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Role of HRCT Thorax in Interstitial Lung Disease (A Study of 100 Patients)

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Abstract: ***Introduction**: Interstitial lung diseases (ILDs) also called diffuse infiltrative lung diseases are heterogeneous groups of disorders that predominantly affect the lung interstitial and share similar clinical and radiological manifestations. They are characterized by alveolar, septal thickening, fibroblast proliferation and pulmonary fibrosis. (1) Patients with ILD most commonly present with shortness of breath with exertion, fatigue, weakness, loss of appetite, loss of weight, dry cough, and discomfort in the chest. These patients have a diffuse infiltrative pattern on chest X-ray. For their smoldering evolution and non-specificity of symptoms, they may remain undiagnosed and non-treated for a long time. Herein lies the importance of HRCT and other investigations in aiding an early diagnosis. In the diagnosis of interstitial lung diseases, clinical, radiological, and histological correlation is needed on most occasions. The chest radiogram remains the basic radiological tool in the investigation of these patients. However, chest radiography is relatively insensitive and is normal in 10-20% of patients with histologically proven interstitial lung disease. Many diseases remain occult or are not correctly diagnosed on chest X-rays. It is not specific also in that different interstitial lung diseases can have similar radiological appearances. With the advent of CT, Conventional 8-10 mm collimation scans allowed better assessment of lung parenchyma. However, CT only played a minor role in the diagnosis of interstitial lung diseases until the introduction of High-Resolution Computed Tomography (HRCT). By eliminating the superimposition of structures, HRCT allows for a better assessment of the type, distribution, and severity of parenchymal abnormalities. HRCT scanning with its greater ability to visualize fine. details within the lung have replaced conventional chest radiography as the preferred imaging method for the ILDs. HRCT has been found useful in the evaluation of ILDs in the following areas: Identification of the presence of disease (especially when chest x-ray or other studies are normal or equivocal), evaluation of the extent of disease, characterization of the patterns of the disease, narrowing the differential diagnosis, as a guide to the site of biopsy and assessing the clinical course of the disease and response to therapy. In this study we aim to assess the role of HRCT in the evaluation of interstitial lung disease, to accurately assess the pattern, distribution, and severity of the disease process for the purpose of treatment and management, to differentiate on HRCT reversible changes from those of irreversible which would determine the future prognosis in such patients and to assess the role of HRCT in predicting response to treatment. **Materials and Methods**: HRCT scan of 100 patients who fulfilled below mentioned inclusion criteria were analyzed and findings. of HRCT were correlated with relevant clinical history/investigations pertaining to patient's complaint and was evaluated for diagnosis from the case records/registers. The present study was conducted in the Department of Radio diagnosis and Imaging, at our hospital from December 2022 to December 2023. **Results**: In a study of 100 patients with suspected interstitial lung disease (ILD), HRCT scans revealed specific patterns. Most patients were in their 6th and 7th decades, with males more affected than females. Chronic breathlessness (82%) and cough (62%) were common symptoms. HRCT findings included septal thickening (87%), traction bronchiectasis (60%), honeycombing (58%), and ground glass opacity (49%). Lower lobes were predominantly affected (92%), with UIP being the most common subtype (45%). Smoking was a major risk factor, associated with various ILDs. HRCT outperformed X-rays in detecting abnormalities (76 vs. 26 patients). HRCT is crucial for diagnosing and managing ILD, offering superior detection of subtle changes and aiding in prognosis prediction. It helps confirm the type and extent of ILD, assess reversibility, predict prognosis based on fibrotic changes, and monitor disease progression and complications like infections and tumors. **Conclusion**: A single HRCT finding is often nonspecific, the combination of the various HRCT findings, together with their anatomical distribution, can suggest the specific type of ILD It can detect lesion even when the chest radiograph is normal. HRCT can confirm the location and extent of disease.***

Keywords: ILD, HRCT, Chest XRAY, Fibrosis

1. Introduction

Interstitial lung diseases (ILDs) also called as diffuse infiltrative lung diseases are heterogeneous group of disorders that predominantly affect the lung interstitial and share similar clinical and radiological manifestations. They are characterised by alveolar, septal thickening, fibroblast proliferation and pulmonary fibrosis. (1) Patients with ILD most commonly present with shortness of breath with exertion, fatigue, weakness, loss of appetite, loss of weight, dry cough, and discomfort in chest. These patients have a diffuse infiltrative pattern on chest X ray. For their smoldering evolution and non-specificity of symptoms, they may remain undiagnosed and non-treated for a long time. Herein lies the importance of HRCT and other investigations in aiding for an early diagnosis. In the diagnosis of interstitial lung diseases, clinical, radiological, and histological correlation is needed on most occasions. The chest radiogram

remains the basic radiological tool in the investigation of these patients. However, chest radiography is relatively insensitive and is normal in 10-20% of patients with histologically proven interstitial lung disease. Many diseases remain occult or are not correctly diagnosed on chest X ray. It is not specific also in that different interstitial lung diseases can have similar radiological appearances. With the advent of CT, Conventional 8-10 mm collimation scans allowed better assessment of lung parenchyma. However, CT only played minor role in diagnosis of interstitial lung diseases until the introduction of High-Resolution Computed Tomography (HRCT). By eliminating superimposition of structures, HRCT allows for a better assessment of the type, distribution, and severity of parenchymal abnormalities. HRCT scanning with its greater ability to visualize fine. details within the lung, has replaced conventional chest radiography as the preferred imaging method for the ILDs. HRCT has been found useful in the evaluation of ILDs in the following areas: Identification of the presence of disease (especially when chest x ray or other studies are normal or equivocal), evaluation of the extent of disease, characterization of the patterns of the disease, narrowing the differential diagnosis, as a guide to the site of biopsy and assessing the clinical course of the disease and response to therapy. In this study we aim to assess the role of HRCT in the evaluation of interstitial lung disease, to accurately assess the pattern, distribution, and severity of the disease process for the purpose of treatment and management, to differentiate on HRCT reversible changes from those of irreversible which would determine the future prognosis in such patients and to assess the role of HRCT in predicting response to treatment.

2. Aims and Objectives

The study aims to utilize high-resolution computed tomography (HRCT) to evaluate interstitial lung diseases (ILD) in symptomatic patients with normal or equivocal chest radiograph findings. It seeks to detect and analyses CT patterns, distribution, and severity of the disease process to inform treatment and management decisions. Furthermore, the study aims to differentiate between various ILD types based on CT findings, assess disease activity, and identify superimposed complications. It also aims to distinguish between reversible and irreversible changes on HRCT to determine future prognosis. Additionally, it seeks to evaluate HRCT's role in predicting treatment response by accurately assessing the pattern, distribution, and severity of the disease process.

3. Material and Methods

This observational (cross-sectional) study was conducted on 100 patients for one and half years from December 2022 to December 2023 in Department of Radiology in PDU Gov. Medical college and Civil hospital, Rajkot, Gujarat: after taking proper consent from them. The indication and details of the radiological procedure are explained to the patient. A written consent is obtained either from the patient or his/her relatives. Each patient had undergone HRCT as indicated. Findings of different imaging modalities are correlated with surgical & clinical outcomes whenever available. Sample size: 100, Study design: observational study, Type of study: retrospective, Duration of study: 1 year (December 2022 to December 2023), Place of study: PDU Medical College and Civil Hospital, Rajkot, Instruments used: GE Bright speed 16 slice.

Method of Collection of Data

The main source of data for the study were patients referred to the department of Radio diagnosis for HRCT.

Inclusion Criteria

The inclusion criteria encompass patients presenting with clinical symptoms such as breathlessness, dry cough, cough with expectoration, fever, joint pain, chest pain, fatigue, and weight loss and referred to radiology department for HRCT. Additionally, individuals with a history of multi-systemic diseases, particularly connective tissue disorders, accompanied by respiratory complaints are included. Patients with a documented history of occupational exposure, specifically to factors associated with interstitial lung disease, and reporting respiratory symptoms are also eligible for inclusion.

Equipment and Technique Used

High Resolution Computed Tomography imaging was performed on Dual source 16 slice computed tomography scanner. The patient was placed on gantry table in the supine position with both arms raised above the heads. He/she was taught prior to the procedure to hold breaths in deep inspiration and expiration wherever required.

HRCT

High-Resolution Computed Tomography (HRCT) is a specialized imaging technique that provides detailed cross-sectional images of the body, particularly focusing on the lungs. It utilizes thin slices and advanced computer processing to generate high-resolution images, offering superior visualization of lung structures compared to conventional CT scans. HRCT is invaluable in diagnosing and evaluating various lung conditions, including interstitial lung diseases, pulmonary fibrosis, lung nodules, and infections. Its ability to depict subtle abnormalities in lung tissue, such as ground-glass opacities, reticulations, and honeycombing, makes it an essential tool for diagnosis, treatment planning, and monitoring disease progression. Additionally, HRCT is preferred for assessing response to therapy and guiding interventions due to its excellent spatial resolution and multi-planar imaging capabilities.

Limitations

It is important to note that the present study has limitations. Firstly, it was conducted at a single center, which means that the results only provide an estimate of the epidemiology of Interstitial Lung Diseases (ILDs) in a single region of the country. Additionally, lung biopsy, which is considered the gold standard for the diagnosis of ILD, was not performed on any patient. This may have impacted the final diagnosis of specific ILDs in a few patients. Lastly, we did not study post-COVID patients, despite published reports of long-term fibrotic changes in these patients that resemble the more commonly described ILDs.

4. Literature Review

Computed tomography (CT), pioneered by Godfrey

Hounsfield in the early 1970s at EMI Laboratories in England and commonly known as CAT scan, has undergone significant advancements over its 25-year history, leading to improvements in speed, patient comfort, and resolution. The faster scanning times of CT scans allow for the scanning of more anatomy in less time, reducing artefacts caused by patient motion such as breathing or peristalsis, thus enhancing overall image quality. CT has revolutionized the assessment of lung pathologies by offering superior diagnostic accuracy and specificity compared to plain film radiography. The development of multi-detector CT (MD-CT) scanners, capable of rapid acquisition of thin slices and multiplanar reconstruction, has further enhanced the detailed investigation of lung diseases. However, the introduction of high-resolution CT (HRCT) has particularly enabled exceptional visualization of lung interstitial. Todo et al., in 1982, described the technique of HRCT for diffuse lung disease, emphasizing the correlation of abnormalities seen on HRCT images with corresponding inflation-fixed lung specimens. This pivotal study underscored the importance of interpreting HRCT findings with pathologic correlation, elucidating the relationship between abnormalities and the architecture of secondary pulmonary nodules. In a comparative study by Murata et al., axial HRCT scans with 1.5-mm collimation demonstrated superior visualization of small vessels and bronchi compared to 3-mm collimation, with greater contrast between vessels and lung parenchyma. Additionally, thin scans provided better resolution of subtle changes in lung attenuation associated with early interstitial lung disease or emphysema. Scadding's classification of pulmonary fibrosis in 1964 delineated two groups based on etiology and histopathology, emphasizing the complexity of interstitial lung diseases (ILDs). High- resolution algorithms are essential for optimizing HRCT image quality, as demonstrated by studies showing improved spatial resolution and subjective image quality. Remy et al. highlighted HRCT's superiority in detecting fine bronchial and parenchymal lesions compared to conventional CT, emphasizing its role in evaluating diffuse infiltrative lung disease (DILD) and assessing ground- glass attenuation. While conventional CT excelled in identifying micronodules and infiltrates, HRCT provided a comprehensive evaluation of DILD, particularly when assessing small parenchymal structures, underscoring its significance in clinical practice. A multidisciplinary approach is essential for accurately diagnosing and managing interstitial lung diseases (ILDs), involving collaboration between clinicians, radiologists, and pathologists. This dynamic process integrates clinical data, including patient presentation, exposures, lung function, and laboratory findings, with radiologic assessments to achieve a comprehensive diagnosis. Despite the importance of lung biopsy in certain scenarios, high-resolution computed tomography (HRCT) has emerged as a pivotal tool in ILD evaluation, revolutionizing diagnosis, prognosis, and treatment response prediction. Studies by Martin Remy Jardin et al. and Mathieson et al. underscore HRCT's superiority over conventional CT and chest radiography in diagnosing ILDs, with HRCT enabling confident identification of fine bronchial and parenchymal lesions, nodules, masses, and ground-glass opacities. Additionally, HRCT aids in predicting treatment response, as demonstrated by Wells et al., who found that the proportion of ground glass to reticular change influences treatment outcomes. Moreover, HRCT plays a crucial role in monitoring disease activity, as highlighted by Soler et al., who correlated nodular patterns on HRCT with active granulomas on histopathology. Furthermore, HRCT findings have contributed to defining new ILD entities, such as idiopathic pulmonary pleuro-parenchymal fibroelastosis (IPPFE), as illustrated by Frankel et al., demonstrating its complementary role to histopathology. Connective tissue diseases associated with ILDs present unique challenges in diagnosis. While past observations suggested a similarity to usual interstitial pneumonia (UIP), recent studies, including those by Lee et al., reveal that nonspecific interstitial pneumonia (NSIP) is the predominant pattern in connective tissue disease related ILDs, highlighting HRCT's role in pattern recognition. Occupational exposures, such as asbestos and silica dust, also manifest distinct HRCT features, facilitating accurate diagnosis, as observed by Denise R. Aberle et al. and D. Talini et al.

5. Results

In this study 100 patients with diagnosis of interstitial lung disease were observed. Of these 71 % were males while 29% were females.

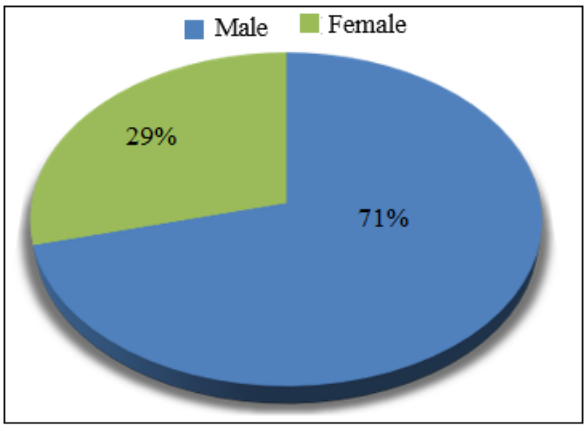

Figure 1: Sex distribution among cases

Table 1: Distribution of abnormal HRCT patterns according to Age and Sex of patients

Age (year)	Male	Female	Total	Percentage distribution according to age group
<20	3	1	4	4
21-30	1	2	3	3
31-40	7	5	12	12
41-50	10	2	12	12
51-60	15	5	20	20
61-70	22	10	32	32
71-80	10	2	12	12
>80	3	2	5	5
Total	71	29	100	100

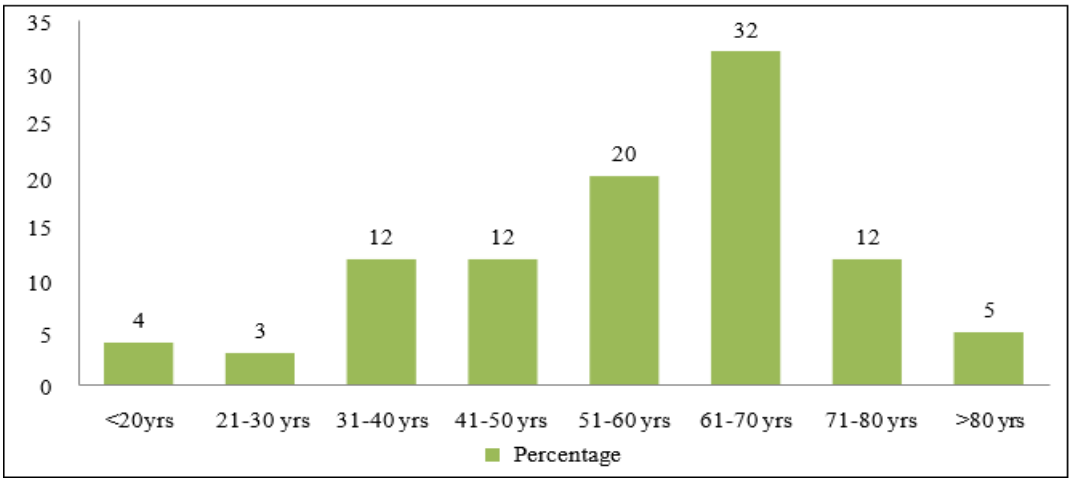

Figure 2: Percentage of ILD patients in different age groups

ILDs are most common in the age group of 61-70 years (32%) followed by 6th decade.

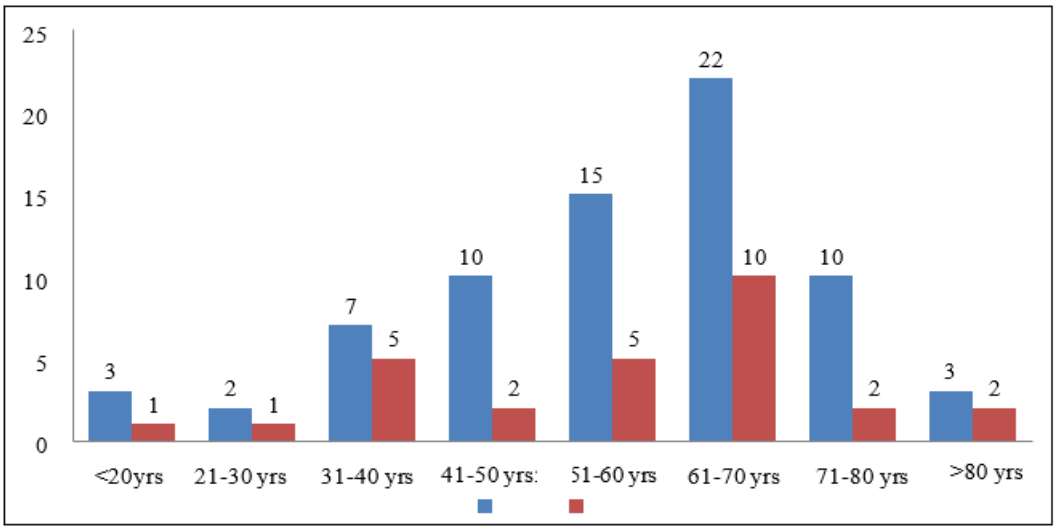

Figure 3: Distribution of male and female patients in specified age group

ILDs are more common in male patients in all age groups.

Table 2: Distribution of various symptom

S. No	Symptoms/Investigation	Percentage
1	Acute breathlessness	13
2	Chronic breathlessness	82
3	Chest pain	8
4	Cough	65
5	Hemoptysis	5
6	Clubbing	61
7	Symptoms associated with CVD (joint pain, stiff joints, dysphagia, etc)	5
8	Exposure history (>5 years)	15
9	Smoking history	61

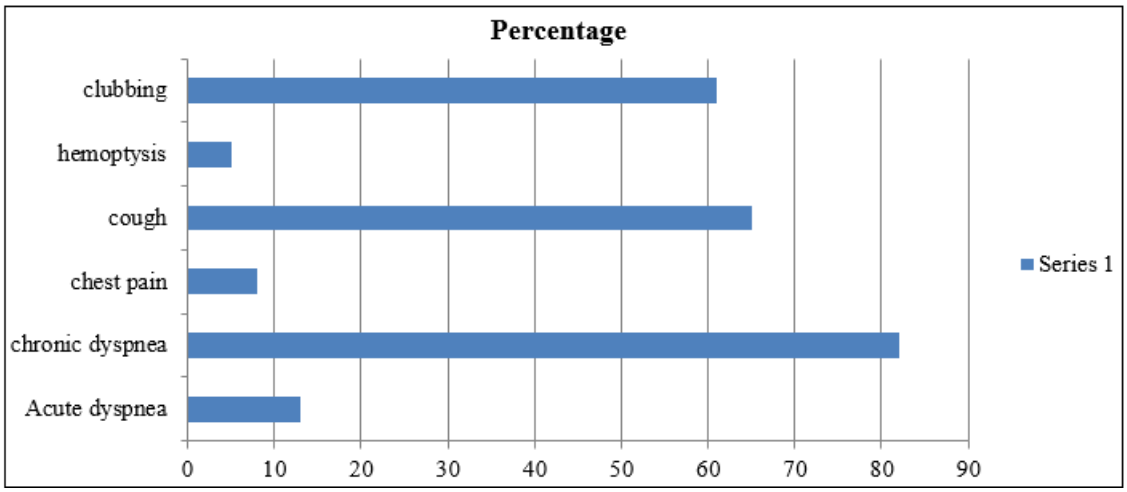

Figure 4: Distribution of symptoms among patients

The most common symptoms include chronic breathlessness (82%) followed by cough (65%) and the most common finding revealed on physical examination is clubbing in extremities (61%). Among associated factors, smoking is the most common factor accounting for about 61%.

Table 3: Comparison of Chest radiographs and HRCT in diagnosing ILDs

Abnormal chest radiographs	Abnormal HRCT patterns
76	100

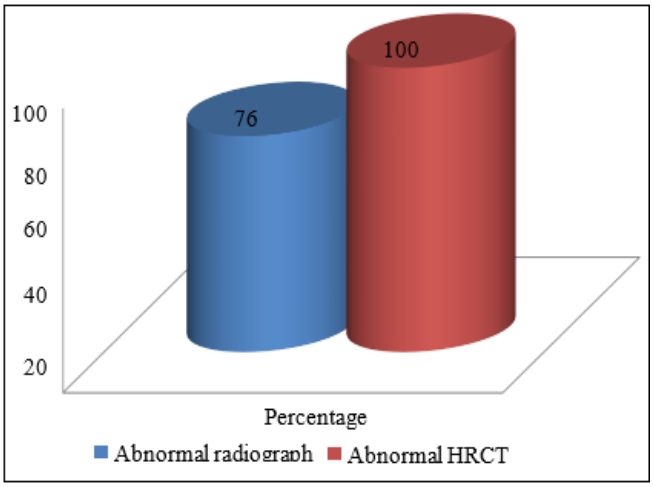

Figure 5: Percentage distribution of abnormal chest radiographs and HRCT

Among 100 patients with abnormal HRCT findings suggestive of ILDs, 76 patients had abnormal radiographs.

Table 4: Abnormal findings on HRCT

HRCT finding	Number of cases	Percentage
Interlobular septal thickening	87	87
Honeycombing	58	58
Perilymphatic nodules	11	11
Centrilobular nodules	11	11
Random nodules	13	13
Traction bronchiectasis	60	60
Ground glass opacity	49	49
Consolidation	11	11
Lung cysts	20	20
Mosaic attenuation	13	13
Fibrous bands	9	9
Emphysematous changes	31	31
Mediastinal lymphadenopathy	34	34
Changes of Pulmonary hypertension	3	3
Cardiomegaly	5	5
Pleural thickening	6	6

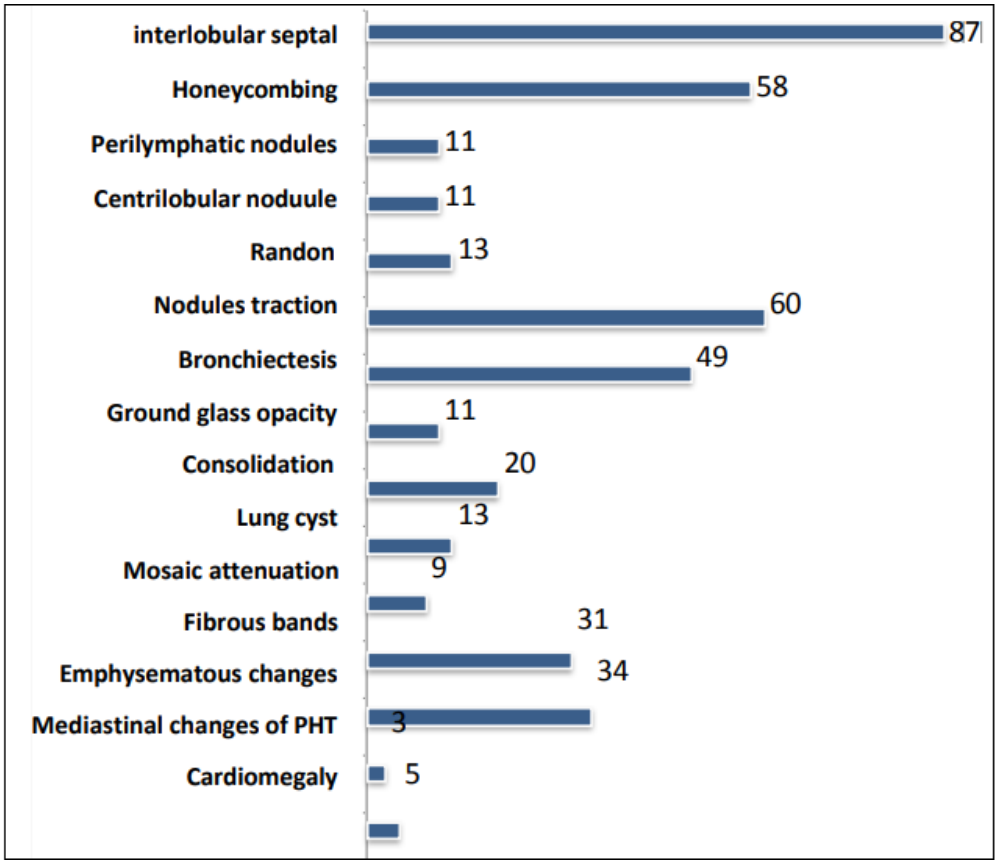

Figure 6: Distribution of various HRCT findings

Among the HRCT findings, the most common finding is the Interlobular septal thickening (87%), followed by traction bronchiectasis (60%), honeycombing (58%) and ground glass opacity (58%). Less common findings in accordance to ILDs include the nodules, consolidation and mosaic attenuation.

Table 5: Lobar predominance of HRCT findings

Lobe	Number of cases	Percentage
Upper lobes	61	61
Right middle lobe	56	56
Lower lobes	92	92

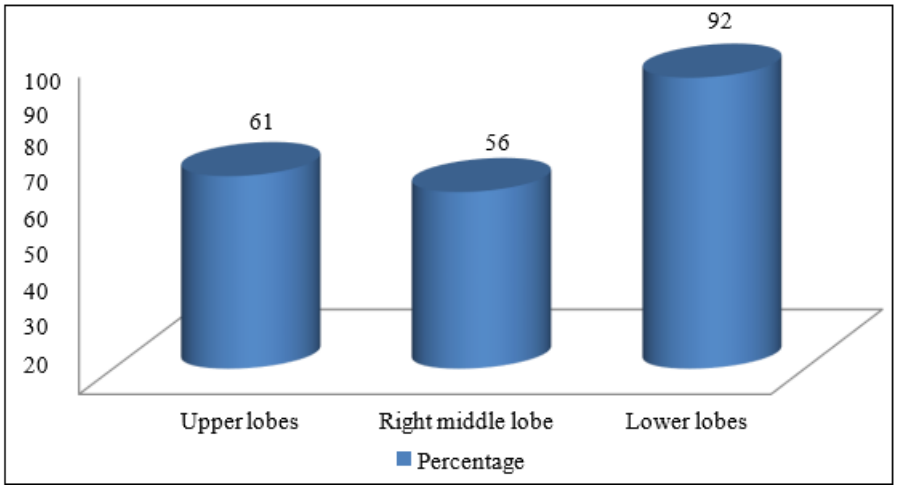

Figure 7: Percentage distribution of HRCT abnormalities in different lung lobes (Predominance)

The most common findings predominate in lower lobes (92%), Other lobes are relatively equally involved (50-61%).

Table 6: Zonal predominance of HRCT findings

Zone	No of cases	Percentage
Basal predominance	48	48
Apical predominance	6	6
Central predominance	7	7
Peripheral predominance	67	67
Subpleural sparing	8	8
Diffuse involvement	18	18

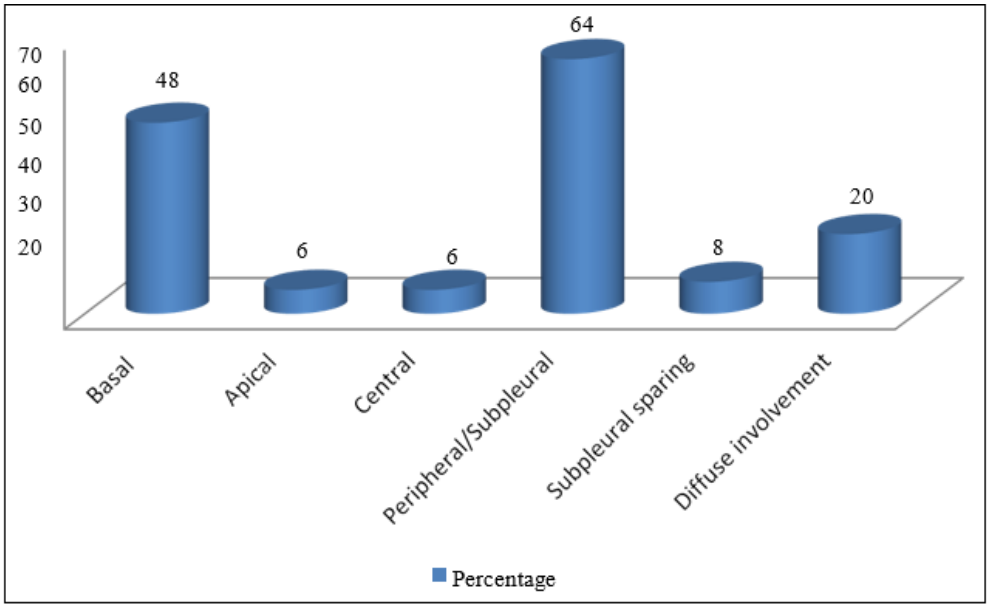

Figure 8: Percentage distribution of HRCT abnormalities in different lung zones (Predominance)

The changes predominantly involve the peripheral/sub pleural location (64%) followed by basal predominance (48%). Diffuse involvement of both lung fields is seen in 20% of patients. Apical predominance is seen in 6% of patients, predominantly in patients of Combined Pulmonary fibrosis and emphysema (CPFE).

Table 7: Distribution of ILDs based on HRCT patterns with reference to ATS 2013 classification

HRCT diagnosis		Number of cases	Percentage (%)
Idiopathic Interstitial Pneumonias (IIPs)	UIP	45	73
	CPFE	5	
	NSIP	15	
	DIP	2	
	RB-ILD	1	
	COP	4	
	LIP	1	
Collagen vascular disease associated ILDs	RA	1	4
	PSS	3	
Sarcoidosis		5	5
Hypersensitivity pneumonitis		5	5
Langerhans cell histiocytosis		2	2
Lymphangioleiomyomatosis		1	1
Unclassifiable		9	9
Pneumoconiosis		5	5

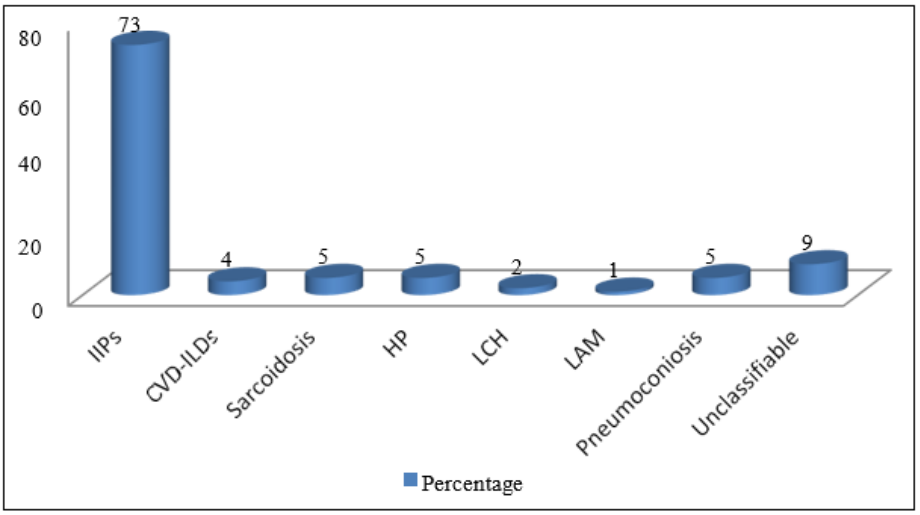

Figure 9: Percentage distribution of various ILD

In our study, the IIPs are the most common ILDs (73 %) followed by Unclassifiable (9 %). Collagen vascular disease-related ILDs (CVD-ILDs), Pneumoconiosis, sarcoidosis, and hypersensitivity pneumonitis (HP) are equally present in our study (4- 5%). Cystic ILDs such as Pulmonary Langerhans cell histiocytosis (LCH) and Lymphangioleiomyomatosis (LAM) are the least common ILDs (2%).

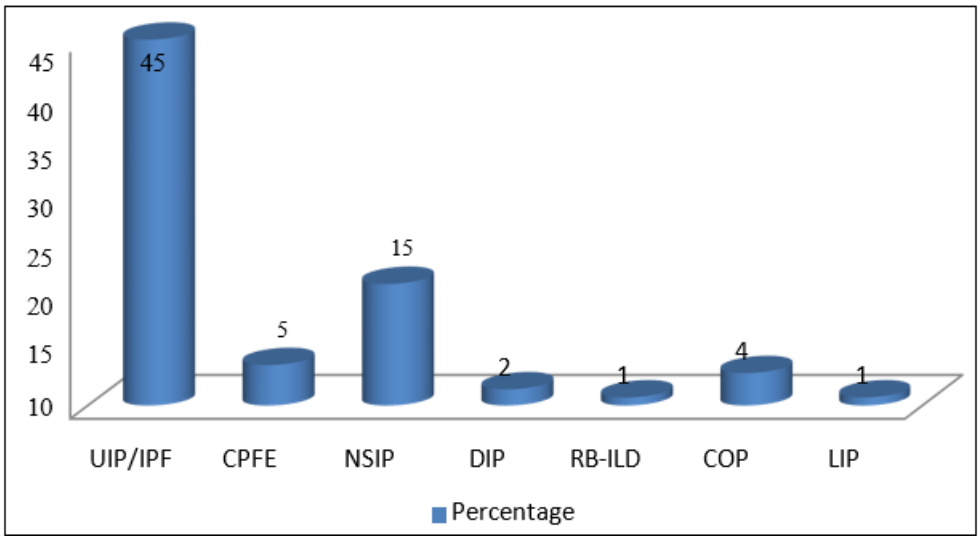

Figure 10: Percentage distribution of various IIPs

Among the IIPs, UIP is the most common pattern (45 %) followed by NSIP (15%) and CPFE (5 %). The least common patterns include the RB-ILD (1%).

Table 8: Relationship between smoking history and smoking related ILDs with reference to literature

Common smoking Related ILDs	Total no. of cases	Patients with smoking history		Patients without smoking history	
		No of cases	Percentage	No of cases	Percentage
RB-ILD	1	1	100	-	
DIP	2	2	100	-	
Pulmonary LCH	2	0	0	2	100
UIP	45	26	57	19	43
CPFE	5	4	80	1	20

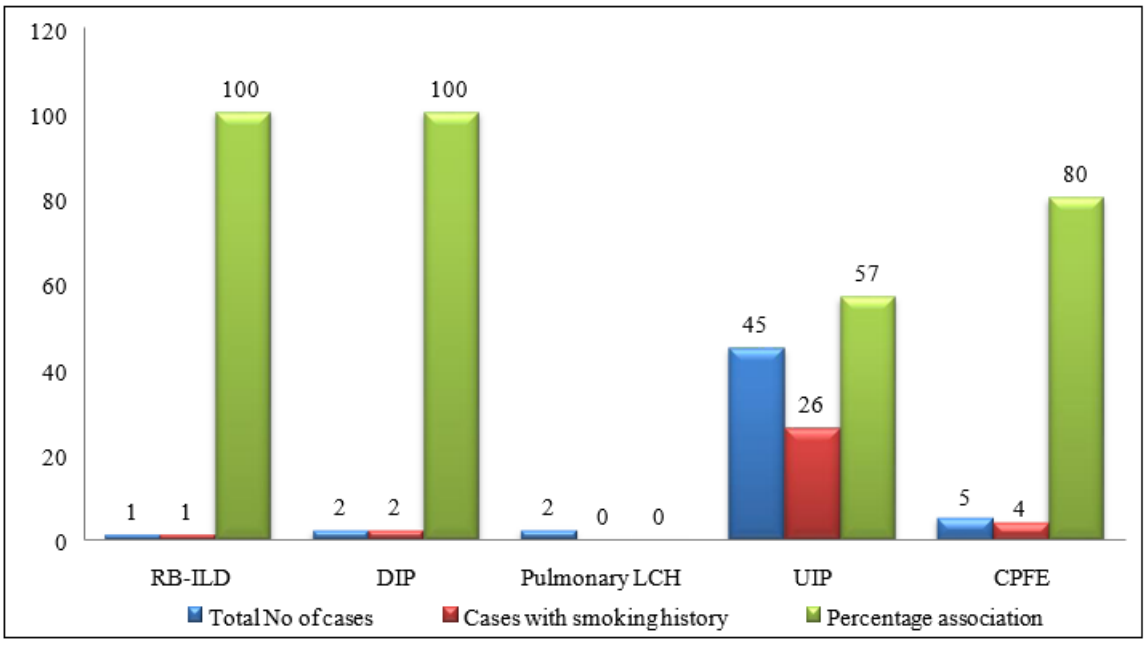

Figure 11: Association between smoking and smoking related ILDs

As per the literature, the most common smoking-related ILDs include RB-ILD, DIP, Pulmonary LCH, UIP and CPFE. We studied the relationship of smoking (30 pack years or more, current smoker), all cases of RB-ILD and DIP show an association with smoking, and 57 % of IPF patients and 80 % of CPFE show an association with smoking.

Table 9: Relationship between Subpleural sparing and NSIP pattern

Total NSIP cases	NSIP with Subpleural sparing	NSIP without subpleural sparing
15	10	5

In our study, subpleural sparing which is pathognomic for NSIP is seen only in 10 patients (66%) of NSIP, the rest of the patients do not show this finding yet other features suggestive of NSIP.

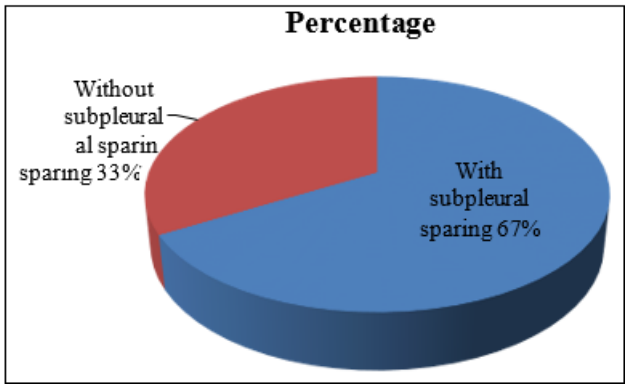

Figure 12: Percentage distribution of NSIP with and without subpleural sparing

Table 10: Pattern of ILD associated with Collagen vascular diseases

CVD	UIP	NSIP	Total no of patient
RA	1	-	1
PSS	1	2	3

Of total 4 patients with CVD related ILDs, Progressive systemic sclerosis (PSS) is the most common CVD in our study followed by Rheumatoid arthritis (RA). The most common ILD in PSS is NSIP in our study followed by UIP. In one patient with RA, ILD is found to be UI.

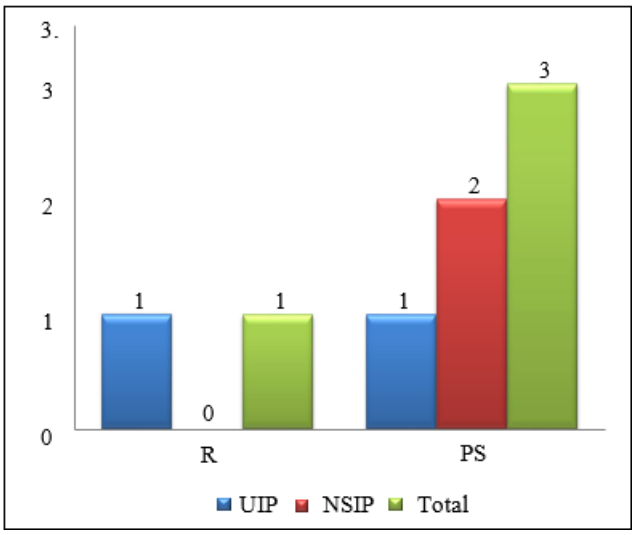

Figure 13: Relationship between CVD and predominant pattern of ILD

Table 11: Exposure history in relation to Pneumoconiosis

Exposure history	Pneumoconiosis	Other ILDs unrelated to exposures
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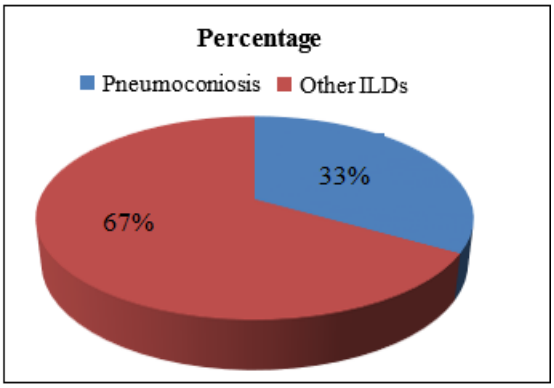

Figure 14: Exposure factors in association with ILDs

In our study, Pneumoconiosis is seen in 33 % of patients with specific exposure history (>5 years). The ILD patterns which do not have the findings of Pneumoconiosis are found in rest of the patients, most common being UIP. Among 5 patients with pneumoconiosis, 2 patients were diagnosed with asbestosis and 3 patients with silicosis (one with massive pulmonary fibrosis).

Table 12: Percentage distribution of patients with pneumoconiosis

Pneumoconiosis	Number of patients	Percentage (out of 100 patients)
Silicosis	3	3
Asbestosis	2	2

Table 13: Type of ILD in relation to predominant location and HRCT findings

HRCT diagnosis		Predominent Location	HRCT Findings
Idiopathic Interstitial Pneumonias (IIPs)	UIP (45)	Peripheral (96%) and basal	Honeycombing (100%)
	CPFE (5)	Apical lobe (100%)	Emphysema and interlobular septal thickening (100%)
	NSIP (15)	Lower lobes (93%)	Ground glass opacity (73%) and interstitial septal thickening
	COP (4)	Lower Lobes (50%)	Ground glass opacity and Consolidation (100%)
Sarcoidosis (5)		Right upper and middle and left lower lobe (100%)	Peri-lymphatic nodules (100%)
Hypersensitivity pneumonitis		Lower lobes	Ground glass opacities, and centrilobular nodules.
Unclassifiable (9)		Lower Lobe (100%)	Interlobular septal thickening (100%)

6. Conclusion and Summary

The study included 100 patients of different ages and both sexes with clinical findings suggesting of Interstitial lung disease who underwent HRCT from December 2022 to December 2023. In our study, we found that nearly half of the patients belonged to the 6th and 7th decades of life, indicating a prevalence of interstitial lung diseases (ILDs) in older individuals. Additionally, we observed a notable gender discrepancy, with males being more commonly affected than

females across all age groups, suggesting a potential gender predisposition to ILDs. Among the identified ILDs, chronic breathlessness (82%) emerged as the predominant symptom, affecting the majority of patients, followed by cough (62%). Among the HRCT findings, the most common finding is septal thickening (87%), followed by traction bronchiectasis (60%), honeycombing (58%) and ground glass opacity (49%). Less common findings in accordance with ILDs include nodules, consolidation, and mosaic attenuation. A study of 100 patients with interstitial lung disease (ILD) and fibrosis found specific patterns in their HRCT scans. The lower lobes were most affected (92%), with involvement primarily in the peripheral/subpleural regions (67%) and the bases (48%). Idiopathic interstitial pneumonias (IIPs) were the most frequent type (73%), followed by unclassifiable cases (9%). Among IIPs, usual interstitial pneumonia (UIP) was most common (45%), followed by nonspecific interstitial pneumonia (NSIP) (15%) and chronic hypersensitivity pneumonitis (CHPE) (5%). Smoking was the main risk factor, associated with all cases of respiratory bronchiolitis-ILD (RB-ILD) and desquamative interstitial pneumonia (DIP), 57% of UIP, and 80% of CHPE. Honeycombing was seen in all UIP patients (100%), while ground glass opacity was prevalent in NSIP (73%). Notably, subpleural sparing, a characteristic feature of NSIP, was present in only 66% of NSIP cases. Overall, HRCT was significantly better than conventional X-rays in identifying and diagnosing ILD and fibrosis, with abnormal findings on HRCT scans in 76 patients compared to only 76 with abnormal X-rays. HRCT is the go-to imaging technique for diagnosing and managing ILD due to its exceptional ability to detect minute changes in lung structure that might be missed by chest X-rays. By analyzing a combination of HRCT findings and their location, doctors can pinpoint the specific type of ILD, even in cases where chest X-rays appear normal. HRCT not only confirms the location and extent of the disease but also plays a central role in diagnosing and predicting the prognosis of Idiopathic Pulmonary Fibrosis, with the UIP pattern on HRCT being a key diagnostic criterion. HRCT offers a significant advantage over chest X-rays by enabling a confident diagnosis, thereby avoiding invasive lung biopsies in many patients. HRCT also provides valuable insights into reversible and irreversible changes in ILD patients. Reversible findings like ground glass opacities, centrilobular nodules, and consolidation can improve over time, whereas irreversible fibrotic changes like septal thickening, tractional bronchiectasis, and honeycombing indicate a poor prognosis. The extent of these irreversible changes can be used to predict disease severity and mortality in ILD patients. Furthermore, HRCT serves as a crucial tool for monitoring disease progression in ILD patients. Serial HRCT scans can reveal changes in honeycombing and reticulation, allowing for early identification of a more progressive and fibrosing disease course linked to poorer survival rates. HRCT's capability extends beyond just tracking the main disease progression; it can also detect other complications like infections, tumours, and acute exacerbations that may arise during the course of ILD.

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