Scholars Journal of Applied Medical Sciences (SJAMS)
Sch. J. App. Med. Sci., 2016; 4(3F):1086-1105
©Scholars Academic and Scientific Publisher
(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com

ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

DOI: 10.36347/sjams.2016.v04i03.090

Original Research Article

Study of Clinico radiological Profile and Treatment Modalities in Interstitial Lung Disease

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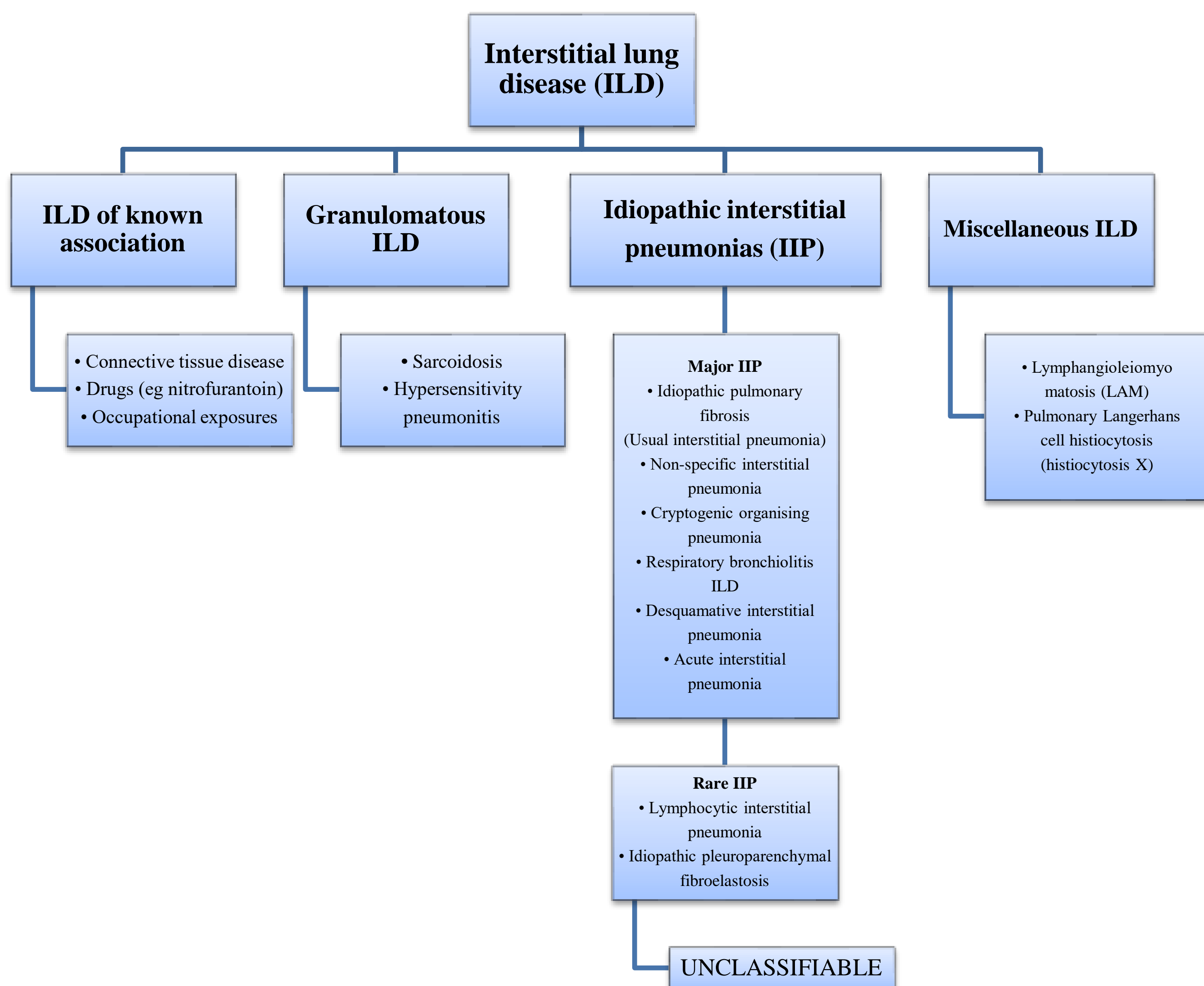
Abstract: The main objective is to study the clinical and radiological presentation of interstitial lung disease and also various type of treatment modalities used in intestinal lung disease. The method in present study was conducted on 50 diagnosed patients of interstitial lung diseases attending OPD/Indoor of Tuberculosis & Chest Department, Govt. medical college, Amritsar. In results & conclusion of the study group of 50 patients with interstitial lung disease, Sarcoidosis is the most common cause of ILD consists of 18 patients forming 36% of the study group. Average duration of symptoms in ILD patients in this study is 2.5 years. On an average age at presentation in the study group came out to be 48.8 yrs. Age distribution of the cases in the study group shows age group 40-60 yrs form 80% of patients consisting of 40 patients. In the present study of 50 patients, 27 are females (54%) & 23 are males (46%). Cough & Dyspnoea are the most common feature at presentation on our study group present in 45 (90%) & 40 patients (80%) respectively. Most common Chest X ray feature in our study group is reticular/ reticulo nodular opacity which was present in 41 patients (82%), followed by hilar lymphadenopathy in 10 patients (20%) and honey combing in 3 patients (6%).
Keywords: Interstitial lung disease, Sarcoidosis, Age, Symptom duration, Cough, Chest X-ray, CT scan etc

INTRODUCTION

Interstitial lung disease (ILD) is a heterogeneous group of disorders that are characterized by varying degrees of fibrosis and inflammation of lung parenchyma leading to restrictive pathology and common clinical, radiological, physiological and pathological manifestations [1]. Establishing an accurate diagnosis of ILD can be challenging for clinicians as there are more than 200 different subtypes. Patients with ILD often report progressive shortness of breath, exercise intolerance and a pervasive dry cough. Fine crepitations may be appreciated on chest auscultation. Signs of pulmonary hypertension and right heart failure may also be present, particularly in advanced disease. Oxygen denaturation commonly occurs during exertion and is associated with poorer long-term survival [2, 3].

Determination of the disease subtype requires consideration of the patient's history of exposures, specific clinical features, serology, and radiological pattern and, in some cases, lung biopsy during multidisciplinary discussions. Surgical lung biopsy carries an inherent risk of morbidity and mortality and only a fraction of patients are deemed suitable [4]. Over the past decade, ILDs have been reclassified in comprehensive international consensus statements [6-9]. The major subgroups of ILD (Figure) are broadly defined as:



Establishing an accurate ILD diagnosis is critical, as different disease subtypes carry distinct prognoses and require tailored management strategies. Baseline and more detailed investigations are shown in Table. A 'clinical–radiological–pathological' diagnosis is most accurately established within multidisciplinary discussion, where ILD physicians, radiologists and pathologists collaborate dynamically. The multidisciplinary discussion is considered the gold standard for determining a diagnosis of ILD minimises observer bias and enhances diagnostic confidence [5, 6].

The idiopathic interstitial pneumonias (IIPs) are a heterogeneous group of non neoplastic disorders resulting from damage to the lung parenchyma by varying patterns of inflammation and fibrosis [10]. The interstitium includes the space between the epithelial and endothelial basement membranes and it is the primary site of injury in the IIPs. However, these disorders frequently affect not only the interstitium, but also the airspaces, peripheral airways, and vessels along with their respective epithelial and endothelial linings[11]. Idiopathic indicates unknown cause and interstitial pneumonia refers to involvement of the lung parenchyma by varying combinations of fibrosis and inflammation, in contrast to airspace disease typically seen in bacterial pneumonia.

Idiopathic Pulmonary Fibrosis (IPF) is the most common type of idiopathic interstitial pneumonia forming 50-60% of cases [12]. The prognosis is usually worse compared with other IIPs, with a median survival time of 2 to 3 years [7]. IPF is characterized by the radiological pattern of usual interstitial pneumonia (UIP). HRCT with features of definite UIP in patient with clinical evidences not suggestive of alternative diagnosis is sufficient for a confident diagnosis of IPF and carries an accuracy of 80% to 90% [7, 13]. Biopsy is usually reserved for atypical or uncertain cases [14,

15]. The chest radiograph is normal in most patients with early disease. In advanced disease, the chest radiograph shows decreased lung volumes and sub pleural reticular opacities that increase from the apex to the bases of the lungs [16]. This apico-basal gradient is even better seen on high-resolution CT images. Together with sub pleural reticular opacities and macrocystic honeycombing combined with traction bronchiectasis, the apicobasal gradient represents a trio of signs that is highly suggestive of UIP [17, 18]. Ground glass abnormality is minimal or absent, never being the predominant pattern. Many patients with IPF may show atypical pattern of UIP on HRCT, with overlapping features of nonspecific interstitial pneumonia (NSIP), chronic HP, or sarcoidosis; in these patients open lung biopsy is usually necessary to establish a confident diagnosis [19]. The incidence of the disease increases with older age, with presentation typically occurring in the sixth and seventh decades [20, 21, 22]. IPF should be considered in all adult patients with unexplained chronic exertional dyspnea, and commonly presents with cough, bibasilar inspiratory crackles, and finger clubbing [23, 24, 25]. More men have been reported with IPF than women, and the majority of patients have a history of cigarette smoking [26], Exposure, medication, or systemic disease.

Table 1: Interstitial lung disease investigations

Interstitial lung disease investigation		
	Investigation	Possible findings
Routine at baseline and follow up	• Chest X-ray	• Non-specific infiltrates
	• HRCT scan	• Nodules • Cysts • Ground glass change • Honeycomb change • Traction bronchiectasis • Intralobular septal thickening
	• Pulse oximetry/ arterial blood gas	• Low SpO2, Low PaO2
	• Connective tissue disease serology	• Positive auto antibodies (eg ANA, ENA, RF, myositis antibodies, ANCA)
	• Lung function tests (spirometry, lung volumes, DLCO)	• Low FEV1, FVC • Normal or high FEV1/FVC ratio • Reduced lung volumes • Reduced DLCO
	• 6-minute walk test	• Reduced walk distance • Oxygen desaturation
Occasional	• Bronchoscopy with lavage	• Variable, frequently normal • May have elevated neutrophils, eosinophils and/or lymphocytes
	• Surgical lung biopsy	• Variable and specific for diagnosis
	• Echocardiogram	• Pulmonary hypertension • Right ventricular dysfunction
	• Right heart catheter	• Confirmation of pulmonary hypertension
	• Overnight sleep study	• Nocturnal hypoxia • Obstructive sleep apnoea

NSIP is less common than UIP but is still one of the most common histologic findings in patients with IIPs [27] typical patient with NSIP is between 40 and 50 years old and is usually about a decade younger than the patient with IPF. Symptoms of NSIP are similar to those of IPF but usually milder. Although it is primarily defined as an idiopathic disease, the morphologic pattern of NSIP is encountered in association with frequent disorders, such as connective tissue diseases, hypersensitivity pneumonitis, or drug exposure [28, 29]. In patients with early NSIP, the chest radiograph is normal. In advanced disease, bilateral pulmonary infiltrates are the most salient abnormality. The lower lung lobes are more frequently involved, but an obvious apicobasal gradient, as seen in UIP, is usually missing. High-resolution CT typically reveals a sub pleural and rather symmetric distribution of lung abnormalities. The most common manifestation consists of patchy ground-glass opacities combined with irregular linear or reticular opacities and scattered micro nodules [30-32]. In advanced disease, traction bronchiectasis and consolidation can be seen; Owing to the substantial overlap of high-resolution CT patterns, the major CT differential diagnosis for NSIP is UIP. The key CT features that favor the diagnosis of NSIP over UIP are homogeneous lung involvement without an obvious apicobasal gradient, extensive ground-glass abnormalities, a finer reticular pattern, and micro nodules [33-35].

Cryptogenic organizing pneumonia (COP), previously known as bronchiolitis obliterans organizing pneumonia is the idiopathic form of organizing pneumonia. On HRCT, the two most frequently seen features include bilateral, multifocal, patchy consolidation (present in upto 90% of cases) and ground glass abnormality [36]. The lung volumes are generally preserved, COP tends to preferentially involve the sub pleural and bronchovascular regions of the lung parenchyma [37].

Respiratory bronchiolitis (RB)-ILD is a part of the spectrum of smoking related lung diseases. The predominant finding on HRCT is ground-glass abnormality and preferentially involves the upper lobes. The ground glass abnormality of RB-ILD has been shown to represent areas of macrophage accumulation in the distal airspaces [38].

DIP (desquamative interstitial pneumonia) is a rare form of ILD. The usual age of presentation is 40-50 years, with men affected more than women (male/female >2:1). The disease predominantly affects smokers (90%) cases, but can also be seen secondary to lung infections, organic dust exposure, and marijuana smoke inhalation. HRCT typically shows a ground glass pattern, which is caused by diffuse macrophage infiltration of the alveoli along with interstitial septal thickening; this is generally present in all cases of DIP [42]. The ground glass pattern can either be patchy or diffuse, with a predilection for peripheral and basal lung zones [40].

Acute interstitial pneumonia (AIP) is notable for its acute presentation. On HRCT, the most common finding includes ground glass abnormalities, traction bronchiectasis, and architectural distortion. The ground glass pattern is patchy in most cases, with areas of lobular sparing; however some cases may show a more diffuse distribution [41].

ILDs can be associated with various occupational lung diseases (e.g. asbestosis, silicosis, coal worker pneumoconiosis, HP, berylliosis) [30, 31] and connective tissue disorders (e.g. rheumatoid arthritis, systemic sclerosis, systemic lupus erythematosus, mixed connective tissue disease).

Interstitial lung diseases of some specific type also show gender as well as age predilection in their prevalence. As women are more likely to have collagen vascular associated interstitial lung diseases due to increased risk of autoimmune diseases. Women are also almost exclusively affected by lymphangioleio myomatosis and tuberous sclerosis-associated lung diseases [33]. Particular ancestory also increases the likelihood of some interstitial lung diseases. Sarcoidosis occurs 10-to 12-fold more in blacks than in their white counterparts [42].

Patients with ILD frequently present with exertional dyspnoea which has been shown to be closely related to quality of life [34-36]. The mechanisms through which ILD produces dyspnoea include ventilation perfusion de-arrangements, diffusion impairment, neuro-mechanical dissociation, physiological restriction (due to reduced compliance and decreased elastic recoil), circulatory and cardiovascular limitation, anxiety and depression as well as skeletal and ventilatory muscle weakness [44].

The optimal therapy for interstitial lung diseases is an area of intense investigation. Current medical regimens have not shown to improve survival but nevertheless are routinely prescribed with hope of slowing of progression of disease. Immunosuppressive anti-inflammatory agents are used to treat various forms of ILD [45, 46]. There is reasonably compelling evidence that the administration of agents such as corticosteroids is strongly associated with improvement or even clearing of lung pathology for many forms of ILD. This is particularly the case for disorders such as cryptogenic organizing pneumonia (COP), eosinophilic pneumonia, sarcoidosis, or cellular non-specific interstitial pneumonia (NSIP) [45]. Traditional therapies that were suggested to benefit patients with IPF included corticosteroids and cytotoxic drugs (e.g. azathioprine, cyclophosphamide) [47].

Regarding the role of anti fibrotic therapy in patients with interstitial lung disease, Following evaluation in Phase II and Phase III clinical trials in patients with IPF, [48-50] pirfenidone was approved by the European Commission in February 2011. Pirfenidone is indicated for the treatment of patients with mild-to-moderate IPF.

AIMS AND OBJECTIVES

- To study the clinical features of interstitial lung disease.
- To study the radiological presentation of interstitial lung disease.
- To study the treatment modalities in interstitial lung disease.

MATERIALS AND METHODS

The present study was carried out on patients who were attending the outpatient department and/or admitted in Tuberculosis & Chest Department, Govt. Medical College, Amritsar, after taking approval from the ethical committee.

Study was conducted on 50 diagnosed patients of interstitial lung diseases attending OPD/Indoor of Tuberculosis & Chest Department, Govt. medical

college, Amritsar after taking approval from ethical committee and informed consent from patient.

Inclusion criteria

Diagnosed case of interstitial lung disease

Exclusion criteria

1) Patient not willing to give consent
2) Age less than 12 years
3) Pregnant ladies
4) Patients with obstructive lung disease such as COPD or asthma or active coronary disease or other co-morbid illness precluding performance of 6 min walk test.

Descriptive type of study of patients diagnosed as ILDs was done. Patient diagnosed as ILD based on clinical, radiological and PFT findings will be included in the study. Each patient was explained the purpose of the study and need for complete co-operation emphasized. Those who satisfied the inclusion and exclusion criteria were interviewed according to prepared pro forma. Interview was conducted in a well lit and ventilated examination room.

Detailed clinical history, physical examination, routine investigations (Hemoglobin, total leucocyte count, differential leucocyte count, erythrocyte sedimentation rate, random blood sugar, renal function tests, liver function tests), sputum examinations (for acid fast bacilli, malignant cells), chest radiography, HRCT, PFT, ECG, investigations for connective tissue diseases according to patient's clinical profile, and 6 minute walk test was done on all the patients.

ECHO and related other cardiac investigations were done for selected patients, as and when required. Treatment details were also noted.

OBSERVATIONS & RESULTS

Fifty patients diagnosed as ILD based on clinical, radiological and PFT findings attending OPD and/or admitted in Chest and TB hospital, Amritsar were included in the study. They were studied according to their demographic features, clinical characteristics, Radiological findings and treatment modalities and the following observations were made which have been depicted in tabular form.

Aetiology of Interstitial Lung Disease:

Table 1: Aetiology Distribution of Patients with Interstitial Lung Disease

	Total (N)	Sarcoidosis (N)	IPF (N)	NSIP (N)	HSP (N)	RA-ILD (N)	SS-ILD (N)	SLE (N)	LIP (N)	DIP (N)
Number of subjects	50	18	13	12	2	1	1	1	1	1

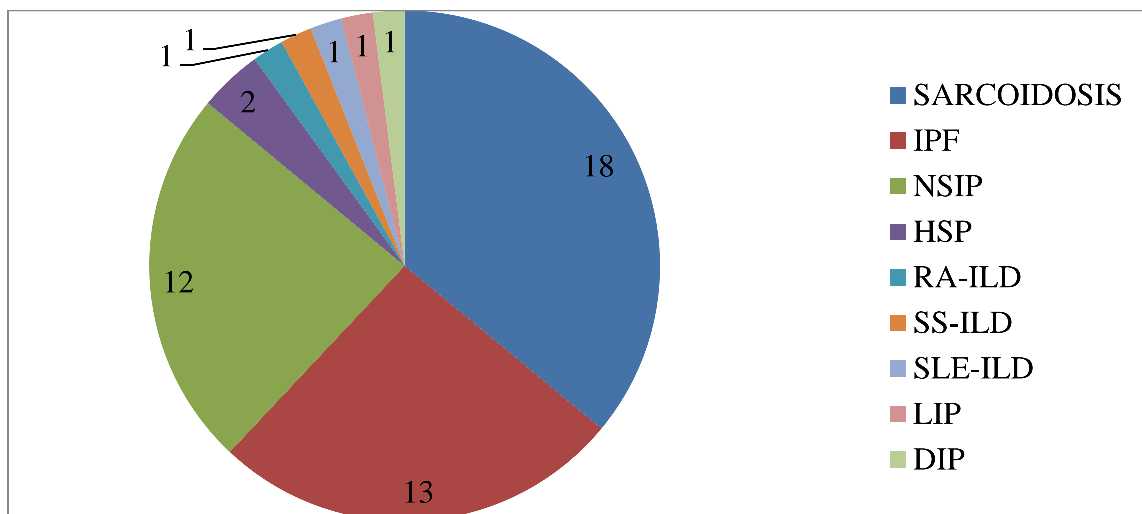


Fig 1: Pie Chart Showing Aetiology Distribution of Patients with Interstitial Lung Disease

Of the study group of 50 patients with interstitial lung disease, Sarcoidosis is the most common cause of ILD consists of 18 patients forming 36% of the study group. IPF is the second most common cause with 13 patients (26%) followed by NSIP with 12 patients (24%).

Duration of Symptoms:

Table 2: Duration of Symptoms in ILD Patients

	Overall	Sarcoidosis	IPF	NSIP	HSP	RA-ILD	SS-ILD	SLE	LIP	DIP
Avg. Duration of symptoms (yrs)	2.5	2.2	2.2	2.5	2.8	4.5	3.5	3	4.2	3.5

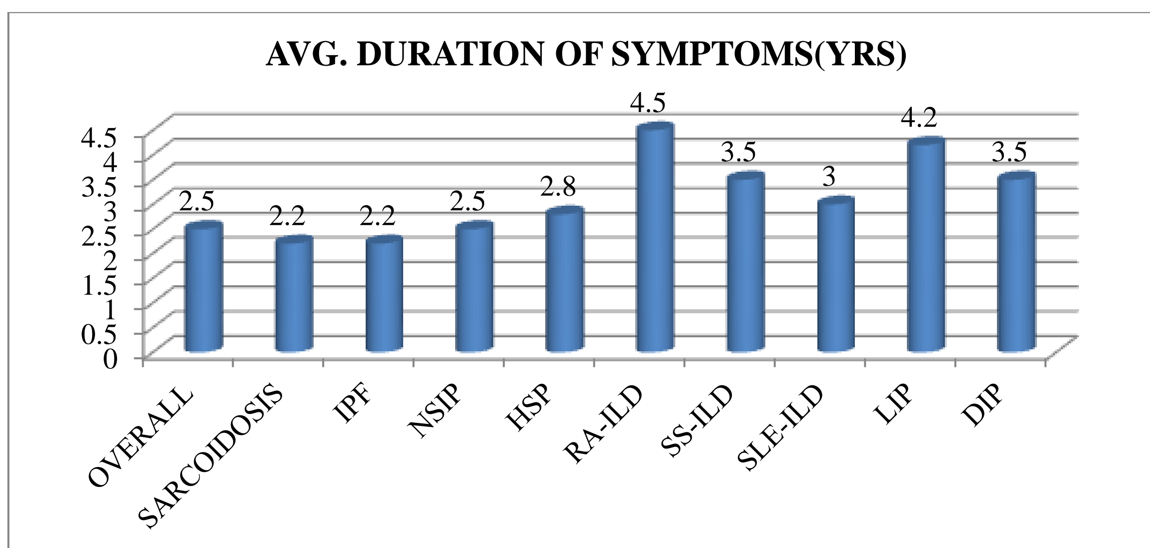


Fig 2: Bar Diagram Showing Duration of Symptoms in ILD Patients

Average duration of symptoms in ILD patients in this study is 2.5 years. Sarcoidosis and IPF both having average duration of symptoms 2.2 yrs which is minimum in the study group while RA-ILD patient have duration of symptoms for 4.5 yrs, maximum in the study group.

AGE AT PRESENTATION:

Table 3: Age at Presentation in ILD Patients

	Overall (yrs)	Sarcoidosis (yrs)	IPF (yrs)	NSIP (yrs)	HP (yrs)	RA-ILD (yrs)	SS-ILD (yrs)	SLE (yrs)	LIP (yrs)	DIP (yrs)
Average Age at presentation	48.8	45.8	54.9	48.7	45	52	46	39	42	49.3

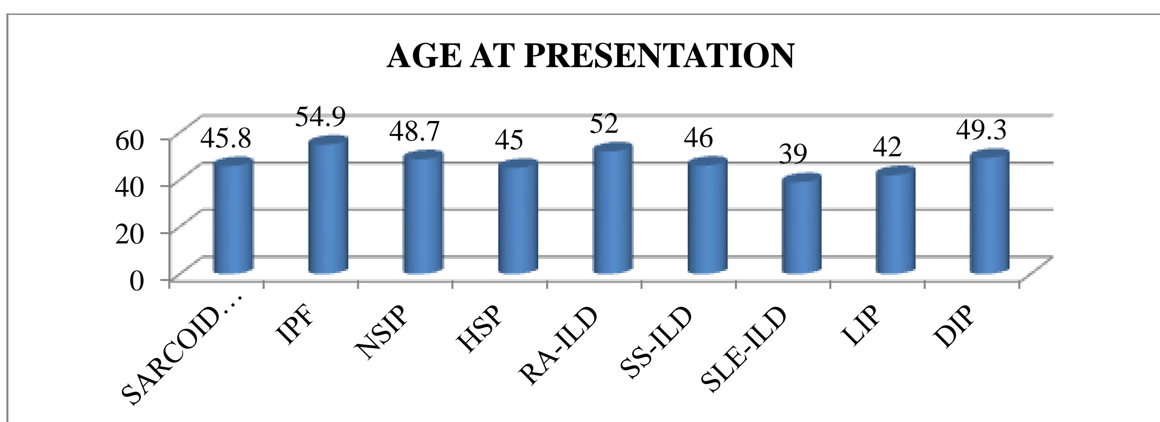


Fig 3: Bar Diagram Showing Age at Presentation in ILD Patients

On an average age at presentation in the study group came out to be 48.8 yrs. Average age at presentation in the sarcoidosis group is 45.8yrs, in IPF group it is 54.9yrs which is maximum in the study group, in NSIP group it is 48.7 yrs. Patient with SLE-ILD have age at presentation of 39 yrs.

Age Distribution

Table 4: Age Distribution in ILD Patients

	< 40 YRS	**40-60 YRS**	**>60 YRS**
NO. OF CASES	6	40	4
PERCENTAGE	12	80	8

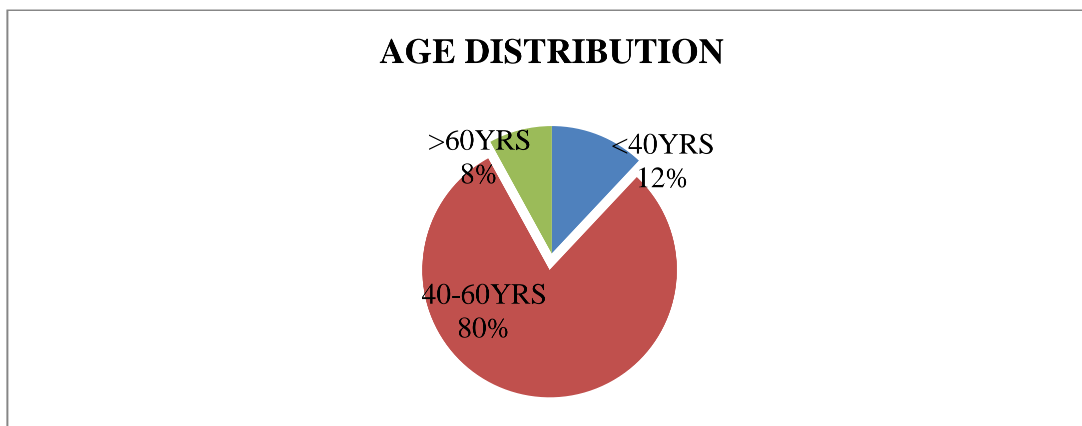


Fig 4: Pie Diagram Showing Age Distribution in ILD Patients

Age distribution of the cases in the study group shows age group 40-60 yrs form 80% of patients consisting of 40 patients. Age group of less than 40 yrs have 6 patients (12%) while age group more than 60 yrs have 4 patients (8%).

Gender Distribution

Table 5: Gender Distribution in ILD Patients

TOTAL SUBJECTS	**MALE**	**FEMALE**
50	23	27

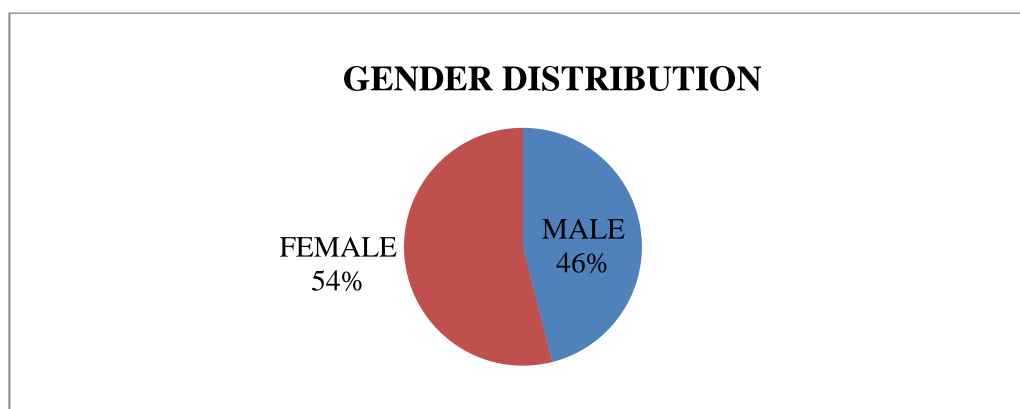


Fig 5: Pie Diagram Showing Gender Distribution in ILD Patients

Gender distribution of the cases in the study group shows increased disease prevalence in females. In the present study of 50 patients, 27 are females (54%) & 23 are males (46%).

Smoking Pattern:

Table 6: Smoking Pattern in ILD Patients

TOTAL SUBJECTS	SMOKER	NON SMOKER
50	8	42

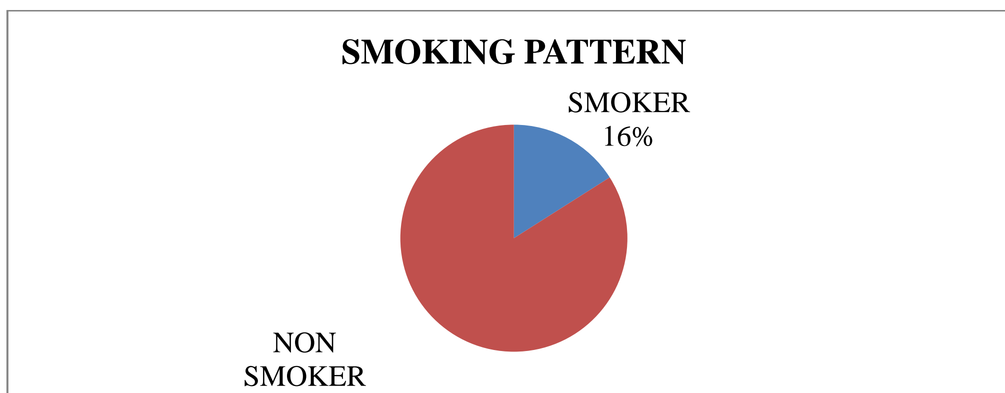


Fig 6: Pie Diagram Showing Smoking Pattern in ILD Patients

Smoking pattern in the study group shows that only 8 patients out of 50 patients are smoker (16%), While 42 patients are non smokers (84%).

Clinical Profile of ILD Patients

	Total (N)	Sarcoidosis (N)	IPF (N)	NSIP (N)	HSP (N)	RA-ILD (N)	SS-ILD(N)	SLE (N)	LIP (N)	DIP (N)
Number of subjects	50	18	13	12	2	1	1	1	1	1
Mean age (yrs)	48.8	45.8	54.9	48.7	45	52	46	39	42	49.3
Male/Female	23/27	7/11	7/6	5/7	2/0	1/0	0/1	0/1	0/1	1/0
Smoking	8	2	3	2	-	-	-	-	-	1
Duration of symptoms(yrs)	2.5	2.2	2.2	2.5	2.8	4.5	3.5	3	4.2	3.5
Cough	45	16	11	11	2	1	1	1	1	1
Dyspnoea	40	15	10	10	1	1	1	0	1	1
Haemoptysis	2	1	-	1	-	-	-	-	-	-
Fever	8	2	2	1	-	1	-	1	1	-
Joint symptoms	6	2	1	1	-	1	-	1	-	-
ATT intake	9	4	2	1	1	1	-	-	-	-
Clubbing	6	1	4	1	-	-	-	-	-	-
Desaturation on 6 MWT (SPo_2 < 88% or fall of 4% from baseline)	17	5	4	6	1	1	-	-	-	-

Table 7: Gender Distribution in Patient With ILD

	NO OF SUBJECTS	MALE	FEMALE
SARCOIDOSIS	18	7	11
IPF	13	7	6
NSIP	12	5	7
HSP	2	2	0
RA-ILD	1	1	0
SS-ILD	1	0	1
SLE-ILD	1	0	1
LIP	1	0	1
DIP	1	1	0

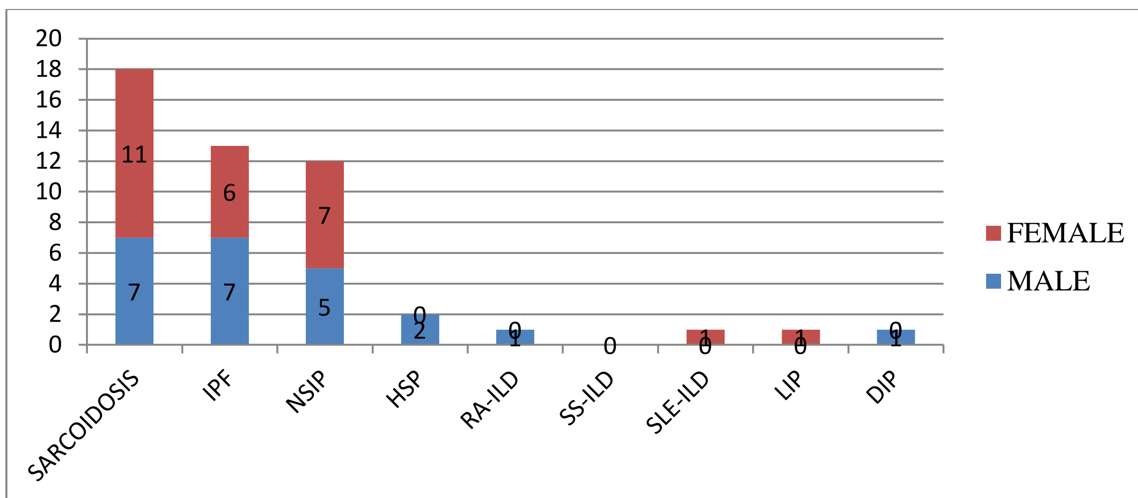


Fig 7: Bar Diagram Showing Gender Distribution in Patient with ILD

Gender distribution in the ILD cases with different etiology shows that, Out of 18 patients of sarcoidosis 11 were females (61%) & 7 were males (39%). In IPF group of 13 patients, 6 were females (46%) & 7 were males (54%). In NSIP group out of 12 patients, 7 were female (58%) & 5 were males (42%).

Signs & Symptoms at Presentation

Table 8: Signs & Symptoms Of Patients With ILD At Presentation

Symptom	Number of cases	Percentage
Cough	45	90.0
Dyspnoea	40	80.0
Haemoptysis	2	4.0
Fever	8	16.0
Joint symptoms	6	12.0
Clubbing	6	12.0
Desaturation at 6 MWT	17	34.0

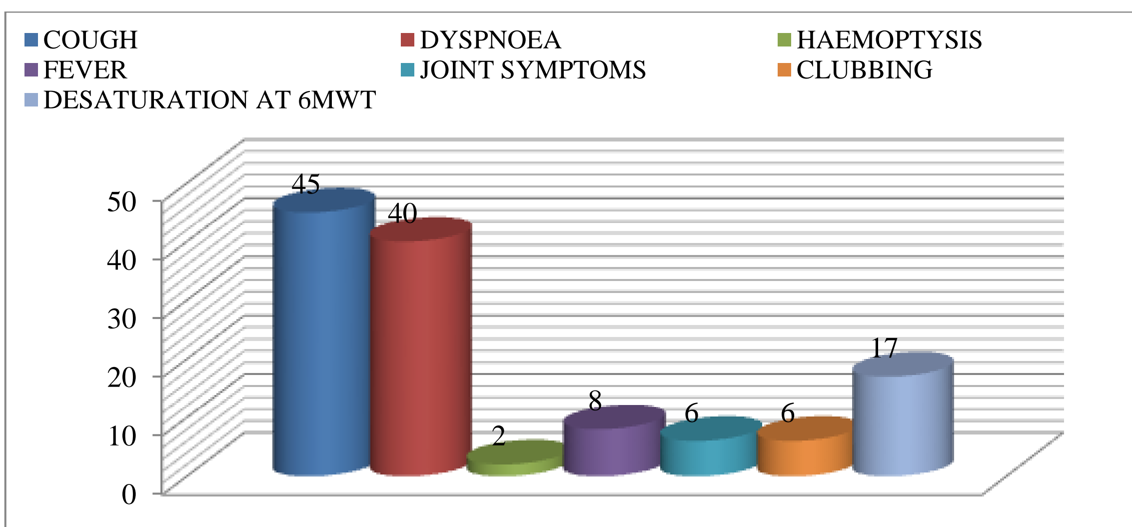


Fig 8: Bar Diagram Showing Signs & Symptoms of Patients with ILD At Presentation

Cough & Dyspnoea are the most common feature at presentation on our study group present in 45 (90%) & 40 patients (80%) respectively. Other features at presentation include fever, haemoptysis, joint symptoms, clubbing etc.

Frequency of Cough & Dyspnoea

Table 9: Frequency of Cough & Dyspnoea in ILD Patients

CAUSE OF ILD	NO OF CASES	PRESENCE OF COUGH	PRESENCE OF DYSPNOEA
SARCOIDOSIS	18	16	15
IPF	13	11	10
NSIP	12	11	10
HSP	2	2	1
RA-ILD	1	1	1
SS-ILD	1	1	1
SLE-ILD	1	1	0
LIP	1	1	1
DIP	1	1	1

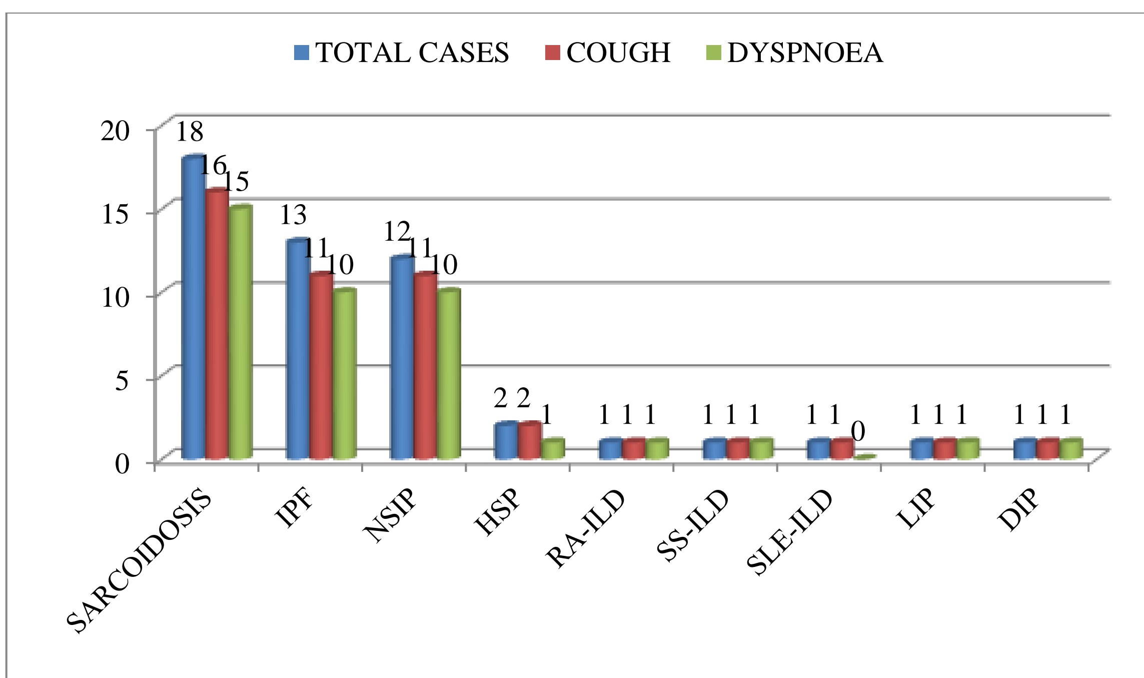


Fig 9: Bar Diagram Showing Frequency of Cough & Dyspnoea in ILD Patients

History of ATT Intake:

Table 10: History of ATT Intake in ILD Patients

	NO OF CASES	POSITIVE HISTORY OF ATT INTAKE
OVERALL	50	9
SARCOIDOSIS	18	4
IPF	13	2
NSIP	12	1
HSP	2	1
RA-ILD	1	1
SS-ILD	1	0
SLE-ILD	1	0
LIP	1	0
DIP	1	0

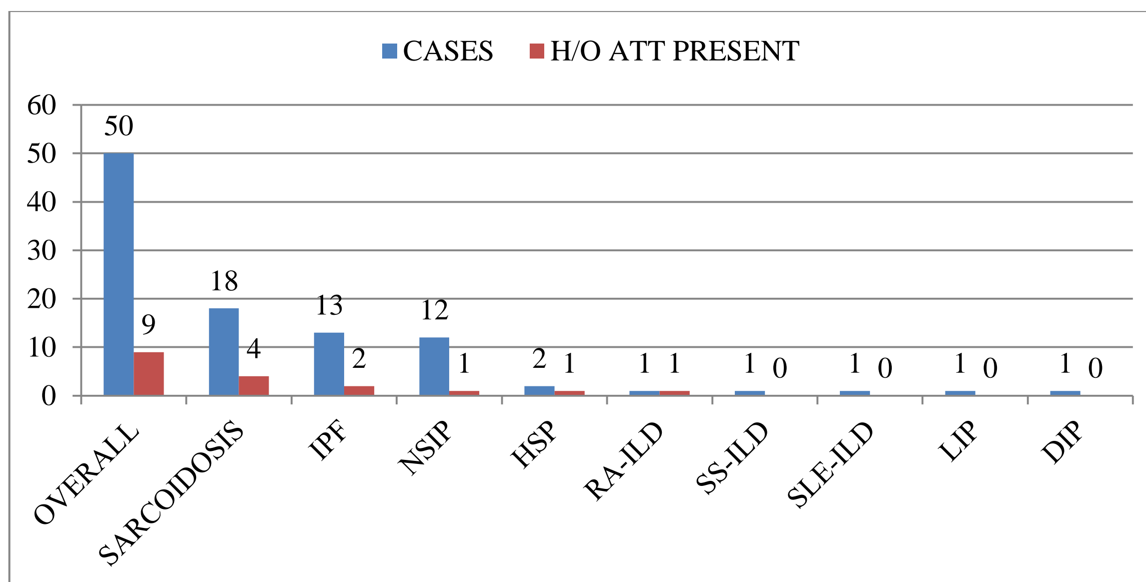


Fig 10: Bar Diagram Showing History of ATT Intake in ILD Patients

As the radiological presentation of ILD some time simulate TB, there is significant number of patients have history of ATT intake. 9 (18%) of total 50 patients have history of ATT intake, most significant in sarcoidosis group in which 4 (22%) out of 18 patients have history of ATT intake.

Radiological Profile of ILD Patients

	Total (N)	Sarcoidosis (N)	IPF (N)	NSIP (N)	HSP(N)	RA-ILD (N)	SS-ILD (N)	SLE (N)	LIP (N)	DIP (N)
CHEST X-RAY FINDINGS										
Reticular/Reticulo-nodular	41	13	11	11	1	1	1	1	1	1
Hilar lymph-adenopathy	10	7	-	2	-	1	-	-	-	-
Honey combing	3	1	2	-	-	-	-	-	-	-
HRCT FINDINGS										
Fibrosis	26	3	13	7	-	1	1	1	-	-
Honey combing	17	1	13	2	-	-	-	-	-	1
Ground glass opacity	19	7	1	7	1	-	1	-	1	1
Interstitial infiltrate	20	6	-	8	2	1	-	1	1	1
Sub pleural opacity	18	2	13	3	-	-	-	-	-	-
Traction Bronchiectasis	9	-	6	2	-	-	1	-	-	-
Lymphadenopathy	10	8	-	2	-	-	-	-	-	-
Pleural opacity	3	2	-	-	-	1	-	-	-	-
Nodules	3	2	-	-	1	-	-	-	-	-
Cysts	-	-	-	-	-	-	-	-	-	-

Chest X-ray Features:

Table 10: Chest X Ray Features of ILD Patients

PATTERN	NO OF CASES	PERCENTAGE OF CASES
RETICULAR/RETICULONODULAR	41	82.0
HILAR LYMPHADENOPATHY	10	20.0
HONEY COMBING	3	6.0

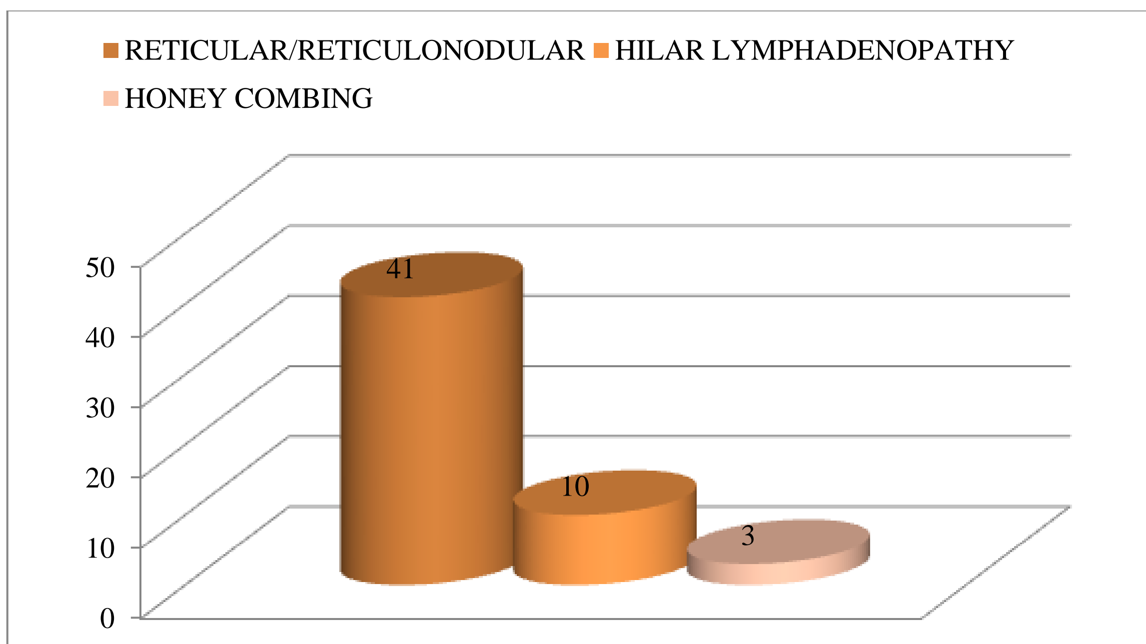


Fig 10: Bar Diagram Showing Chest X ray Features Of ILD Patients

Most common Chest X ray feature in our study group is reticular/ reticulo nodular opacity which was present in 41 patients (82%), followed by hilar lymphadenopathy in 10 patients (20%) and honey combing in 3 patients (6%).

HRCT Features of ILD Patients

Table 11: Table Showing HRCT Pattern in ILD Patients

HRCT PATTERN	NO OF CASES	PERCENTAGE OF CASES
FIBROSIS	26	52.0
HONEYCOMBING	17	34.0
GROUND GLASS OPACITY	19	38.0
INTERSTITIAL INFILTRATES	20	40.0
SUBPLEURAL OPACITY	18	36.0
TRACTION BRONCHIECTASIS	9	18.0
LYMPHADENOPATHY	10	20.0
PLEURAL OPACITY	3	6.0
NODULES	3	6.0

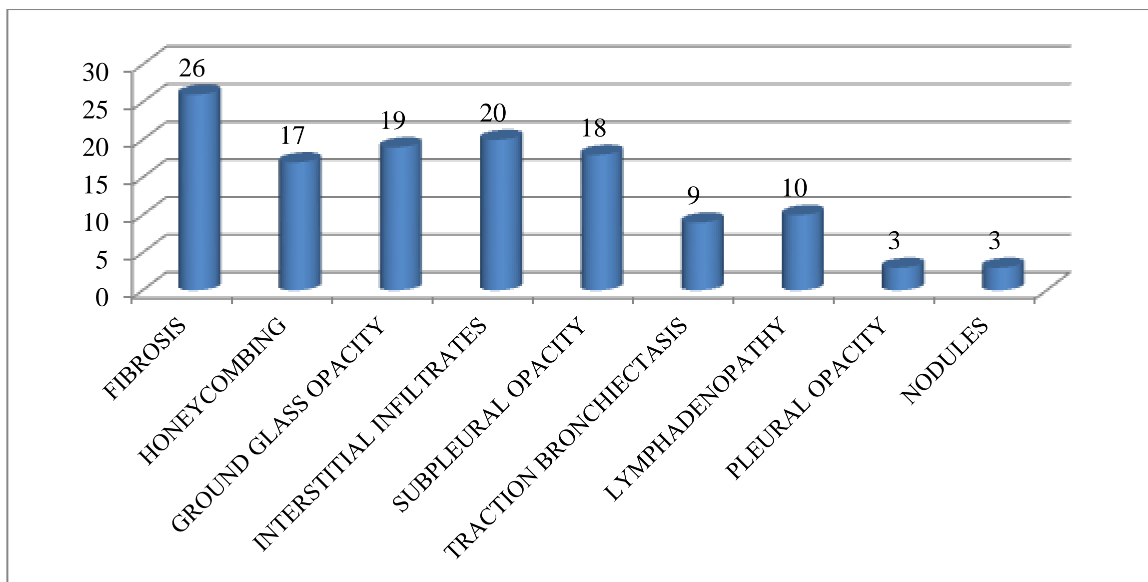


Fig 11: Bar Diagram Showing HRCT Pattern in ILD Patients

Fibrosis (52%) is the most common HRCT feature in our study group followed by interstitial infiltrate (40%), ground glass opacity (38%), sub pleural opacity (36%), honey combing (34%), lymphadenopathy (20%), traction bronchiectasis (18%), pleural opacity (6%), and nodules (6%).

Spirometry Pattern

Table 12: Spirometric Parameters in ILD Patients

SPIROMETRY										
	Total (N)	**Sarcoidosis (N)**	**IPF (N)**	**NSIP (N)**	**HSP (N)**	**RA-ILD (N)**	**SS-ILD (N)**	**SLE (N)**	**LIP (N)**	**DIP (N)**
FEV_1% (mean % predicted)	60	65	55	60	75	58	53	43	53	68
FVC%(mean % predicted)	66	71	58	68	79	68	59	52	58	76
FEV_1/FVC (mean)	87	86	91	87	90	80	95	71	87	95

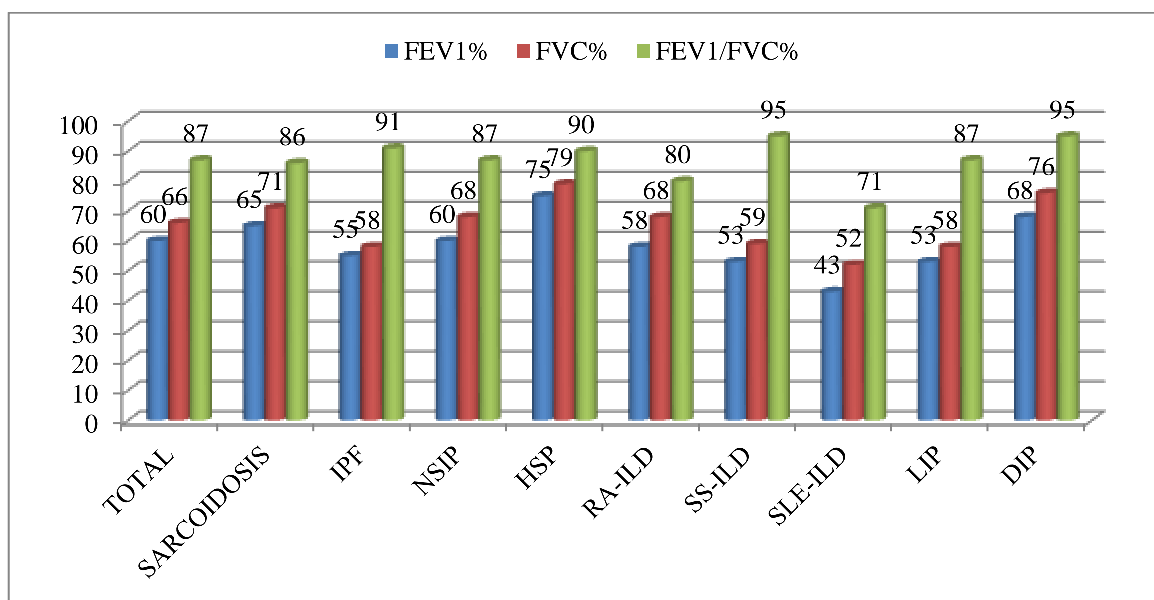


Fig 12: Bar Diagram Showing Spirometric Parameters in ILD Patients

In our study group of 50 patients average FEV_1% came around 60%, FVC around 66%, and FEV_1/FVC around 87%. Group wise spirometric parameters are as described above.

Treatment Modalities:

Table 13: Treatment Modalities in ILD Patients

TREATMENT MODALITY	NO OF CASES TAKING	PERCENTAGE
CORTICOSTEROIDS	50	100
ANTI FIBROTICS	13	26
OTHERS	17	34

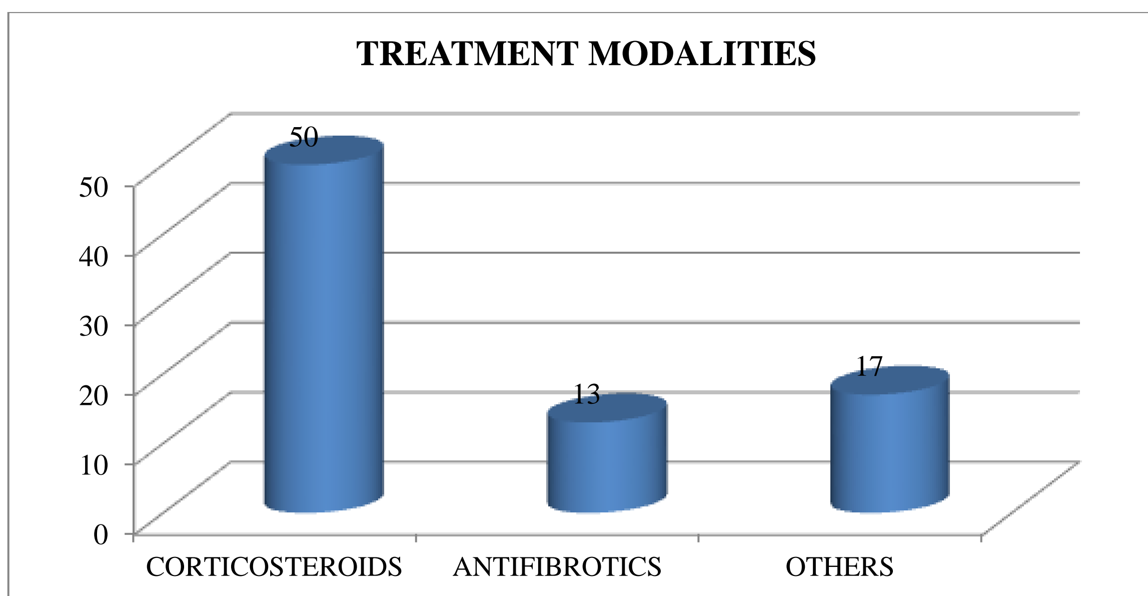


Fig 13: Bar Diagram Showing Treatment Modalities in ILD Patients

Corticosteroids group is the most commonly prescribed group of medication in our study group & was prescribed to almost all patients. Antifibrotic medication was prescribed to around 26% of patients while other medications like mucolytics, cyclophosphamide, azathioprine etc were prescribed to around 34% of patients.

DISCUSSION

The true burden of ILD in India is not clearly known due to under recognition, attributed to lack of awareness, paucity of diagnostic facilities as well as to the huge spectrum that this entity encompasses. Reports from western literature show an increase in the prevalence and incidence of ILD in recent decades [79]. However, data on clinical presentation and diagnosis of the spectrum of ILDs from India is limited. The present study is the study of clinical features, radiological presentation, treatment modalities in ILD patients attending Chest & TB hospital, Amritsar.

In our study, the mean age at presentation is greater than 40 years. This finding is similar to previous studies from India [81-89] as well as western literature [90, 91]. The present study observed increased prevalence in females (54%) as compared to male patients (46%). Similar observations have been reported in other Indian studies [82, 84, 87, 88] and also in a study from Greece. However, an increased prevalence in males has been documented in other studies [85, 87].This can be explained by the fact that the majority of our subject population consisted of patients with sarcoidosis and nonspecific interstitial pneumonia (NSIP), which are female preponderant diseases. In the pool of ILDs analysed, sarcoidosis (36%) was found to be the most common subgroup, followed by IPF (26%) and NSIP (24%). The results were similar to another Indian study [95] and studies from western literature [92, 93]. However, in a study on the occurrence of ILD in Poland based on patients hospitalised in the Regional Pulmonary Unit in Radom, IPF (27.5%) was the most common, followed by sarcoidosis (25%). The incidence of ILDs calculated for the adult population of this region was 5/100,000 [94]. Similarly, studies by Subhash *et al.;* [87] and Udwadia *et al.;* [88] from India, reported a higher prevalence of IPF in the study population.

Another important observation is that almost 18% of cases of ILDs had a history of anti-tubercular treatment, and in the sarcoidosis subgroup this figure was 22%. This might be due to radiological similarities

between ILD and pulmonary tuberculosis and a lack of awareness and paucity of diagnostic facilities in remote areas.

The current study included 18 (36%) cases of pulmonary sarcoidosis, 11 (61.1%) being females. The higher prevalence in females is coherent with findings in western literature [93]. The mean age at presentation was 48.8 years with the average duration of symptoms being 2.5 years; the majority were non-smokers (84%). This data is similar to other Indian studies [95, 96]. In contradiction with the literature [93] clubbing (12%) was an uncommon finding in our study. 6MWT showed significant desaturation (SPo_2< 88% or 4 % fall from the baseline) in 17 (34%) cases. The plausible explanation of this could be the advanced stage of the disease at presentation.

Idiopathic pulmonary fibrosis is a specific type of ILD, with characteristic radiological features and histopathology. In the present study we had 13 (26%) cases of IPF, and it was the second most common subgroup in the pool of ILDs. In contrast, IPF was observed as the most common ILD in other Indian [86-88] and western studies [97]. In the current study, mean age at presentation was 54.9 years, male to female ratio was 7:6 and 23.07% of cases were smokers. The current study agrees with data from western literature in terms of age at presentation with disease typically occurring in 6th–7th decade of life. The literature [92] shows more men being diagnosed with IPF than women and the majority being smokers. However, our study reported around equal prevalence in male and female subjects and a more prevalence of smoking. In another Indian study by Subhash *et al.;* [87] out of 33 cases of IPF, 16 were females and smoking was present in only 18% of all IPF cases. Another point that merits mention is that diagnostic criteria vary across studies, leading to differences in epidemiological parameters of IPF. In our study, on 6MWT, 34% of cases showed significant desaturation (SPo_2< 88% or 4 % fall from the baseline) at presentation. This finding has clinical implications as studies have advocated that desaturation (i.e. a decline in oxygen saturation to below 88%) during 6MWT is a marker for increased risk of mortality[100].

In the present study, we had 12 (24%) cases with a diagnosis of NSIP based on clinical, radiological and pathological features, but we were unable to elucidate the cause. The mean age at presentation was 48.7 years, 7 were females and only 16.6% were smokers. The review of literature shows NSIP has a mean age of 52 years and is more common in females and never smokers [101].

Of 3 cases diagnosed as CTD -associated interstitial lung disease (CTD-ILD), lung involvement at presentation was observed in 1 case each of rheumatoid arthritis (RA), scleroderma & SLE. The prevalence of RA-ILD varies from 5–58% [102] and ILD in systemic sclerosis is observed in 40–80% of cases [103]. The prevalence of CTD–ILD in India has been reported as ranging from 5.6% to 50.8% in various studies [87, 91].

Hypersensitivity pneumonitis (HP) was diagnosed in 2 (4%) cases; all were associated with pigeon exposure, with duration of exposure ranging from 3–6 years. In a previous study from India, Udwadia *et al.;* [94] reported HP in 15 (6%) from a total of 273 cases. Other ILDs diagnosed as per clinico-radio-pathological criteria in the current study were desquamative interstitial pneumonia (DIP) 1 case, lymphocytic interstitial pneumonia (LIP) 1 case.

Regarding treatment modalities patients using in our study group, Corticosteroids is the most commonly used group, with all 50 patients (100%) taking this medication, followed by anti fibrotic medication in 13 patients (26%), other less commonly used medications like mucolytics, cyclophosphamide, azathioprine etc in 17 patients (34%)

SUMMARY AND CONCLUSION

In present study, fifty patients diagnosed as ILD based on clinical, radiological and PFT findings attending OPD and/or admitted in Chest and TB hospital, Amritsar are included in the study. They were studied according to their demographic features, clinical characteristics, Radiological findings and treatment modalities.

1. There were 23 males and 27 females yielding a male: female ratio of 23:27.
2. 40 patients (83.3%) were between 40-60 years of age. The mean overall age of patients was 48.8 years.
3. 8 patients (16%) were smokers and 42 patients (84%) non smokers, yielding a smoker: non-smoker ratio of 4:21. All smokers are of male gender.
4. Sarcoidosis came out as most common cause of ILD with 18 patients (36%) followed by IPF (26%) & NSIP (24%) respectively.
5. Mean duration of symptoms of illness at presentation overall came out around 2.5 years.
6. The common symptoms at presentation included cough (90%), breathlessness (80%) followed by fever (16%), joint symptoms (12%), hemoptysis (4%).
7. There is history of ATT intake in 9 patients (18%), more frequently in sarcoidosis group (22%).
8. Of the total 50 patients 17 (34%) were showing significant desaturation on 6 minute walk test, that is SPo_2 less than 88% or more than 4% fall in baseline SPo_2.

9. Common Chest X ray findings were reticular/reticulo nodular pattern (82%), hilar lymphadenopathy (10%), honeycombing (6%) etc.
10. Common HRCT findings were fibrosis (52%), interstitial infiltrates (40%), ground glass opacity (38%), sub pleural opacity (36%), honeycombing (34%), lymphadenopathy (20%), traction bronchiectasis (18%), pleural opacity (6%), nodules (6%) etc.
11. Average FEV_1, FVC, FEV_1/FVC came around 60, 66, and 87 respectively. SLE-ILD group has worst pulmonary function test.
12. All 50 patients were taking corticosteroids (100%), 13 patients were on anti fibrotic & anti inflammatory drugs (26%), 17 patients were on other medications (34%).

This study describes the spectrum of ILDs prevalent in patients presenting to outdoor & indoor department of Chest & TB hospital, Govt. Medical College, Amritsar (Punjab). Diagnosis of ILDs at an early stage is paramount to prevent/delay progression to irreversible damage to the lungs, especially in treatment-responsive ILDs like sarcoidosis. Hence, in a developing country like India, with high prevalence of pulmonary tuberculosis, education and awareness of general practitioners and physicians about ILDs deserves special attention.

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