ejpmr, 2018,5(8), 399-404

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

EVALUATION OF CLINICAL PROFILE AND DIAGNOSTIC METHODS IN ACUTE PULMONARY EMBOLISM, A PROSPECTIVE ONE YEAR STUDY IN A TERTIARY CARE HOSPITAL

Dr. Khwaja M. Mohsin[1]*, Dr. M. V. Kalasuramath[2], Dr. Ashwini S. Raju[3] and Dr. Arpitha J. S.[3]

[1]Associate Professor in Medicine SDM Medical College, Dharwad, Karnataka, India.
[2]Assistant Professor in Medicine SDM Medical College, Dharwad, Karnataka, India.
[3]House Surgeons, Dept of Medicine SDM Medical College, Dharwad, Karnataka, India.

***Corresponding Author: Dr. Khwaja M. Mohsin**

Associate Professor in Medicine SDM Medical College, Dharwad, Karnataka, India.

Article Received on 09/06/2018 **Article Revised on 29/06/2018** **Article Accepted on 19/07/2018**

ABSTRACT

Acute pulmonary embolism is a common and sometime fatal disease. This study was undertaken to evaluate clinical features and diagnostic methods in a tertiary care hospital. **Methods:** Assessment of clinical features and diagnostic methods in acute pulmonary embolism over one year period. **Results:** In our study majority were males, 52 in number and 12 were females. Majority of patients were aged less than 60yrs in both males and females. Dyspnea was the most common symptom seen in 71.88%[46] patients followed by others. Past history of DVT/PE was the most common risk factor seen in 31.25%[20] Among co morbid conditions hypertension was the common, seen in 28.13%[18] of patients. ECG abnormality was detected in 68.5 %[44] patients. Chest x-ray was abnormal in 18.75%[12] About 37.5%[24] of patients had venous Doppler findings suggestive of deep vein thrombosis. Echocardiography was abnormal in 75%[48] of patients. In CTPA commonest abnormality detected was segmental thrombus seen in 81.25%[52] followed by sub-segmental thrombus 50%[32] Sensitivity of ECG over CTPA was 51.56%. The sensitivity of echocardiography over CTPA was 75% making echocardiography an important non invasive diagnostic tool for not only diagnosis and also assessment of severity in Pulmonary embolism. **Conclusion:** Pulmonary embolism is often under-diagnosed entity. High index of suspicion is the key to early diagnosis and better outcome.

KEYWORDS: Pulmonary embolism, ECHO, CTPA.

INTRODUCTION

Pulmonary embolism is a common clinical disorder with average incidence of one case per thousand population in western population[1], It is responsible for 5-10% of all in hospital deaths.[2]

The approach to evaluation should be efficient while avoiding risk of unnecessary tests so that therapy is initiated promptly.[3] pulmonary embolism has wide variety of presenting features, ranging from no symptoms to shock or sudden death.[4]

About 10% of symptomatic Pulmonary embolism are fatal in first hour and hospital mortality can be reduced from 30% to 8% if treated correctly.[1,2]

Pulmonary embolism is present in 60-80% of deep vein thrombosis patients and more than half are asymptomatic.[5]

With the availability of spiral computed tomography, there is now increased recognition of this entity in India.

In our study we share our experience about clinical presentation and various diagnostic tools to unearth pulmonary embolism.

METHODOLOGY

About sixty four patients diagnosed to have pulmonary embolism [CTPA proven] were prospectively studied over one year [Jan 2017 to Dec 2017]. A detailed history, risk factors evaluation and clinical examination was done in all sixty four patients. All patients underwent routine blood investigations [complete blood count, renal and liver profile, arterial blood gas] and also D dimer, troponin and BNP. Other investigations done were chest x-ray, ECG and 2 D echo. venous Doppler was done where ever there was clinical evidence of venous thrombosis. Only CTPA proven cases were included in the study as it is more than 90% sensitive and specific.

A patient was diagnosed to have pulmonary embolism if there was filling defect in CTPA. Patients were diagnosed to have Massive PE, if they had evidence of hemodynamic compromise [systolic BP< 90mmhg] or it

involved main pulmonary vessels and Submassive if there was evidence of right ventricular dysfunction with no hemodynamic compromise.If patients had no features of either massive or submassive they were labeled as minor PE.

RESULTS

Table 1: Distribution of patients by Age and Gender.

Age groups	Male	%	Female	%	Total	%
<60yrs	47	90.38	9	75.00	56	87.50
60-70yrs	3	5.77	2	16.67	5	7.81
>=71yrs	2	3.85	1	8.33	3	4.69
Total	52	100.00	12	100.00	64	100.00
Mean age	56.35		58.33		56.72	
SD age	4.40		6.24		4.86	

In our study majority of patients were male 81.25%[52] and females were 18.75%[12]. Most of the patients were aged less than sixty years ie 56 patients[87.5%], Age between 60-70yr were 5 patients[7.8%] and more than 70yr were 3 [4.68%]. Mean age among males was 56.35yr and in females it was 58.33yrs.

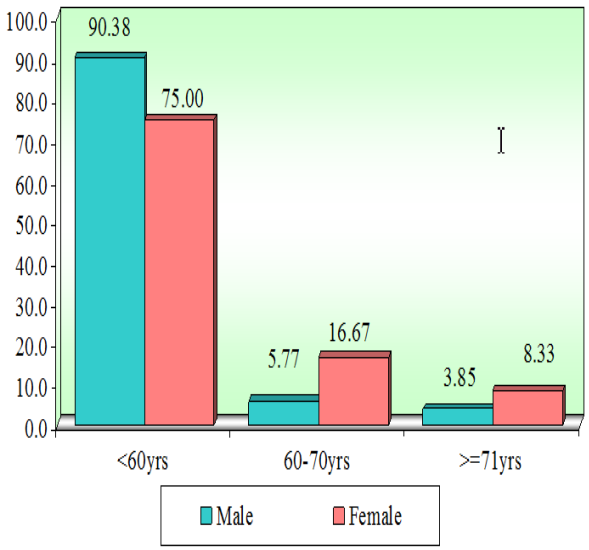

Fig 1: Percentage distribution based on patient's age and Gender.

Table 2: Distribution of patients based on symptoms.

Common symptoms	No of patients	% of patients
Cough	18	28.13
Chest pain	13	20.31
Dyspnea	46	71.88
Hemoptysis	6	9.38
Syncope	8	12.50
Others	24	37.50

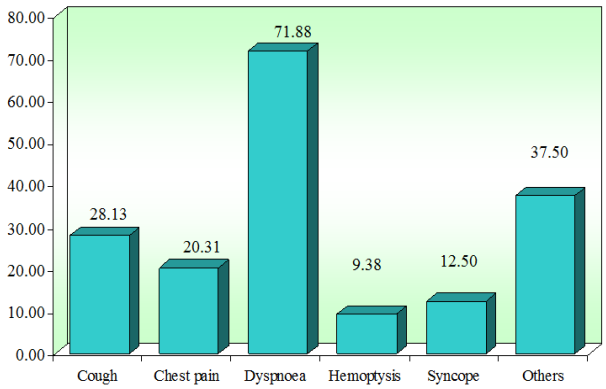

Fig 2: Percentage distribution of patients symptom wise.

Evaluation of symptomatology revealed dyspnea was the predominant symptom seen in 46 patients[71.88%]. Next was others 24[37.50%] which included fever, palpitation, limb swelling, abdominal pain etc followed by cough seen in 18 patients[28.13%]. Least common was hemoptysis seen in 6 patients[9.38 %]

Table 3: Distribution of patients by presence of risk factors.

Risk factors	No of patients	% of patients
Pregnancy	0	0.00
CVC catheter	1	1.56
Bed bound	10	15.63
Fracture	5	7.81
Surgery	4	6.25
Others	10	15.63
Past h/o DVT/PE	20	31.25

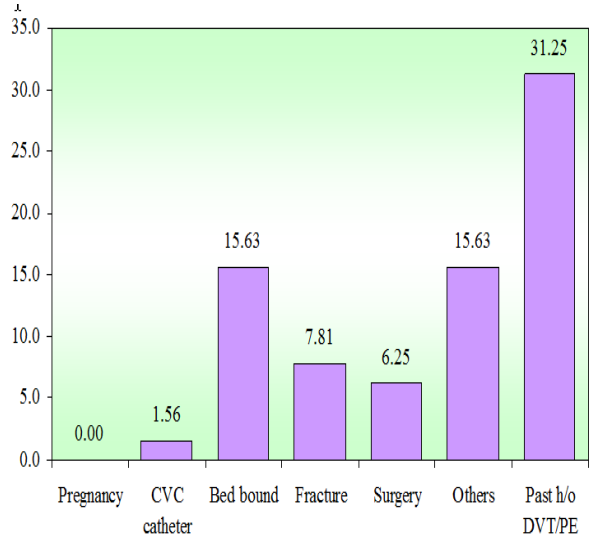

Fig 3: Percentage distribution of patients of various risk factors.

Among the risk factors analysis, past history of DVT/PE was the most important risk factor seen in 20 patients[31.25 %]. It was followed by bed bound state and others both were seen in 10 patient each [15.63 %].

Table 4: Distribution of patients by presence of co-morbid conditions.

Co-morbid conditions	No of patients	% of patients
Diabetic mellitus	14	21.88
Hypertension	18	28.13
Obesity	5	7.81
COPD	3	4.69
Stroke	3	4.69

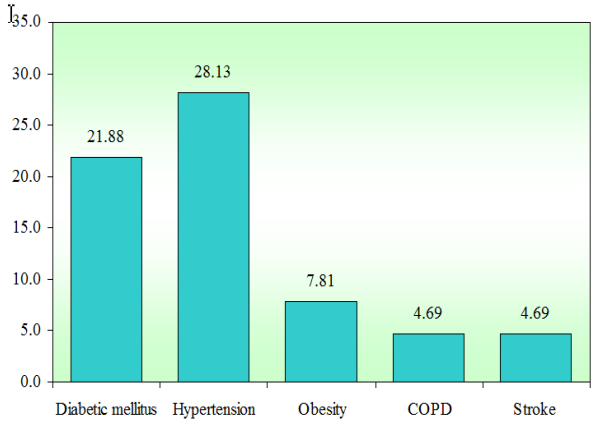

Fig 4: Percentage distribution of patients by presence of co morbid conditions.

Hypertension was found to be the most common co morbid condition seen in 18 patients[28.13], followed by diabetes mellitus 14[21.88%].

Table 5: Distribution of patients by presence of systemic signs.

Systemic signs	Findings	No of patients	% of patients
RS	Broncho spasm	2	3.13
	Crepitations	21	32.81
PA	Tender hepatomegaly	4	6.25
CNS	Conscious	63	101.56
	Drowsy	1	1.56
CVS	RVS3	2	3.13
	TR - Murmur	3	4.69

Among systemic signs, in respiratory system most common sign was crepitations seen in 21 patients[32.18%] and bronchospasm in 2 patients[3.13]. Tender hepatomegaly seen in 4 patients[6.25%], right ventricular third heart sound was heard in 2 patients and tricuspid regurgitation in 3 patients. Majority of patients were conscious [63 patients].

Table 6: Distribution of patients based on abnormal laboratory results.

Laboratory investigations	No of patients	% of patients
CBC	22	34.38
LFT	9	14.06
RFT	14	21.88
SOB - BNP	26	40.63
D Dimer	33	51.56
ABG - SPO2	22	34.38
PaO2	21	32.81

In laboratory evaluation complete blood count showed abnormality in 22 patients[34.28%], abnormal Liver function test and renal function tests in 9 patients[14.06%] and 14 patients[21.88%] respectively. Among specific investigations BNP was elevated in 26 patients[40.63 %], D-Dimer was positive in 33 patients[51.56%] and low saturation in pulse oximetry in 22 patients[34.38%].

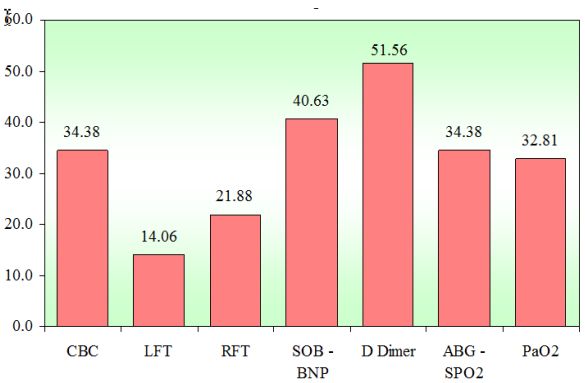

Fig 5: Percentage distribution of patientsbsed on abnormal lab results.

Table7: Distribution of patients by ECG findings.

ECG findings	No of patients	% of patients
S1Q3T3	24	37.50
RV strain	13	20.31
RT axis	5	7.81
RBBB	2	3.13

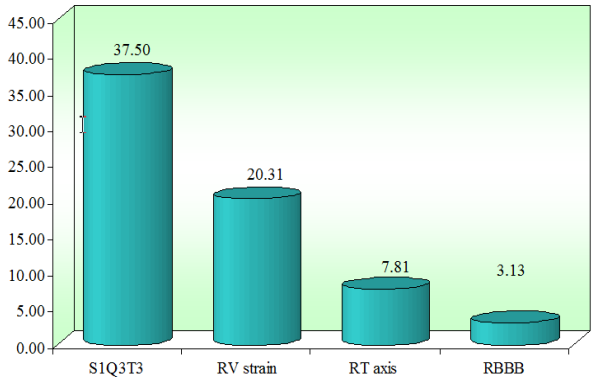

Fig 6: Percentage distribution of patients based on abnormal ECG.

ECG abnormality was seen in 44 patients[68.5%]. The most common finding was S1Q3T3 pattern which was seen in 24 patients[37.5%]. Which was followed by Right ventricular strain seen in 13 patients[20.31%]. Rt axis deviation and Rt bundle branch block seen in 5 patients and 2 patients respectively.

Table 8: Distribution of patients by Chest X-ray findings.

Chest X-ray findings	No of patients	% of patients
Opacity	6	9.38
Oligemia	1	1.56
Effusion	5	7.81

Chest x-ray was abnormal in 12 patients[18.75%], X ray opacity was seen in 6 patients, followed by effusion and lastly oligemia.

Table 8: Distribution of patients based on Venous Doppler findings.

	No of patients	% of patients
Venous Doppler (Abnormal)	24	37.50
Proximal	17	70.83
Distal	7	29.17

About 24 patients[37.5 %] were found to have evidence of Deep vein thrombosis. Seventeen of those patients had proximal DVT and seven had distal DVT.

Table 9: Distribution of patients by presence of CTPA findings.

	No of patients	% of patients
Saddle	4	6.25
Lobar	20	31.25
Segmental	52	81.25
Sub segment	32	50.00

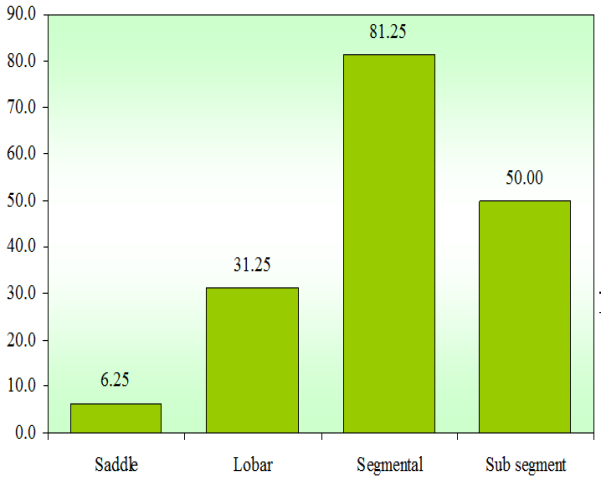

Fig 7: Percentage distribution of patients based on CTPA results.

In CTPA studies, major abnormality was seen in segmental artery 52 patients[81.25%], which was followed by sub segmental artery thrombus 32patients[50%]. Saddle thrombus was seen in 4 patients.

Table 10: Distribution of patients by Echo-Cardiography findings.

Echo Cardiography findings	No of patients	% of patients
Abnormal	48	75.00
Normal	16	25.00
Total	64	100.00

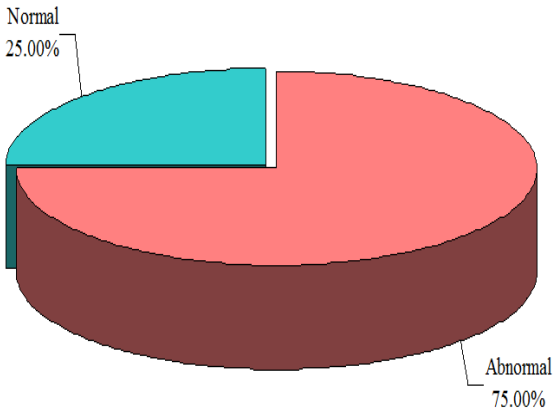

Fig 8: Patients distribution based on Echo findings.

Abnormal echo finding was seen in 48 patients[75%]. The most common echo finding was RV dilatation 38 patients[59.35] which was followed by pulmonary hypertension 33 patients[51.5%], Rt ventricular strain seen in 8 patients, Tricuspid regurgitation in 10 patients and thrombus in RV seen in one patient.

Table 11: Agreement between ECG over CTPA.

ECG	CTPA			
	Abnormal	**Normal**	**Total**	**%**
Abnormal	33	0	33	51.56
Normal	31	0	31	48.44
Total	64	0	64	100.00
%	100.00	0.00	100.00	

Table 14: Sensitivity and specificity of ECHO over CTPA.

Sensitivity	75.00
Specificity	-
Positive predictive value	100.00
Negative predictive value	-

DISCUSSION

Pulmonary embolism has varied clinical presentation and ECG, chest x-ray and arterial blood gases are not totally reliable in diagnosis as they lack specificity.[6]

Our study gave us an insight on the clinical features, risk factors and diagnostic tools in sixty four patients of confirmed acute pulmonary embolism by CTPA.

Clinical suspicion is of paramount importance of in guiding diagnostic tests. Unexplained dyspnea and chest pain are most frequent symptoms. Pleuritic pain suggests embolism located in distal pulmonary arterial system. Presence of one or more risk factors will lower the threshold for diagnostic evaluation

The mean age in our study was 56 yrs although Goldhaber et al[8] and Miniati et al[9] reported a much higher age. In our study past history of DVT was the most common risk factor but PIOPED study showed smoking was the commonest risk factor after eliminating cardio respiratory disease.[10] Dyspnea is the most common presentation as in other studies.[9,10]

About 81% had normal X ray similar to other studies, it also suggest that patient with predominant respiratory symptom with normal x ray may suggest possibility of acute PE.

Since origin of thrombus is mostly from deep veins of legs, Doppler study is useful investigation. Doppler is positive in 50% cases of proven PE.[12] In our study doppler was positive in 37.5% patients.

ECG in addition to clinical suspicion can help physician towards diagnosis. In our study 68.5% had ECG

Table 12: Sensitivity and specificity of ECG over CTPA.

Sensitivity	51.56
Specificity	-
Positive predictive value	100.00
Negative predictive value	-

Table13: Agreement between ECHO over CTPA.

ECHO	CTPA			
	Abnormal	**Normal**	**Total**	**%**
Abnormal	48	0	48	75.00
Normal	16	0	16	25.00
Total	64	0	64	100.00
%	100.00	0.00	100.00	

abnormality in the form of S1Q3T3 pattern, RV strain, Rt axis deviation and RBBB.

Abnormal echo was found in 75% of patients in our study, similar to study done by agarwal et al[11] suggesting it as an important tool in diagnosing PE.

Use of spiral CTPA is major advancement in the diagnosis of PE. The sensitivity and specificity of diagnosing PE of major vessels [main, lobar and segmental level] using CTPA is greater than 90% but decreases in isolated sub segmental thrombus[7]

CONCLUSION

Pulmonary embolism is an under-diagnosed entity in India. Widespread availability of spiral CT and nuclear imaging techniques will result in increased diagnosis. Early recognition and aggressive management will improve the outcome of a potentially fatal condition.

REFERENCES

1. Wells PS, Rodger M diagnosis of pulmonary embolism; when is imaging needed? Clin Chest Med., 2003; 24: 13-28.
2. Kearon C, Natural history of venous thromboembolism; Circulation, 2003; 107: I-22-30.
3. Smith SB, Geske JB, Maguire et al, early anticoagulation is associated with reduced mortality for acute pulmonary embolism, chest, 2010; 137: 1382.
4. PIOPED investigators, value of ventilation/perfusion scan in acute pulmonary embolism JAMA, 1990; 263: 2753.
5. Topson V F, acute pulmonary embolism NEJM mar 6, 2008; 35: 1037-1052.
6. Fedullo PF, Tapson VF, the evaluation of suspected pulmonary embolism NEJM, 2003; 349: 1247-1256.
7. Padley SPG, lungscintigraphyvsspiral CT in the assessment of pulmonary emboli, Br J radiol, 2002; 75: 5-8.
8. Acute pulmonary embolism, clinical outcome in international cooperative PE registry, smauel Z goldhaber, luigi Visnani.

9. Miniati M, Cenci C, Monti S, clinical presentation of acute PE, survey of 800 cases, PLos One, 2012; 7: e30891.
10. Stein PD, Beemath A, Matta F, weg JG et al, clinical characteristic of patients with acute PE, Data from PIOPED II, Am J Med., 2007; 120: 871-9.
11. Agarwal R, Gulati, M Mittal BR, Clinical profile, Diagnosis and management of patients with symptomatic pulmonary embolism. Ind J Chest dis Allied science, 2006; 48: 110-4.
12. Moses KM, Fedullo PF, Littlejohn JK, corwford R, Frequent asymptomatic PE in patients with DVT, JAMA, 1994; 223-225.