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Is CT Scan a Significant Mode of Investigation to Diagnose Carcinoma of the Pulmonary System

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Abstract: ***Pulmonary nodules are one of the common radiologic findings. Now a day these lesions are typically discovered incidentally. The simple chest radiography or computed tomography commonly called as CT is the modern tools where we find these lesions. The routine CT when carried out for some other reasons will incidentally find these lesions. The problem does not begin when the lesion is identified but instead it starts when the physicians must decide how to pursue an evaluation of a nodule once it has been identified. With the increased use of computed tomography, solitary pulmonary nodules or the multiple small nodules are identified more often because of the relatively higher resolution of this modality compared with that of radiography. In one study of CT screening for lung cancer in persons who smoke, 13 percent of patients had pulmonary nodules larger than 5 mm at baseline. Another study of full-body CT screening in adults demonstrated pulmonary nodules in 14.8 percent of all scans, although this included nodules smaller than 5 mm as well. Overall, the estimated prevalence of solitary pulmonary nodules in the literature ranges from 8 to 51 percent.***

Keywords: Pulmonary nodule, CT, Lung, Smoking, Screening.

1. Introduction

The differential diagnosis for pulmonary nodules includes benign and malignant causes. Diameter of 8 mm or more, “ground-glass” density, irregular borders, and doubling time between one month and one year suggest malignancy. The American College of Chest Physicians recently released guidelines for the evaluation of pulmonary nodules, based primarily on nodule size and patient risk factors for cancer. Algorithms for the evaluation of lesions smaller than 8 mm and those 8 mm or greater recommend different imaging follow-up regimens. Fluorodeoxyglucose–positron emission tomography commonly called as PET scan can be used to aid decision making when cancer pretest probability and imaging results are discordant. The PET scan identifies the over activity of the cells by checking the glucose intake which has been tagged to a radioactive isotope. Any patient with evidence of a nodule with notable growth during follow-up should undergo biopsy for identification. The rationale for closely monitoring an incidentally found pulmonary lesion is that detection and treatment of early lung cancer might lead to decreased morbidity and mortality.

The lesions can be solitary or multiple. Solitary pulmonary nodules are commonly isolated, spherical radiographic opacities that measure less than 3 cm in diameter and are surrounded by lung parenchyma.[1] Although commonly used, the term*coin lesion* is not recommended because it implies a flat structure.[2] Solitary pulmonary nodules may be found incidentally on imaging studies of the neck, upper extremities, thorax, and abdomen, and have been noted in roughly 0.09 to 0.2 percent of all chest radiographs.[3]

With the increased use of computed tomography, solitary pulmonary nodules or the multiple small nodules are identified more often because of the relatively higher resolution of this modality compared with that of radiography. In one study of CT screening for lung cancer in persons who smoke, 13 percent of patients had pulmonary nodules larger than 5 mm at baseline.[4] Another study of full-body CT screening in adults demonstrated pulmonary nodules in 14.8 percent of all scans, although this included nodules smaller than 5 mm as well.[5] Overall, the estimated prevalence of solitary pulmonary nodules in the literature ranges from 8 to 51 percent.[6,7]

Lung cancer screening is not recommended by the American College of Chest Physicians (ACCP) for the general population, nor for smokers, because it has not been shown to prevent mortality.[8]The rationale for closely monitoring an incidentally found lesion (much like the theoretic benefit of lung cancer screening) is that detection and treatment of early lung cancer might lead to better outcomes overall.[9]

2. Aims and Objectives

To understand and evaluate the pulmonary nodules identified by CT scan.

3. Materials and Methods

CT scan was done in Three Hundred Twentypatients who were identified to have lung nodules either by other mode of radiological studies or first time identified in a CT scan itself.

The study was conducted in Travancore Medical College, Kollam

The study was conducted from June 2011to May 2015.
The patients who had other risk factors associated or who had lesions larger than 8mm size were asked to undergo PET scan or histo-pathological study.

The PET scan or histo-pathological study confirmed cases were evaluated for the CT scan lesions and has been reported.

4. Results

Mean age of the study participants (n=320)

	Mean	*Std. Deviation*
age	51.11	11.739

Table 2: Test for Significance

Location	Benign		X^2 value	p value
	Present	Absent		
Right Lung Apex	8	48	12.988	0.005
Right Lung Base	6	217		
Left Lung Apex	1	27		
Left Lung Base	1	12		
Location	Malignant		X^2 value	p value
	Present	Absent		
Right Middle Lobe	7	49	8.920	0.030
Right Lung Apex	21	202		
Right Lung Base	8	20		
Left Lung Base	2	11		

5. Discussion

In a developing economy like ours it should be made mandatory to have a screening test and save as many lives as possible. To ensure that appropriate treatment is initiated in a timely way, the aim in evaluating pulmonary nodules is to correctly differentiate malignant and benign lesions. Clinical assessment of patients' risk factors for malignancy, including age, smoking history, and history of malignancy, is important. In India majority of the young population smokes and this is not going to show effects immediately but as the population begins to age it always turns out to be unnecessary avoidable burden. In terms of imaging evaluation, obtaining prior radiographs or chest CT images is useful to determine nodule growth. Further imaging evaluation, including CT enhancement studies and PET/CT, helps determine the malignant potential of solid pulmonary nodules. For solid nodules, CT enhancement of less than 15 HU and low or no glucose which has been tagged with radio- active isotope uptake at PET/CT suggest benignity.

6. Conclusion

This study shows the significance of CT in the diagnosis of this disease. The life-threatening diseases if diagnosed and evaluated early gives the physicians that extra precious time to respond to the needs of the patients and also in some cases to save the life of the patients.

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