

A study of CT angiography for the evaluation of pulmonary embolism

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Abstract

Background: Ventilation-perfusion (V/Q) scintigraphy has been widely used as an initial diagnostic test for PE but is limited chiefly by the large percentage of indeterminate studies and the substantial number of patients with low-probability scans who in fact have PE. **Aims and Objectives:** To Study CT Angiography for the evaluation of pulmonary embolism. **Methodology:** After approval from institutional ethical committee this cross-sectional study was carried out in the department of Radio-Diagnosis during the one year period i.e. January 2017 to January 2018 in the patients suspected of Pulmonary Embolism and referred to the department of radiology were included into study after taking informed written consent. All the patients were undergone routine test including the CT Angiography of lung for the detection of pulmonary embolism those persons shown pulmonary embolism on CT angiography were included. During the one year period there were 32 patients with signs on CT angiography. All details of the patients like age, sex, risk factors etc. were noted. **Result:** the majority of the patients were in the age group of 40-50 i.e. 40.62%, followed by 50-60 21.87%, 30-40 were 15.62%, >60 were 12.50%, 20-30 were 9.37%. The majority of the patients were Male i.e. 59.38%, followed by Female i.e. 40.62%. The majority of the patients were having complains like Respiratory distress i.e. 92%, Chest pain - 81%, Hemoptysis -65%, Tachycardia-59%. As per the CT Angiography the location was Central -40.63% , followed by Lobar in 28.13%, Segmental -21.88%, Sub segmental -9.38%. The majority of the patients associated with risk factors like Immobility -82%, H/o Surgery -75%, H/o Trauma -68%, DVT-53%, Obesity (BMI >30) -49%, H/o Contraceptive use -39%, COPD-27%. **Conclusion:** It can be concluded from our study that the majority of the patients were in the age group of 50-60 the most common clinical features were Respiratory distress, Chest pain, Hemoptysis, Tachycardia etc. and the most common risk factors were Immobility, H/o Surgery , H/o Trauma, DVT, Obesity, Contraceptive use . **Key Word:** Pulmonary embolism (PE), Deep Venous Thrombosis (DVT), CT Angiography.

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INTRODUCTION

Ventilation-perfusion (V/Q) scintigraphy has been widely used as an initial diagnostic test for PE but is limited chiefly by the large percentage of indeterminate studies

and the substantial number of patients with low-probability scans who in fact have PE^{1,2}. The standard of reference, pulmonary angiography, has not been widely accepted³ despite its high accuracy and low morbidity and mortality^{4,6}. Thus, a noninvasive test with high sensitivity and specificity in the diagnosis of PE has long been sought. Recently, there has been considerable interest in the use of helical computed tomographic (CT) angiography to serve this purpose. The use of CT angiography to evaluate patients suspected of having acute PE was initially described by RemyJardin *et al*⁷ who reported a sensitivity of 100% and a specificity of 96%. Investigators from several subsequent studies reported similar success with this technique, particularly, to the level of segmental branches^{8,14}.

METHODOLOGY

After approval from institutional ethical committee this cross-sectional study was carried out in the department of Radio-Diagnosis during the one year period i.e. January 2017 to January 2018 in the patients suspected of Pulmonary Embolism and referred to the department of radio-Diagnosis were included into study after taking informed written consent. All the patients were undergone routine test including the CT Angiography of lung for the detection of pulmonary embolism those persons shown pulmonary embolism on CT angiography were included. During the one year period there were 32 patients with signs on CT angiography. All details of the patients like age, sex, risk factors etc. were noted.

RESULT

Table 1: Distribution of the patients as per the age

Age	No.	Percentage (%)
20-30	3	9.37
30-40	5	15.62
40-50	13	40.62
50-60	7	21.87
>60	4	12.50
Total	32	100.00

The majority of the patients were in the age group of 40-50 i.e. 40.62%, followed by 50-60 21.87%, 30-40 were 15.62%, >60 were 12.50%, 20-30 were 9.37%.

Table 2: Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Male	19	59.38
Female	13	40.62
Total	32	100.00

The majority of the patients were Male i.e. 59.38%, followed by Female i.e. 40.62%.

Table 3: Distribution of the patients as per the clinical features

Clinical features	No.	Percentage (%)
Respiratory distress	29	92%
Chest pain	26	81%
Hemoptysis	21	65%
Tachycardia	19	59%

The majority of the patients were having complains like Respiratory distress i.e. 92%, Chest pain 81%, Hemoptysis -65%, Tachycardia-59%

Table 4: Distribution of the patients as per the location of emboli on CT Angiography

Location	No.	Percentage (%)
Central	13	40.63
Lobar	9	28.13
Segmental	7	21.88
Sub segmental	3	9.38

As per the CT Angiography the location was Central - 40.63% , followed by Lobar in 28.13%, Segmental -21.88%, Sub segmental -9.38%.

Table 5: Distribution of the patients as per the associated factors

Risk Factors	No.	Percentage (%)
Immobility	26	82%
H/o Surgery	24	75%
H/o Trauma	22	68%
DVT	17	53%
Obesity (BMI >30)	16	49%
H/o Contraceptive use	12	39%
COPD	9	27%

The majority of the patients associated with risk factors like Immobility -82%, H/o Surgery -75%, H/o Trauma - 68%, DVT-53%, Obesity (BMI >30) -49%, H/o Contraceptive use -39%, COPD-27%.

DISCUSSION

The introduction of MDCT pulmonary angiography has considerably changed the approach to PE and is currently the diagnostic method of choice as it is available, rapid, sensitive and allows adequate visualization of the pulmonary arteries and clots up to at least the segmental level beside addition to its ability to exclude alternative diagnoses. In addition decision-making in suspected PE has changed with recent improvements in the technology available¹⁵. In our study we have found that the majority of the patients were in the age group of 40-50 i.e. 40.62%, followed by 50-60 21.87%, 30-40 were 15.62%, >60 were 12.50%, 20-30 were 9.37%. The majority of the patients were Male i.e. 59.38%, followed by Female i.e. 40.62%. The majority of the patients were having complains like Respiratory distress i.e. 92%, Chest pain-81%, Hemoptysis-65%, Tachycardia-59%. As per the CT Angiography the location was Central-40.63%, followed by Lobar in 28.13%, Segmental-21.88%, Sub segmental -9.38%. The majority of the patients associated with risk factors like Immobility -82%, H/o Surgery - 75%, H/o Trauma -68%, DVT-53%, Obesity (BMI >30) - 49%, H/o Contraceptive use -39%, COPD-27%. This was similar to Noha M. Attia *et al*¹⁶ they found Dyspnea and tachycardia were common clinical features and obesity, Immobility, Trauma, Surgery, Contraceptive use were some of the common risk factors of it.

CONCLUSION

It can be concluded from our study that the majority of the patients were in the age group of 50-60 the most common clinical features were Respiratory distress , Chest pain, Hemoptysis, Tachycardia etc. and the most common risk factors were Immobility, H/o Surgery , H/o Trauma , DVT, Obesity, Contraceptive use .

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