ORIGINAL RESEARCH PAPER

Pulmonary Medicine

SYM PTOMATOLOGY AND PHYSICAL FINDINGS IN PATIENTS WITH PULMONARY EMBOLISM

KEY WORDS:

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ABSTRACT

INTRODUCTION: Pulmonary embolism is the third most common cause of acute cardiovascular emergency. Venous thromboembolism contributes substantially to patient morbidity, mortality and cost of management. Pulmonary embolism accounts for 5-10% of death in hospitalized patients. Pulmonary embolism is the most common cause of preventable hospital death. Clinical presentation of pulmonary embolism is variable and nonspecific. Hence diagnosis of pulmonary embolism may be missed. However, early diagnosis is essential since immediate appropriate treatment reduces morbidity and mortality. Up to 10% of symptomatic pulmonary embolism is fatal in the first hour and mortality can be reduced from 30% to nearly 8% if treated early. Hence it essential for clinicians to be familiar with the symptoms and clinical features of pulmonary embolism so that early diagnosis can be made.

OBJECTIVES OF STUDY: To study the symptomatology and clinical features in hospitalised patients with pulmonary thromboembolism.

MATERIALS AND METHODS: This was a prospective, descriptive clinical study. Data for the current study was collected from the patients who were admitted in a tertiary care teaching hospital in south India. Study was conducted from October 2017 to September 2018 in patients with diagnosis of pulmonary thromboembolism. All patients with suspected pulmonary thromboembolism were evaluated. Diagnosis was confirmed by computerised tomography pulmonary angiography.

RESULTS: A total of thirty patients, 18(60%) males and 12(40%) females diagnosed to have Pulmonary Embolism were included in the study. Our study found mean age of the study group was 50.4±17.5 years and that of male patients were 48.9 ±18.7 years and female patients was 52.8±15.9 years. Of the diagnosed cases of pulmonary embolism 96.7% of the patients presented with chief complaints of dyspnoea. 33.3% of the patients had pleuritic chest pain. Leg pain (30%) and Leg swelling (30%) was the 3rd most common presenting complaint. On the examination the most common sign was tachypnea. 93.3% of the patients had tachypnea. Second most common presenting sign was tachycardia with 83.3%. Next most common presentation was hypotension and leg swelling with 40% each respectively and raised JVP and loud S2 with 26.7% each.

CONCLUSION: Most common symptom in patients with pulmonary embolism is breathlessness. Most common sign in patients with pulmonary embolism is tachypnea and tachycardia. Hence if any hospitalised patient develops new onset of breathlessness with tachypnea and tachycardia without any other obvious cause pulmonary embolism should be considered as a differential diagnosis.

INTRODUCTION

Pulmonary embolism is the third most common cause of acute cardiovascular emergency. In the western world, the incidence is one case of deep vein thrombosis and 0.5 cases of pulmonary embolism per 1000 population / year[1]. Autopsy studies have shown that the incidence of venous thromboembolism in hospitalized patients to be as high as 34.7% with fatal pulmonary embolism in 9.4% of cases[2-6]. In a post-mortem study of 1000 autopsies from India, the overall incidence of Pulmonary embolism in adult medical autopsies was 15.9% and it was a terminal event in almost 80% of these patients[7].Though the exact incidence of venous thromboembolism in the Indian population is not known because of non-uniform reporting of such incidents, its incidence is not expected to be different from that in the western population[8].

Venous thromboembolism contributes substantially to patient morbidity, mortality and cost of management. It has been estimated that between 5 Lakh and 2 million venous thromboembolism cases including pulmonary embolism occur annually in USA[9]. Pulmonary embolism accounts for 5-10% of death in hospitalized patients[10]. Pulmonary embolism is the most common cause of preventable hospital death. In fact, an estimated 10 per cent of symptomatic pulmonary embolism causes death within one hour of onset[11].Another 5% of patients die after starting treatment. About a third of patients are left with some residual symptoms and 2% develop thromboembolic pulmonary hypertension due to unresolved pulmonary embolism[12].

Clinical presentation of pulmonary embolism is variable and nonspecific. Hence diagnosis of pulmonary embolism may be missed. However, early diagnosis is essential since immediate appropriate treatment reduces morbidity and mortality. Up to 10% of symptomatic pulmonary embolism is fatal in the first hour and mortality can be reduced from 30% to nearly 8% if treated early[13]. Hence it essential for clinicians to be familiar with the symptoms and clinical features of pulmonary embolism so that early diagnosis can be made.

AIMS AND OBJECTIVES

To study the symptomatology and clinical features in hospitalised patients with pulmonary thromboembolism.

MATERIALS AND METHODS

STUDY DESIGN:

A prospective, descriptive clinical study

SOURCE OF DATA:

Data for the current study was collected from the patients who were admitted in a tertiary care teaching hospital in south India. Study was conducted from October 2017 to September 2018 in patients with diagnosis of pulmonary thromboembolism. All patients with suspected pulmonary thromboembolism were evaluated. Diagnosis was confirmed by computerised tomography pulmonary angiography.

SAMPLE SIZE OF ESTIMATION

Sample size was calculated using the formula
$N = 4*P*Q/L^2$

Taking the expected proportion of patients with abnormal ECHO findings as 80% and

20% relative precision, the sample size was calculated to be 30. Sample size was calculated using Open EPi software version 3.0. Alpha error was taken as 5% (95% significance level).

INCLUSION CRITERIA:

All patients age above 15 years who were diagnosed with pulmonary thromboembolism by computerized tomography pulmonary angiography (CTPA) were included in the study.

METHOD OF COLLECTION OF DATA:

All patients admitted in a tertiary care hospital in whom pulmonary thromboembolism was suspected were evaluated. Only patients who were diagnosed to have pulmonary thromboembolism with computerized tomography pulmonary angiography (CTPA) were included in the study group after obtaining written consent. Demographic profile, details of disease, co-morbidities, details of risk factors, details of investigations was collected. For clinical assessment of pulmonary embolism "Wells Scoring System" was used. Data collected was analysed by correlation studies.

A total of 30 patients who fulfilled the inclusion criteria were included in this study.

The results were analyzed to assess the symptomatology and clinical profile.

STATISTICAL METHODS:

Data was entered in Microsoft Excel spreadsheet. The statistical parameters used were the Continuous variables such as age was expressed in terms of average ± standard deviation(SD).Categorical variables such as clinical signs, symptoms, risk factors, ECG findings etc were presented as percentages. Bar charts and pie charts were used to describe the data. Analysis was done in SPSS software version 17.0

RESULTS

A total of thirty patients, 18(60%) males and 12(40%) females diagnosed to have Pulmonary Embolism were included in the study. Our study found mean age of the study group was 50.4±17.5 years and that of male patients were 48.9 ±18.7 years and female patients was 52.8±15.9 years. The maximum number of pulmonary embolism in males occurred in the age group of 30 to 44 years (33.3%), where as in females it was in the age group ≥60 years (33.3%). Overall majority of pulmonary embolism cases were in age group of ≥60 years (33.3%).
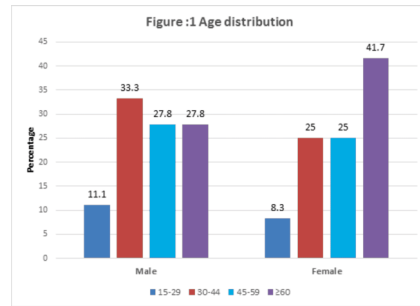
Figure :1 Age distribution

Of the diagnosed cases of pulmonary embolism 96.7% of the patients presented with chief complaints of dyspnea. 33.3% of the patients had pleuritic chest pain. Leg pain (30%) and Leg swelling (30%) was the 3rd most common presenting complaint

Figure :2 Clinical features
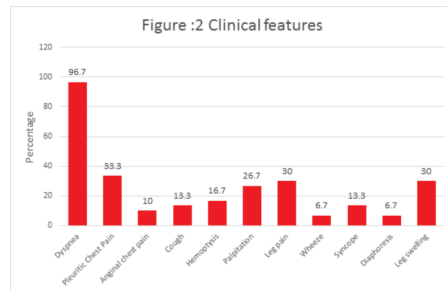
On the examination the most common sign was tachypnea. 93.3% of the patients had tachypnea. Second most common presenting sign was tachycardia with 83.3%. Next most common presentation was hypotension and leg swelling with 40% each respectively and raised JVP and loud S2 with 26.7% each. Other signs seen were crepitations followed by rhonchi.

Figure: 3 Clinical signs
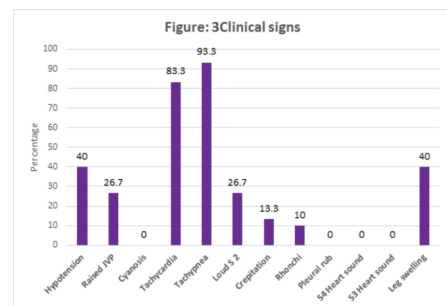
DISCUSSION

There were 65 cases suspected of pulmonary embolism, out of which 30 cases were diagnosed as pulmonary embolism by CTPA. Out of 30 diagnosed cases of pulmonary embolism 7 patients had massive pulmonary embolism, 14 patients had sub massive pulmonary embolism; 9 (30%) were classified as having non massive pulmonary embolism

Present study included Pulmonary Embolism patients aged above 15 years. In our study, out of thirty patients, 18(60%) males and 12(40%) female patients were found to have pulmonary embolism. Sex ratio in our study was 1.5:1 (male: female). Male preponderance was found in other studies also[4]. Reason for this may be usually male patients outnumber females in the hospitals and the number of male patients with risk factors for pulmonary embolism also outnumber females.

Mean age of the study group was 50.4 ± years and that of male patients were 48.9± years and female patients was 52.8± years. The maximum number of pulmonary embolism in males occurred in the age group of 30 to 44years (33.3%), where as in females it was in the age group of ≥60 years (41.7%). Reason for this may be many of these males were admitted in surgical and orthopaedic departments with increased risk factors for venous thrombo

embolism. Overall, in both males and females majority of pulmonary embolism cases were in age group of ≥60 years (33.3%). Other studies also reported that incidence of pulmonary embolism increases with age[3, 4]. Above the age of 60 years the incidence of pulmonary embolism in female patients was 41.7% and in male patients it was 27.8%. This suggests the incidence of pulmonary embolism was more in females compared to male patients after 60 years of age.

In present study dyspnea was seen in 29(96.7%) patients, pleuritic chest pain in 10(33.3%) patients, cough in 4(13.3%) patients, leg pain in 9(30%) patients, hemoptysis in 5(16.7%) patients, palpitation in 8(26.7%) patients, wheezing in 2(6.7%) patients, syncope in 4(13.3%), angina like pain in 3(10%),diaphoresis in 2(6.7%) and leg swelling in 12(40%) .In the study by Stein PD et al[14], dyspnea was seen in 78% patients, leg pain in 27%. These features concurred with the study includes leg pain, hemoptysis, angina like pain, diaphoresis and loud P2. Rest of the features like pleuritic chest pain, cough, palpitations, and syncope were not concordant with Stein PD et al study.

In present study syncope was seen in 13.3% patients, whereas in study by Anderson et.al[6] the syncope associated with pulmonary embolism was 10%. Similarly, haemoptysis was seen in 16.7% in our study, whereas in study by Anderson et.al[6] haemoptysis associated with 13% cases. In present study dyspnea was seen in 29(96.7%) patients whereas in the study by Agarwal et. al[2], dyspnea was seen in 22(91.7%) patients. This infers that the clinical presentation of pulmonary embolism is variable and nonspecific in hospitalized patients. Symptoms in pulmonary embolism will depend on degree and site of occlusion of the pulmonary artery and co morbidities in the patient.

In present study, tachypnea was seen in (93.3%), pulmonary crackles or crepitations in 13.3%, tachycardia in 83.3%, leg swelling in 40% patients, loud P2 in 26.7%, third heart sound in 6%, DVT in 26%. In the study by Stein PD et al[14] pulmonary crackles or crepitations was seen in 55%, tachycardia in 30%, leg swelling in 31%patients, loud P2 in 23%, third heart sound in 5%, pleural rub in 4%, DVT in 15%.

CONCLUSION

Most common symptom in patients with pulmonary embolism is breathlessness. Most common sign in patients with pulmonary embolism is tachypnea and tachycardia. Hence if any hospitalised patient develops new onset of breathlessness with tachypnea and tachycardia without any other obvious cause pulmonary embolism should be considered as a differential diagnosis.

REFERENCES

1. Heit JA. The epidemiology of venous thromboembolism in the community.Arterioscler ThrombVasc Biol. 2008 March; 28(3): 370–372.doi:10.1161.
2. Agarwal S, Lee AD, Raju RS, Stephen E: Venous Thromboembolism: A problem in the Indian / Asian population? Indian J. Urol 2009 : 25 : 11 – 16. 1.
3. Bricola C, Petilo SA, Paiva EF, Lichtenstein A, Gianini RJ, Duarte JG, Shinjo SK, Eluf-Neto J, Arruda Martins M. Fatal pulmonary embolism in hospitalized patients: a large autopsy-based matched case-control study. Clinics. 2013 May;68(5):679-685.
4. Sweet III PH, Armstrong T, Chen J, Masliah E, Witucki P. Fatal pulmonary embolism update: 10 years of autopsy experience at an academic medical center. JRSM short reports. 2013 Jul 30;4(9):20425333313489824.
5. Alikhan R, Peters F, Wilmott R, Cohen AT. Fatal pulmonary embolism in hospitalised patients: a necropsy review. J Clin Pathol 2004;57:1254–1257.
6. Anderson FA Jr, Zayaruzny M, Heit JA, Fidan D, Cohen AT. Estimated annual numbers of US acute-care hospital patients at risk for venous thromboembolism. Am J Hematol 2007;82:777–782.
7. Kakkar N, Vasishta RK. Pulmonary embolism in medical patients: an autopsybased study. ClinApplThrombHemost 2008; 14: 159-167.
8. Parakh R, Kakkar VV, Kakkar AK. Management of venous thromboembolism. J Assoc Physicians India 2007;55:45-70.
9. Deitcher SR, Rodgers GM : Thrombosis and antithrombotic therapy : In Greevn JP, Foerster J, Rodgers GM et al. edswintrobes clinical Haematology12th Edition, Lippincott, Williams and Wilkins, 2009 : 1464-1508.
10. Cohen AT, Tapson VF, Bergmann JF et al : Venous thromboembolism risk and prophylaxis in the acute hospital care setting (ENDORSE Study); a multinational cross-sectional study, Lancet 2008; 371 : 387 – 94. Erratrumin : Lancet 2008 : 371 : 1914.
11. Kearon C. Natural history of venous thromboembolism.Circulation 2003; 107: I-22-30.
12. Jaff MR, et al. Management of massive and submassive pulmonary embolism, iliofemoral deep vein thrombosis, and chronic thromboembolic pulmonary hypertension: a scientific statement from the American Heart Association. Circulation 2011;123:1788-830.
13. Wells PS, Rodger M. Diagnosis of pulmonary embolism: when is imaging needed? Clin Chest Med 2003; 24: 13-28.
14. Stein PD, Woodard PK, Weg JG, Wakefield TW, Tapson VF, Sostman HD, Sos TA, Quinn DA, Leeper KV Jr, Hull RD, Hales CA, Gottschalk A, Goodman LR, Fowler SE, Buckley JD; PIOPED II investigators. Diagnostic pathways in acute pulmonary embolism: recommendations of the PIOPED II investigators. Am J Med;2006 Dec;119(12):1048-55