic modalities, and outcomes of patients diagnosed with pulmonary thromboembolism in an Indian population, thereby contributing to the existing body of knowledge and informing context-specific clinical guidelines.

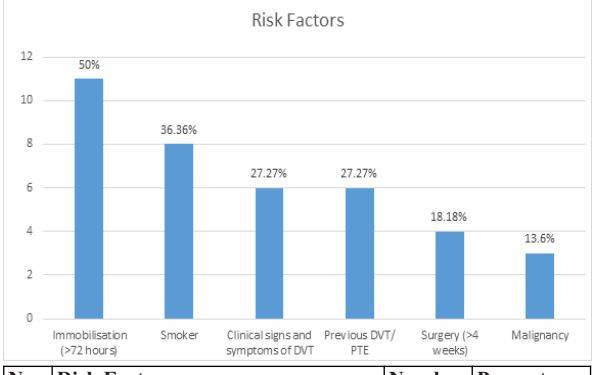
MATERIALS AND METHODS

The present study is a retrospective observational study conducted at MGM hospital, Aurangabad. The study was conducted from January 2024 to December 2024, over a period of 12 months. All cases of pulmonary embolism suspected on basis of clinical presentation were evaluated by a CT Pulmonary Angiogram. Cases confirmed to have a pulmonary embolism were included in the study. Patients with no evidence of pulmonary embolism were excluded from the study. Detailed history and clinical examination of each case was done. Demographic data like age, sex, history of previous co-morbidities and presence of risk factors of pulmonary embolism such as immobilisation, history of DVT, history of smoking, recent surgery and history of malignancy were noted. 2D Echocardiography and B/L lower limb venous Doppler were performed in each patient and findings noted.

RESULTS

A total of 22 patients were included in the study. The mean age observed in our study was 59.41 years with predominant age group being 71-80 years. We obtained a higher prevalence in the male gender i.e. 14 patients (63.6%) than female patients (36.3%). The most common risk factor for embolism was Immobilisation (>72 hours) in 11 out 22 patients (50%), followed by smoking in 8 (36.6%). Clinical signs of DVT and past history of DVT or PE were present in 6 out of 22 patients each (27.27%). History of malignancy was present in 3 out of 22 patients (13.6%) whereas history of a recent surgery was present in 4 out of 22 cases (18.18%).

Age group	Female	Male	Total
11-20	0	1	1
21-30	0	0	0
31-40	0	4	4
41-50	0	1	1
51-60	2	2	4
61-70	1	1	2
71-80	5	5	10
Grand Total	8	14	22

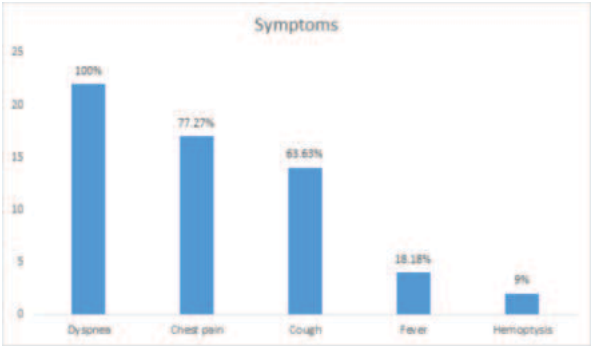


No.	Risk Factor	Number	Percentage
1	Immobilisation (>72 hours)	11	50
2	Smoker	8	36.3
3	Clinical Signs and symptoms of DVT	6	27.27
4	Previous DVT and PTE	6	27.27
5	Surgery (>4 weeks)	4	18.18
6	Malignancy	3	13.6

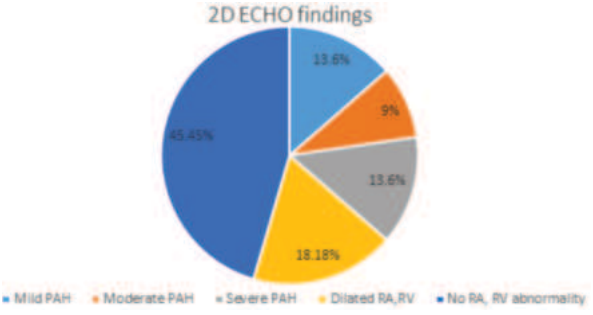
The most common comorbidities associated in the study with PE was

Systemic Hypertension in 9 (40.9%), followed by diabetes mellitus in 4 (18.18%).

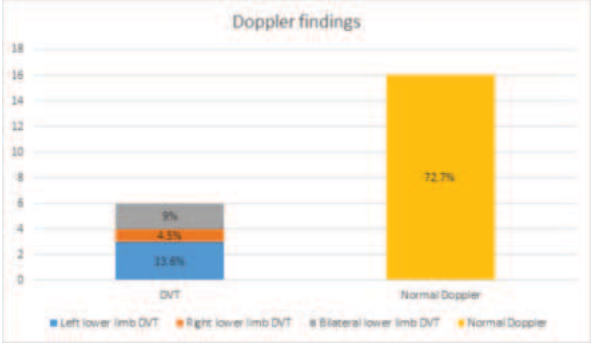
The most common signs noted was dyspnea (100%), followed by chest pain (77.27%), cough (63.63%) and hemoptysis (9%). Fever was seen in 18.18% patients.



2D ECHO findings were s/o mild pulmonary hypertension in 3, Moderate in 2 and severe in 3 out of the total 22 cases. Dilated Right atrium and ventricle were seen in 4 patients whereas 6 were within normal limits.



Evidence of DVT in unilateral left and right lower limbs was 3(13.6%) and 1 (4.5%) respectively. Bilateral involvement was seen in 2 patients (9%)



CT pulmonary angiography findings were suggestive of most common involvement of right segmental pulmonary artery (27.27%), followed by the right Pulmonary artery (22.7%).

No.	CT Pulmonary angiography	Number	Percentage
1	Right PA	5	22.7
2	Left PA	2	9
3	Bilateral PA	2	9
4	Left lobar PA	2	9
5	Right lobar PA	0	0
6	B/L lobar PA	2	9
7	Right segmental PA	6	27.27
8	Left segmental PA	0	0
9	B/L segmental PA	3	13.6

DISCUSSION

Our retrospective study gives an overview of the clinical profile of 22 hospitalised patients in a tertiary care institute in Aurangabad with a CTPA confirmed diagnosis of acute pulmonary thromboembolism. Our study's mean age of 59.4 years, with 45% of patients in the 71–80 age bracket, aligns with epidemiologic data indicating PE incidence rising sharply with age—doubling each decade after 40 years (10). The male predominance (63.6%) contrasts with some large registries showing nearly equal gender distribution, suggesting potential local or sample-specific bias. All the women suffering from the disease in our study were above the age of 51 who had attained menopause, probably suggesting a protective role of estrogen in thromboembolism(11).

Out of the 22 patients included in the study, 8 were already on thromboprophylaxis before the event occurred.

The fact that these 8 patients still developed a thrombotic event despite being on prophylaxis could have important clinical implications. It may suggest:

- **Suboptimal dosing or duration** of thromboprophylaxis
- **Patient-specific risk factors** (e.g., underlying hypercoagulable states, malignancy, obesity)
- **Resistance or non-responsiveness** to standard prophylactic measures
- **Issues with adherence or administration** of the prophylactic regimen

Immobilization (>72 hrs) was the most frequent risk (~50%), consistent with established data: prolonged immobility (≥48 hrs) increases VTE risk, especially with limb immobilization. **Smoking** affected 36% of our cohort. Smoking damages endothelial function and increases platelet aggregation, raising VTE risk by ~40%.(12)

Prior DVT/ PE occurred in ~27%, aligning with known recurrence risks, especially without prophylaxis.

Surgery (past month: 18%) and **malignancy** (14%) were less common but recognized causes; studies report VTE risk peaks post-major surgery and in active cancer patients, sometimes reaching 50% in autopsy series. (13)

Hypertension (41%) and diabetes (18%) often coexist with PE but are less influential than direct thrombogenic factors. Their presence may exacerbate cardiovascular strain in PE, though hypertension's direct role is less clear(14).

All patients had **dyspnea**, matching rates of 73–100% in large cohorts(15). **Chest pain** (77%) was somewhat higher than typical 66% from PIOPED II, but still within expected ranges. Prospective Investigation of Pulmonary Embolism Diagnosis II (PIOPED II) was a multicenter study that assessed the diagnostic accuracy of CT pulmonary angiography (CTPA) for suspected pulmonary embolism (PE).

Cough (64%) exceeded the often-cited 37%, perhaps reflecting regional differences or infection overlap.

Hemoptysis (9%) was lower than classical teaching. **Fever** (18%) mirrors fever presence in 14–43% of PE patients.

Evidence of pulmonary hypertension (mild to severe in 36%) and RA/RV dilation in 18% is consistent with echocardiographic signs of right-heart strain, commonly reported in submassive and massive PE cases.

Around 28% of patients had evidence of thrombus on venous Doppler. Out of the 22, 6 patients were having preexisting DVT or recurrent DVT.

Emboli were most often in **right segmental** (27%) and **main PA** (22.7%). Segmental involvement is common in non-massive PE, whereas central emboli in larger vessels are more likely linked with hemodynamic instability—this spectrum aligns with typical PE distribution patterns. (16)

Out of the 22 patients, 6 patient succumbed to the disease, whereas 16 were discharged and are on follow-up.

Our evidence supports prophylactic strategies-early mobilization, mechanical or pharmacologic interventions-for high-risk individuals, particularly post-surgery or immobilization.

Routine use of CT pulmonary angiography and lower limb Doppler aids early detection by identifying PE even with atypical presentations.

Abnormal echocardiographic findings (RA/RV dilation, PAH) can signal right-heart strain. Above interventions can guide in early detection and more aggressive treatment thus reducing mortality.

CONCLUSION

This study highlights the clinical characteristics, risk factors, and outcomes of patients diagnosed with acute pulmonary thromboembolism in a tertiary care setting. The findings reinforce the importance of early identification of at-risk individuals, particularly elderly males with prolonged immobilization-a leading risk factor in this cohort. Dyspnea remained the most consistent clinical symptom, while echocardiographic signs such as pulmonary hypertension and right heart dilation indicated more severe disease.

Despite diagnostic advancements such as CT pulmonary angiography and Doppler ultrasound aiding in early detection, the in-hospital mortality rate in this study was alarmingly high (72.7%). This underscores the need for heightened clinical vigilance, timely diagnosis, and aggressive management strategies. The study also emphasizes the value of preventive measures, especially thromboprophylaxis in high-risk patients, to reduce the burden of this potentially fatal condition.

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