ROLE OF HIGH RESOLUTION COMPUTED TOMOGRAPHIC SCAN IN DIAGNOSIS OF INTERSTITIAL LUNG DISEASES IN LOCAL POPULATION

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ABSTRACT

Objective: *The objective of this study was to find the role of High Resolution Computed Topographic (HRCT) scan of the chest in the diagnosis of Interstitial Lung Diseases (ILD) in our local population.*

Methodology: *A prospective study of fifty patients already diagnosed as ILD on transbronchial or open lung biopsy was performed in the Medical B Unit of the Department of Medicine Khyber Teaching Hospital, Peshawar from January, 2008 to December, 2008. Both male and female admitted patients above 15 years of age were included in this study.*

Results: *Of the fifty patients meeting the inclusive criteria 18 were male and 32 were female. The commonest affected age was 40-60 years. The commonest symptoms were shortness of breath and cough respectively. Inspiratory crepts and wheezes were the most common physical findings followed by clubbing, raised jugular venous pressure and edema feet. HRCT Scan revealed ILD in 88% with sensitivity of 95% and specificity of 75% having 95% positive predictive value and 75% negative predictive value.*

Conclusion: *HRCT Scan of chest is the most sensitive non invasive test in the diagnosis of ILD compared to chest X ray, pulomary fuction tests and can abate the need of lung biopsy in many cases.*

Key Words: *Interstitial lung disease, High resolution Computed Topographic Scan.*

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INTRODUCTION

Interstitial lung disease, is an umbrella diagnosis given to a varity of diffuse parenchymal lung diseases. It encompasses a plethora of parenchymal lung disorders with common functional characteristics such as restrictive physiology, impaired gas exchange and with variable degrees of pulmonary inflammation and fibrosis[1,2]. Interstitial lung disease affects between 31.5 and 26.1 per 100,000 American men and women respectively[3].

Diagnosis of ILD requires extensive investigation into the patient's symptoms, life style, work history, exposures, and medications forming the clinical context[4]. Two-thirds of ILD cases have no reported aetiology[5]. The remaining one-third may be associated with various environmental or occupational factors including cigarette smoking, aspiration, certain drugs, radiation therapy, cancer, and systemic diseases with lung involvement[6]. Exhaustive environmental and occupational exposure history is thus essential as it may lead to identification of a specific cause for ILD[7].

Chest radiograph (CXR) is an easily available, non invasive investigation but it show abnormalities only in 80% patients[8]. It may be normal during early in the course of the disease and unable to identify the specific etiology of ILD. It cannot be used as sole diagnostic investigation in such patients but is routinely used in the initial workup of ILD patients.

Pulmonary function testing (PFTs) should include a spirometry (with and without bronchodilator) and plethysmographic lung volumes. But PFTs cannot diagnose a specific ILD or distinguish between active lung inflammation versus fibrosis and are critically important in the

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objective assessment of respiratory symptoms as well as in comparing the differential diagnosis, grading the severity of disease, and monitoring[9].

High Resolution Computed Tomographic Scan (HRCT) should be considered a standard procedure as it is relatively new modality in our setup during the initial evaluation of almost all patients who are suspected to have ILD. It is more sensitive than the plain radiograph in identifying ILD (with sensitivity greater than 90%) and the image pattern of parenchymal abnormalities on HRCT often suggests a particular set of diagnostic possibilities[10].

High Resolution CT Scan is a relatively new radiologic diagnostic modality in Peshawar compare to conventional chest X ray. The purpose of this study was to find its role in diagnosis of ILD in our setting.

METHODOLOGY

This descriptive observational study consisted of 50 patients in Medical B Unit of Khyber Teaching Hospital (KTH), Peshawar admitted between January 2008 to December 2008. HRCT were performed at Department of Radiology of same hospital.

Patients already diagnosed as ILD based on lung biopsy were included in the study while patients with neuromusculoskeletal disorder were excluded from the study.

All patients fulfilling inclusion criteria were explained the purpose of the study. After informed consent they were included in study. Demographic characteristics were recorded.

After detailed history, examination, chest radiograph and PFTs, HRCT were performed.

Patients were managed along the standard guidelines. All data was entered in an objectively structured proforma.

Data collected was entered into SPSS version 16.0 for statistical analysis. Mean and Standard Deviation of age, frequency of sex, percentages/ ratios were calculated for all variables.

RESULT

In our study total of 50 patients were included, 32 were females and 18 were males. Four patients (8%) had age less than 20 years, 10 patients (20%) were between 21-40 years of age, 30 patients (60%) were between 41- 60 years of age while 6 patients (12%) had age more than 60 years (Table 1).

Shortness of breath, the most common symptom was found in 47 patients (94%). Cough

Table 1: Age group of patients

<20year	4 (8%)
21-40year	10 (20%)
41-60year	30(60%)
>60year	6(12%)

Figure 1: Presenting Symptoms and Signs

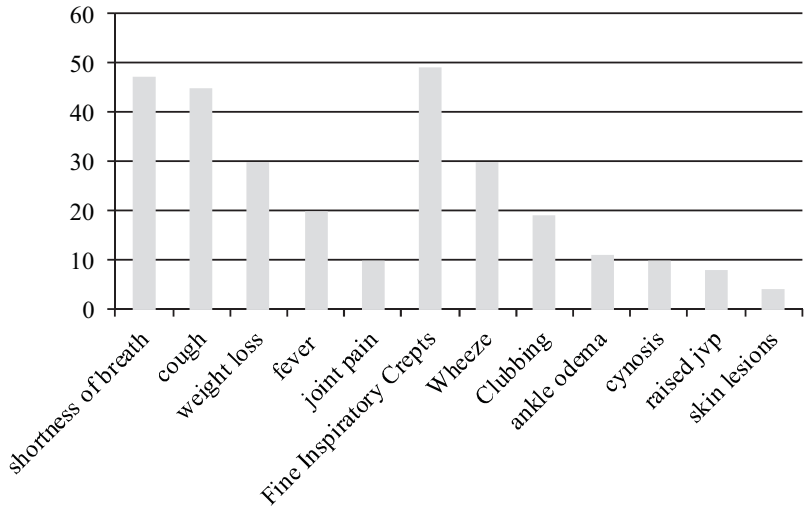

Table 2: Specificity and Sensitivity of HRCT in ILD

	ILD present	ILD absent
	True positive	False positive
HRCT	44 patients (88%)	2 patients (4%)
	False negative	True negative
	2 patients (4%)	6 patients (12%)

Sensitivity 95%
Specificity 75%
Positive predictive value 95%
Negative predictive value 75%

was the next most common presenting symptom in 45 patients (90%). Weight loss, fever and joint pains were found in 30 patients (60%), 20 patients (40%), 10 patients (20%) respectively (Figure 1).

Fine inspiratory crackles was the most common physical sign present in 49 patients (98%), wheeze in 30 patients (60%), finger clubbing in 19 patients (38%), ankle odema in 11 patients (22%) central cyanosis in 10 patients (20%), raised jugular venous pressure in 8 patients (16%) and skin lesions in 4 patients (8%) (Figure 1).

X-ray chest was abnormal showing fine fibrosis and reticular changes in middle and lower zones in 38 patients (76%). Restrictive pulmonary function test were found in 30 patients (60%), and normal PFT in 20 patients (40%).

HRCT Scan revealed ILD in 44 patients (88%) with sensitivity of 95% and specificity of 75% having 95% positive predictive value and 75% negative predictive value (Table 2).

DISCUSSION

A wide range of acute and chronic pulmonary disorders are capable of diffusely affecting the lung parenchyma and cause its distortion. These constitute a group of interstitial lung diseases (ILD)[11] also referred as Diffuse parenchymal lung disorders (DPLD) accounting for about 15% of respiratory clinical practice. ILD is defined as the presence of respiratory symptoms and/or diffuse infiltrates on chest radiographs, abnormal pulmonary function tests with evidence of restrictive ventilatory defect and/or impaired gas exchange and persistence of any of these findings for >3 months[12].

ILDs result from tissue injury and attempted repair in the lung in those people who are genetically predisposed, but how genetic factors determine the host/lung response is unknown.

In our study finger clubbing was observed in 56% patients matching 49 to 66% from study by Jonston ID, et al[13] and 50% by Vijayasekaran S, et al[14].

Fine basal Velcro like inspiratory crepts were heard in 98% patients in our study compared to 93% by Tukianian P, et al[15] and 90% by Vijayasekaran S, et al[14].

Central cyanosis and skin lesion were seen in 8% and 20% in our study 37% and 4% seen in Vijayasekaran S, et al[14].

X-ray chest was abnormal in 76% patients in our study matching 80% by a study by Padly S P, et al[16].

HRCT is more sensitive than PFTs or CXR in the evaluation of pleuropulmonary disease[17]. HRCT was suggestive of ILD in 88% of patients in our study compared to 94% by Padly SP, et al[16] and 72% by Sant SM et al[17].

CONCLUSION

HRCT Scan is the most sensitive non invasive test in the diagnosis of ILD as it can show evidence of ILD even when clinical examination and PFTs and CXR are initially normal. It should be made available to the clinician for early diagnosis and proper management of ILD patients in our local setup and in many cases diagnosis of ILD can be made without performing open lung or transbronchail biopsy on bases of HRCT.

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None Declared

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CONTRIBUTORS

GS conceived the idea and planned the study. SA, FU & SK did the data collection and analyzed the study. SR supervised the study. All the authors contributed significantly in the submitted manuscript.