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RESEARCH ARTICLE

SILENT PULMONARY EMBOLISM: INCIDENCE AND RISK FACTORS IN INDIAN PATIENTS WITH LOWER LIMB DVT

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Abstract

Objective: The aim of our study is to evaluate the incidence of silent pulmonary embolism in Indian patients with lower limb deep venous thrombosis.

Materials and Methods: 44 patients with acute lower limb proximal DVT were prospectively studied with respect to various clinical factors. All patients had no respiratory symptoms and were submitted to CT pulmonary angiography for active investigation of Pulmonary Embolism.

Results: 33 out of 44 patients were found to have silent PE (75%). Higher incidence of silent PE found in older age, male sex, right side involvement and unprovoked DVT. Of these risk factors, Unprovoked DVT had statistically significant higher incidence for Silent PE than patients with provoked DVT 83.38% vs. 50% (P=0.0451).

Conclusion: Above data (75%) clearly shows that silent PE is very frequent in Indian patients with deep venous thrombosis. Unprovoked DVT was single most significant risk factor associated with silent PE. This very high incidence supports the need for screening and high levels of suspicion regarding this complication especially in those with proximal unprovoked DVT.

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Introduction:-

Pulmonary embolism (PE) with its associated mortality is the most devastating complication of Deep Venous Thrombosis (DVT).^{9,10} There are various studies which show that Silent Pulmonary Embolism (SPE) is associated with increased conversion to symptomatic Pulmonary Embolism and with increased fatality.^{8,9} Western literatures shows incidence of Silent PE from 50% to 80%.^{1,2,8,9} The aim of our study is to evaluate the incidence of silent pulmonary embolism in Indian patients with lower limb deep venous thrombosis and analyzes the potential risk factors in patients with silent PE.

Methodology:

This is prospective observational study done in Stanley medical college in patients reporting to vascular surgery department with acute lower limb DVT from Jan 2015- Dec 2016. Totally 44 patients with acute lower limb DVT were studied with respect to various clinical factors. Only those with Proximal DVT were included in the study (involvement of deep venous thrombosis from popliteal vein and above).^{5,6} All these patients had no symptoms (dyspnea, cough, pleuritic pain, haemoptysis, syncope) or signs (tachycardia, tachypnoea, hypotension, fall in

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oxygen saturation) suggestive of PE.^{2, 3, 4} These patients were submitted to CT pulmonary angiography for active detection of Pulmonary Embolism. All these patients were subjected to routine blood investigations, chest x-ray, ECG, echocardiogram, Ultra sonogram of Abdomen and Pelvis with appropriate hypercoagulable work up.

Results and Discussion:-

Incidence:-

Out of 44 patients with acute lower limb proximal DVT, 33 were found to have silent pulmonary embolism with incidence of 75%. Data clearly indicate that Silent PE is very frequent in these groups of Indian patients with lower limb DVT.

Age:

Table 1:- Age Group Involving Silent Pulmonary Embolism.

S.NO.	AGE GROUP	SILENT PULONARY EMBOLISM		INCIDENCE
		POSITIVE	NEGATIVE	
1	≤ 30 YEARS	11	2	81.81%
2	31 – 40 YEARS	11	3	72.72%
3	41- 50 YEARS	5	5	70.51%
4	51 – 60 YEARS	2	1	66.67%
5	> 60 YEARS	4	0	100%

All Patients (four) in age group of > 60years were found to be silent PE positive with incidence 100%. Youngest patient in this study was 15 years girl with thrombosis upto infrarenal inferior vena cava and oldest was 82 years female with left lower limb iliofemoral DVT.

Table 2:- Characteristics Features Of Silent Pe Patients

S.NO.	FEATURES	NUMBER (N-33)	PERCENTAGE
1.	MEAN AGE (15 – 82 YEARS)	39.69YEARS	-
2.	GENDER:		
	A) MALE	22	66.67%
	B) FEMALE	11	33.33%
3.	EXTENT OF DVT :		
	A) ILIOFEMORAL DVT	21	63.63%
	B) FEMOROPOPLITEAL	10	30.3%
	C) INFERIOR VENA CAVA	2	6.06%
4.	LIMB INVOLVED:		
	A) RIGHT SIDE	12	36.36%
	B) LEFT SIDE	18	54.54%
	C) BOTH SIDES	3	9.09%
5	UNPROVOKED DVT	27	81.81%
	PROVOKED DVT	6	18.81%

Gender:-

Male patients were majority in our study (22/33) constituting 66.67%. Male patients had higher incidence of Silent PE than female patients 78.57% vs. 68.75%.

Limb Involved:-

Overall prevalence of DVT is more on the left side constituting 55.56% of the cases. But incidence of Silent PE was found to be more on right side compared to left side (80% vs. 72%). In this study, 4 had bilateral DVT with incidence of 75% (3 out of 4).

Extent Of DVT:-

All the patients included in our study were proximal DVT patients. Of these, that involving iliofemoral segment had higher incidence of Silent PE than those involving femoropopliteal segment (84% vs. 62.5%). Out of three patients with inferior vena cava involvement, two were positive for silent PE (66.67%).

Provoked / Unprovoked Dvt:-**Table 3:-** Provoked / Unprovoked Dvt In Silent Pe.

S.NO.		SILENT PULMONARY EMBOLISM		INCIDENCE
		POSITIVE	NEGATIVE	
1	UNPROVOKED DVT	27	5	83.38%
2	PROVOKED DVT	6	6	50%

P – 0.0451(STATISTICALLY SIGNIFICANT)

Unprovoked DVT patients were the majority in this study (81.81%) and also they had significant higher incidence of Silent PE than patients with provoked DVT (83.38% vs. 50%).

Ct Pulmonary Angiography:-

Majority of patients had involvement of segmental pulmonary arteries constituting 84.8%. Also four patients in our study had involvement of one main pulmonary artery constituting 12% of patients but had no symptoms or signs.

Figure 1:- CT Pulmonary angiogram: Site marked with circle indicate the occluded segment of pulmonary artery:

A) Main Pulmonary B) Lobar C) Segmental Artery.



Those factors like blood investigations, X-ray, ECG and Echocardiography were not contributory for detecting Silent PE.

Table 4:- Incidence Of Silent Pe - Comparison

S.NO	AUTHOR / YEAR	NUMBER	INCIDENCE
1	KRUTMAN 2013 ⁸	38/52	72%
2	FUSTER 2014 ³	68/103	66%
3	JIMÉNEZ 2006 ⁶	28/91	31%

Incidence of Silent PE in Krutman et al⁸, Fuster et al³ and Jiménez et al⁶ studies were 72%, 66% and 31% respectively. Incidence in this present study was 75%. This clearly shows there is a high incidence of PE in Indian subset of population.

Conclusion:-

Above data (75%) clearly shows that silent PE is very frequent in Indian patients with deep venous thrombosis, with Proximal, Unprovoked DVT as significant risk factors. This very high incidence supports the need for screening and high levels of suspicion regarding this complication especially in those with proximal unprovoked DVT.

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