

Clinicoetiological Profile of Pulmonarythrombo Embolism in a Tertiary Care Hospital

Dr. Sachin Aurade¹, Dr. Hemamalini Gururaj^{2*}, Dr. ArchanaDambal³, Dr. Neelakanth S Patil⁴

¹Post Graduate in Department of General Medicine, SDM Medical College, Sri Dharmasthala Manjunatheshwara University Dharwad Karnataka India

²Professor in Department of General Medicine, SDM Medical College, Sri Dharmasthala Manjunatheshwara University, Dharwad Karnataka India

³Professor in Department of General Medicine, SDM Medical College, Sri Dharmasthala Manjunatheshwara University, Dharwad Karnataka India

⁴Assistant Professor in Department of General Medicine, SDM Medical College, Sri Dharmasthala Manjunatheshwara University, Dharwad Karnataka India

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*Corresponding author: Dr. Hemamalini Gururaj

Abstract

Original Research Article

Background: Pulmonary embolism is a potentially fatal disorder for which anticoagulation therapy improves the outcome. Aim is to study the clinical profile, diagnostic methods and management in patients with pulmonary embolism. **Methods:** Retrospective assessment of clinical features and management of 34 patients presenting with pulmonary embolism from January 2019 to December 2019 in the department of General Medicine at SDM CMS & H tertiary care centre. **Results:** 34 patients who were diagnosed to have pulmonary embolism with a mean age 51.3 years were included in the study. Dyspnea (30) and lower limb swelling were predominant symptoms. The most common ECG finding was sinus tachycardia in all patients followed by Q3T3 in 11 patients followed by RBBB in 9 patients followed by S1T3 and S1Q3T3 in 5 patients and T wave inversion in v2-v5 in 3 patients. 32 patients showed positive D dimer levels. 8 patients had hypoxia on arterial blood gas analysis. 15 patients had lower limb proximal deep vein thrombosis. Echocardiography was done in all patients. 26 patients had pulmonary arterial hypertension and 23 patients had RV dysfunction. **Conclusion:** Pulmonary embolism is a common problem and can be easily diagnosed provided it is clinically suspected. Early diagnosis and aggressive management is the key to successful outcome.

Keywords: Pulmonary embolism, Deep vein thrombosis, Clinical profile.

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INTRODUCTION

Acute pulmonary embolism (APE) is the most serious clinical presentation of venous thromboembolism (VTE) with fatal pulmonary embolism (PE) being a common cause of sudden death, usually resulting from a complication of deep venous thrombosis (DVT)[1].

PE carries a significant risk of mortality. Nearly 10% of patients who die of PE do so within 1 hour of the onset of symptoms [2]. The few population-based studies have demonstrated an average annual incidence of DVT and PE of 48 and 23 per 100,000 persons, respectively [3-4].

Pulmonary embolism is a potentially fatal disorder for which anticoagulation therapy improves the outcome. Untreated, clinically apparent pulmonary

embolism has been associated with a 30 percent hospital mortality rate, whereas the mortality rate for treated patients has been reported to be in the range of 8 percent [5-9].

PE risk factors include obesity, immobilization, cigarette use, cancer, surgery, trauma, pregnancy, oral contraceptives or hormone replacement therapies, and a prior history of PE or a known hypercoagulable disorder. However 30% of patients with PE have no detectable provoking factors and, as shown in the Emergency Medicine Pulmonary Embolism in the Real World Registry (EMPEROR), International Cooperative Pulmonary Embolism Registry (ICOPER), and Registro Informatizado de Enfermedad Trombo Embólica (RIETE) registries, the mean age of PE patients ranges from 56 to 66 years, with older people and females having mild prevalence [10-13]. Clinical presentation of PE varies from an

asymptomatic small pulmonary embolus with low mortality to a massive PE resulting in failure of the right ventricular (RV) with shock, and/or death [14].

Our study was conducted to understand the clinical profile of patients with Pulmonary Embolism and its response to treatment.

MATERIALS AND METHODS

A retrospective study of patients admitted with pulmonary thromboembolism January 2019 to December 2019 in the department of General Medicine at SDM CMS & H tertiary care centre were selected. All patients diagnosed as pulmonary embolism were included in the study. Their clinical presentation, investigation and management were analyzed. A patient was diagnosed to have pulmonary embolism if there is evidence of thrombus in CT pulmonary angiogram.

Patients with pulmonary embolism were classified as massive if there was evidence of hemodynamic compromise (defined as systolic BP <90 mmHg) and as submassive if there was right ventricular dysfunction on echocardiography with no hemodynamic compromise.

D-Dimer testing and troponin i was done, normal value is of D-Dimer 0–500 ng/ml. any value greater than 500 ng/ml of D-Dimer is considered positive. Troponin I value greater than 0.03 was considered abnormal. Echocardiogram was done and pulmonary arterial pressure and RV function from echocardiograph noted. Pulmonary hypertension was categorized as mild, moderate, or severe based on pulmonary artery systolic pressures (mild: 40–45 mmhg, moderate: 46–60 mmhg, or severe >60 mmhg). CT pulmonary angiogram was done. Arterial blood gas analysis, D- Dimer, Troponin I, and Chest x-ray, 2d Echocardiography and CTPA were done along with routine investigations in all patients. Patients who were eligible for thrombolytic therapy were lysed using streptokinase, alteplase, urokinase and tenecteplase. Rest of the patients was anticoagulated with low molecular weight heparin and unfractionated heparin based on GFR.

RESULTS

34 patients who were newly diagnosed to have pulmonary embolism were included in the study. Their mean age was 51.3 years. Among 34 patients 7(20.59%) patients were aged between 20-40 years, 12 (35.29%) were aged between 40-60 years and 15(44.12%) were aged above 60 years as shown in figure-1. Among 34 patients, 19 (55.88%) were males and 15 (44.12%) were females as shown in figure-2.

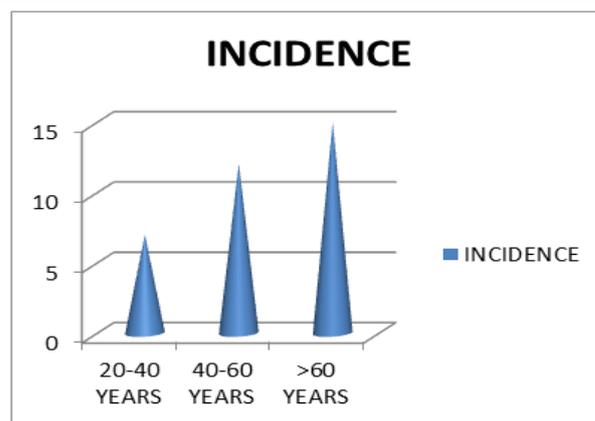


Fig-1

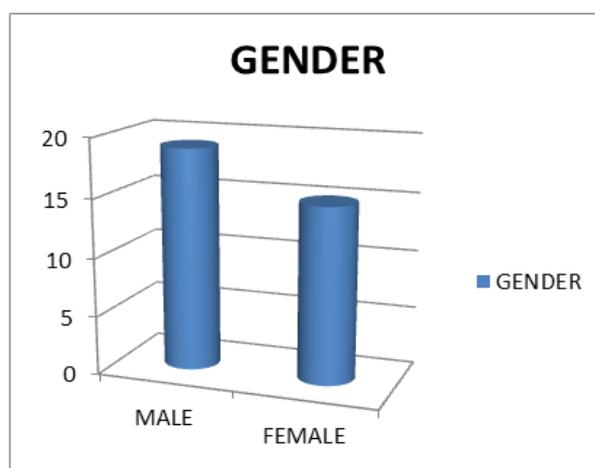


Fig-2

The most common clinical presentation is dyspnea in 30 patients (88.24%) followed by lower limb swelling 15 patients (44.12%). The other symptoms being chest pain 7 patients (20.59%), fever 5 patients (14.57%) and cough 5 patients (14.57%) as shown in figure 3.

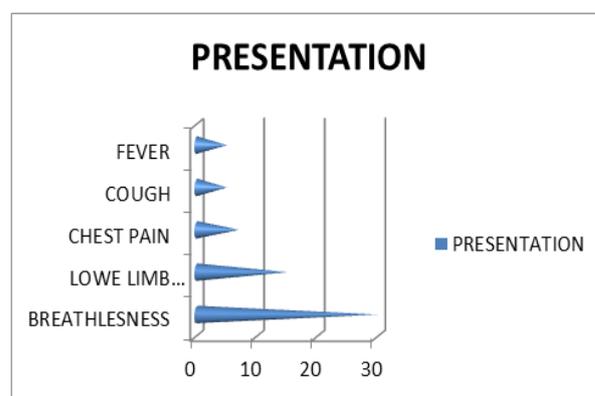


Fig-3

The most common ECG finding was sinus tachycardia in 33(97.06%) patients followed by Q3T3 in 11(32.35%) patients followed by RBBB in 9(26.47%) patients followed by S1T3 and S1Q3T3 in

(14.71%) patients and T wave inversion in v2-v5 in 3(8.82%) patients.

The most common comorbidity associated was Diabetes Mellitus seen in 11 patients (32.35%) followed by Hypertension seen in 8 patients (23.53%). Other comorbid illnesses were CVA, Pneumonia & Pulmonary Tuberculosis.

32 patients showed positive D dimer levels. More than 5000 ng/ml in 7(20.59%) patients, 4000-5000ng/ml 4(11.76%) patients, 3000-4000ng/ml in 7(20.59%) patients, 2000-3000 ng/ml in 6(17.65%) patients, 1000-2000 ng/ml in 3(8.82%) patients and less than 1000 ng/ml in 3(8.82%) patients and 2(5.88%) patients had less than 500ng/ml. 2(5.88%) patients D-Dimer could not be traced.

8(23.53%) patients had hypoxia on arterial blood gas analysis. 15 (44.12%) patients had lower limb proximal deep vein thrombosis.

Echocardiography was done in all patients. 17 patients (50%) had pulmonary arterial hypertension and 2(5.88%) had mild PAH, 8(23.53%) had moderate PAH and 7(20.59%) had severe PAH, whereas 17(50%) patients echocardiography was normal

Among 34 patients who underwent CTPA, 14(41.18%) patients had thrombus located in the main and lobar arteries. The remaining 20(58.82%) patients had thrombus seen in subsegmental vessels.

Out of 34 patients, 14 patients (41.18%) were thrombolysed, Streptokinase was used in 7(20.59%) patients, Alteplase was given in 5(14.71%) patients and tenecteplase was given in 1(2.94%) patient and urokinase was given in 1(2.94%) patient. In the remaining 20(58.82%) patients, were treated with LMWH and UFH based on GFR. 6(17.65%) patients were intubated and mechanical ventilator support was given.

DISCUSSION

Pulmonary embolism presents with a wide clinical spectrum, from asymptomatic disease to life threatening massive PE that causes hypotension and cardiogenic shock. The clinical presentation and the investigations including electrocardiography and analysis of arterial blood gases cannot be relied on to confirm or rule out PE because of lack of adequate specificity [15].

In our study among 34 patients included in the study mean age were 51.3 years and 19 were males and 15 were females. 15 patients were aged above 60 years, followed by 12 aged between 40-60 years and 7 aged between 20-40 years.

According to study conducted by Natalia Tsymbalyuk *et al.* in 2012 "Study of pulmonary embolism prevalence depending on age and sex by autopsy data" Out of 2260 autopsies done during the period of 1993-2002 showed that PE in the structure of pathologic diagnosis occurred in 121 cases (5.3%), mean time of development of PE symptoms was 6.3±2.3 days. 65 of them were males (53.7%) and 56 - females (46.3%) with average age 64.1±2.3 years [16].

In our study we found that most common clinical presentation is dyspnea in 30 patients (88.24%) followed by lower limb swelling 15 patients (44.12%). The other symptoms being chest pain 7 patients (20.59%), fever 7 patients (20.59%) and cough 5 patients (14.57%).

In our study most common ECG finding was sinus tachycardia in 33 patients followed by Q3T3 in 11 patients followed by RBBB in 9 patients followed by S1T3 and S1Q3T3 in 5 patients and T wave inversion in v2-v5 in 3 patients and one patient had normal sinus rhythm.

1. In a similar study conducted by S. Calvin Davidsingh *et al.* "Study of clinical profile and management of patients with pulmonary embolism – Single center study".

The most common clinical presentation is dyspnea (91.4%) followed by syncope (22.8%). The other symptoms being chest pain (17.1%), fever (11.4%) and cough (11.4%). The most common finding in ECG is sinus tachycardia (91.4%) followed by RV strain pattern (65.7%), S1Q3T3 pattern (34.2%) and RBBB (20%) [17].

In our study 30 patients had positive D-dimer. 8 patients had hypoxia on ABG 15 patients had lower limb proximal DVT.

In the study of Hammond and Hassan [18], retrospective analysis of a sequential series of 376 patients revealed that no patient with D-dimer of <275 ng/ml was diagnosed with pulmonary embolism, irrespective of clinical probability. Egermayer *et al.* [19] showed that a negative D-dimer, a paO_2 of ≥ 80 mmHg and a respiratory rate less than 20, also had a negative predictive value of 100% in patients with suspected pulmonary embolism

In a study conducted by Moser K.M *et al.* "Frequent asymptomatic pulmonary embolism in patients with deep venous thrombosis". Doppler ultrasound of lower limb veins is a useful investigation in the diagnosis of PE. Doppler ultrasonography is positive in 10–20 percent of all patients without leg symptoms or signs who undergo evaluation and in approximately 50 percent of patients with proven embolism [20].

Echocardiography was normal in 17 patients and pulmonary arterial hypertension was present in 17 patients. Among 34 patients who underwent CTPA, 14(41.18%) patients had thrombus located in the main and lobar arteries. The remaining 20(58.82%) patients had thrombus seen in subsegmental vessels.

Out of 34 patients, 14 patients were thrombolysed with Streptokinase in 7 patients, Alteplase in 5 patients, Tenecteplase in 1 patient and Urokinase in 1 patient. Remaining 20 patients, were treated with LMWH and UFH based on GFR. 6 patients needed endotracheal intubation and ventilator support was given.

CONCLUSION

Pulmonary thrombo embolism is a common clinical problem which can be easily diagnosed provided there is high index of clinically suspicion. Early diagnosis and aggressive management is the key to successful outcome. In this part of North Karnataka we do get significant number of cases of PTE as ours is a tertiary referral care centre. Most of the cases were successfully managed with available treatment modalities.

LIMITATIONS

1. Etiology was difficult to evaluate due to financial constraints of the patients.
2. It was difficult to follow up patients after discharge.

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