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Original Research Article

"A CROSS-SECTIONAL STUDY ON INTERSTITIAL LUNG DISEASES ATTENDING A TERTIARY CARE CENTER"

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ABSTRACT:

Background: The interstitial lung diseases are a clinically challenging and diverse group of over 150 disorders characterized by varying degrees of fibrosis and inflammation of the lung parenchyma or interstitium. The major ones are Idiopathic Pulmonary Fibrosis (IPF), Sarcoidosis, ILD associated with collagen vascular diseases (CTD-ILDs). CT and HRCT scans are more sensitive and can detect abnormalities better than chest radiography.

AIM: To study the clinical profile, the radiological profile (chest X-ray and HRCT scan) and the spirometry profile of ILD patients.

Material & Methods: Study Design: Prospective cross-sectional study. **Study area**: Dept. of. Pulmonary Medicine, Government Medical College, Ananthapur, Andhra Pradesh **Study Period:** April 2021- March 2022 (1 year). **Study population:** Patients who had symptomatology of ILDs attending Dept. of. Pulmonary Medicine. **Sample size:** Study consists a total of 52 patients. **Sampling method:** Simple Random sampling method. **Study tools and Data collection procedure:** Every consecutive patient of Interstitial lung disease was included in the study. Detailed demographic and clinical parameters including age, sex, occupation, and habits like smoking were taken. Clinical symptoms cough, haemoptysis, breathlessness, loss of appetite, loss of weight, and clinical signs were evaluated in all patients. **Statistical Analysis:** The data was collected, compiled and compared statistically by frequency distribution and percentage proportion. Quantitative data variables were expressed by using Descriptive statistics (Mean ± SD).

Results: In the present study total number of patients are 52, among them 19 were males and 33 were females. Male : female ratio is 1:1.7.Among 52 patients of interstitial lung disease, 24 patients (46%) are diagnosed as IPF and 28 patients (54%) are diagnosed as non IPF.

CONCLUSION: High degree of suspicion is needed in diagnosing Interstitial lung disease and treating them. Our study shows a female preponderance among our Patients of ILD and IPF.

Key words: Interstitial lung diseases, ILD, Idiopathic Pulmonary Fibrosis (IPF)

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INTRODUCTION:

The interstitial lung diseases are a clinically challenging and diverse group of over 150 disorders characterized by varying degrees of fibrosis and inflammation of the lung parenchyma or interstitium. However ILDs are difficult to classify because approximately 150 plus known diseases are characterized by interstitial involvement, either as a primary disease or as a part of multi-organ process as may occur in collagen vascular diseases.One useful approach is to separate ILDs into two groups, those with known and those with unknown causes.

Among ILDs of known cause, the largest group includes diseases due to inhalation of inorganic dusts, organic dusts and various irritant and noxious gases. The number of ILDs of unknown cause is also very large. The major ones are Idiopathic Pulmonary Fibrosis (IPF), Sarcoidosis, ILD associated with collagen vascular diseases (CTD-ILDs).

Idiopathic Pulmonary Fibrosis (IPF) is the most common disease representing at least 30% of the incident cases. The disease process extends into alveolar spaces, acini, bronchiolar lumen and bronchioles. The inflammation usually referred to as alveolitis is associated with spread to adjacent portions of interstitium and vasculature, resulting in derangement of alveolar capillary architecture leading to Alveolo-capillary membrane damage and loss of gas exchange units eventually ending in interstitial fibrosis. The scarring and distortion of lung tissue leads to deranged gas exchange and ventilator function.

In addition to a detailed medical history, physical examination and routine lab tests, a rational approach to a diagnostic evaluation includes non-invasive diagnostic techniques such as pulmonary function tests including exercise stress test and chest imaging. Pulmonary function tests are an important means for establishing the presence of ILD. They are also useful for the clinical monitoring of the disease course and to assess the efficacy of treatment. CT and HRCT scans are more sensitive and can detect abnormalities better than chest radiography. Preliminary studies suggest that when HRCT pattern is combined with clinical and radiological findings, it can have a diagnostic utility to increasing certainty with improved visualization and expertise. Interstitial lung diseases are increasingly diagnosed nowa days because of better awareness & availability of HRCT scan.

In the current study diagnosis of the ILD is done on the basis of clinical and radiological examination results in view of the trauma and associated complications of open lung biopsy.

AIM: To study the clinical profile, the radiological profile (chest X-ray and HRCT scan) and the spirometry profile of ILD patients.

Material & Methods:

Study Design: Prospective cross-sectional study.

Study area: Dept. of. Pulmonary Medicine, Government Medical College, Ananthapur, Andhra Pradesh.

Study Period: April 2021- March 2022 (1 year).

Study population: Patients who had symptomatology of ILDs attending Dept. of. PulmonaryMedicine.

Sample size: Study consists a total of 52 patients.

Sampling method: Simple Random sampling method.

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Inclusion Criteria:

1.Patients with cough, SOB on exertion with or without extrathoracic manifestations like arthralgias, skin rashes or pigmentation, dry mouth, dry eyes and features suggestive of raynaud's phenomenon(pain in the fingers and turning blue on exposure to cold) etc.

2.Patients of age more than 16 yrs.

3.Patients with Velcro rales on clinical examination suggestive of ILD on respiratory examination.

4.Radiological appearance suggestive of ILD.

5.Known cases of Connective Tissue Diseases(CTDs) presenting with respiratory complaints or chest X-ray changes suggestive of ILD, attending to Pulmonology department.

Exclusion Criteria:

1.ILD like infections eg. Miliary tuberculosis and Pneumocystis jiroveciipneumonia.

2.ILD like malignancies eg. Lymphangitiscarcinomatosis or Miliarycarcinomatosis.

3.Pulmonary Kochs co-existing with ILD.

4.Patients of age less than 16 yrs.

5.All HIV reactive patients.

6.Sick ,moribund patients and uncooperative patients .

Ethical consideration: Institutional Ethical committee permission was taken prior to the commencement of the study.

Study tools and Data collection procedure:

Every consecutive patient of Interstitial lung disease was included in the study. Detailed demographic and clinical parameters including age, sex, occupation, and habits like smoking were taken. Clinical symptoms cough, haemoptysis, breathlessness, loss of appetite, loss of weight, and clinical signs were evaluated in all patients. Baseline Chest X-ray (Posteroanteriorview). Base line blood investigations like Haemoglobin,TLC, DC, ESR, peripheral smear , blood urea, serum creatinine, Random Blood Sugar, Serum bilirubin, Bleeding Time ,Clotting Time were done. Mantoux, sputum for AFB, sputum for malignant cytology, sputum for gram stain and Culture & Sensitivity were done. Patients were screened for HIV and HBsAg. HRCT Chest and FOB were done. Pulmonary function tests like Spirometry , 6 minute walk test and DLCO were done . The diagnosis of Interstitial lung disease was established by HRCT or Chest Xray PA view.

Statistical Analysis:

The data was collected, compiled and compared statistically by frequency distribution and percentage proportion. Quantitative data variables were expressed by using Descriptive statistics (Mean ± SD). Qualitative data variables were expressed by using frequency and Percentage (%).P values of <0.05 were considered statisticallysignificant. Data analysis was performed by using SPSS Version 20.

Observations & Results:

Table 1: Number ofIdiopathic Pulmonary Fibrosis (IPF) and non IPF patients

	Number of patients n=52	**Percentage**
IPF	**24**	**46%**

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Non IPF	**28**	**54%**
Total	**52**	**100%**

Among 52 patients of interstitial lung disease, 24 patients (46%) are diagnosed as IPF and 28 patients (54%) are diagnosed as non IPF.

Table 2:Sex distribution in ILD Patients

sex	**Number of patients**	**Percentage**
Males	19	36.5%
Females	33	63.5%
Total	52	100%

In the present study total number of patients are 52, among them 19 were males and 33 were females. Male : female ratio is 1:1.7.

Table 3: Age distribution ILD Patients

Age (years)	**Male**	**Female**	**Percentage**
16-25	0	1	1.92%
26-35	3	2	9.6%
36-45	3	13	30.76%
46-55	4	6	19.2%
56-65	8	11	36.53%
66-75	0	0	0%
76-85	0	0	0%
86-95	1	0	1.92%
Total	19	33	100%

The mean age of patients in this study was 50.19 years. Most of the patients were in 56-65 years age group.

Table 4: Symptoms in ILD Patient

Symptoms	**No. of Patients**	**Percentage**
Cough	52	100%

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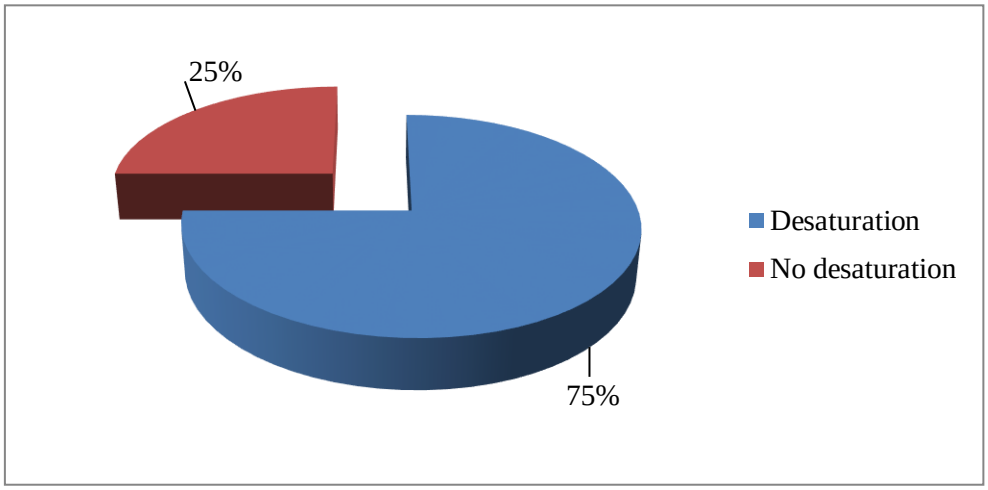
Breathlessness	52	100%
Loss of weight	8	15.38%
Loss of appetite	8	15.38%
Haemoptysis	2	3.84%

In the present study all the patients presented with cough and breathlessness, constitutional symptoms like loss of weight and loss of appetite was present in 15.38% and haemoptysis was present in 3.84% of patients.

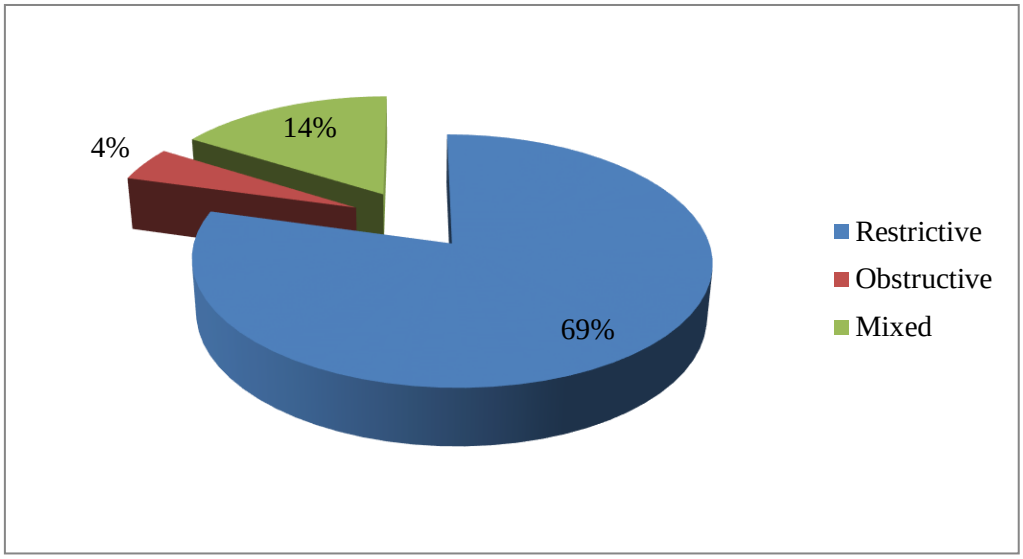
Pulmonary function tests

Figure 1: 6min walk test in ILD Patients



Among 52 patients 39 patients (75%) were desaturated and 13 patients (25%) were not desaturated.

Figure 2:Spirometry pattern in ILD Patients



Among 52 patients 36 patients (69%) showed restrictivepattern, 14 Patients (27%) showed mixed pattern and 2 patients (4%) showed Obstructive pattern in spirometry.

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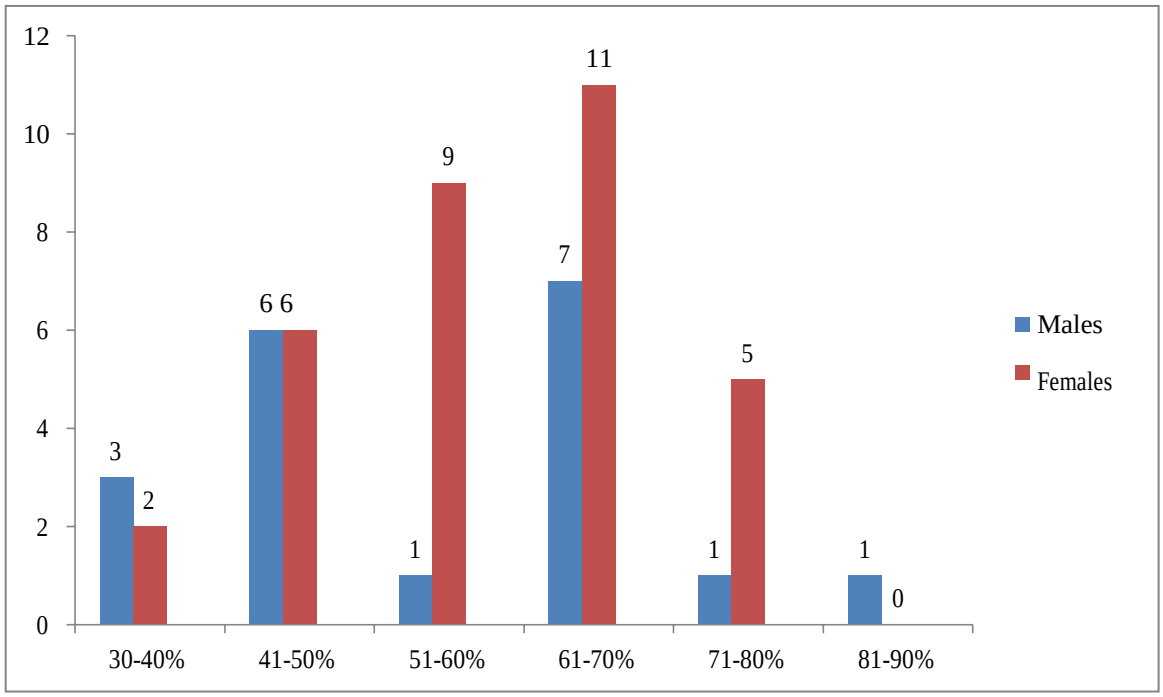
Figure 3: DLCO in ILD Patients

DLCO test done for all 52 patients and 5 patients are in 30- 40%,12 patients are in 41-50% ,



10 patients are in 51-60 % , 18 patients are in 61-70%, 6 patients are in 71-80%and 1 patient in 81-90% of DLCO.

Discussion:

In the present study total number of patients are 52, among them 19 were males and 33 were females. Male: female ratio is 1:1.7.The mean age of patients in this study was 50.19 years. Most of the patients were in 56-65 years age group.Among 52 patients of interstitial lung disease, 24 patients (46%) are diagnosed as IPF and 28 patients (54%) are diagnosed as non IPF.

In the present study of 52 patients of ILD, males patients are 19(36.5%) and female patients33(63.5%) in number. AbhishekTiwari[(1)] et al in his study of Study of Clinico radiological Profile and Treatment Modalities in Interstitial Lung Disease among 50 patients 27 are females (54%) & 23 are males (46%).

MosavirAnsarie [(2)]et al in his study of Profile of Interstitial Lung Diseases in Pakistan,published Pulmonology Clinics Registry Data: Jan 2012 - Aug 2013 106found that among ILD patients, females (n=70) outnumbered males (n=36).

Kumar Adesh [(3)]etal in his study Of the 116 ILD cases there were 70 male (60.34%) and 46 (39.66%) females.

Thus various studies in India and abroad showed variable preponderance of ILD among male and female population. Our study showed a female: male ratio of **1.73:1** among ILD patients. In the present study of 24 IPF patients there were 10(41.66%) male patients and 14(58.34%) female patients. Our study showed female: male ratio of 1.4:1 with a female preponderance among IPF patients.

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Joyce S Lee[4] et al in their study of prevalence and clinical significance of circulating auto antibodies in Idiopathic pulmonary fibrosis found there were male predominance in the IPF patients .

In a population based study done by Evan s R. Fernández Pérez[5] et al titled Incidence, Prevalence, and Clinical Course of Idiopathic Pulmonary Fibrosis Among the study population of 47 cases diagnosed as IPF, 19(40.4%) were women and 28(59.6%) were men.

In a study done by Subramanian Natarajan,[6] titled Idiopathic Pulmonary Fibrosis, among 46 Patients from Western India 59% were females.Thus different studies of IPF showed variable preponderance ofIPFamong females and males.

In the present study mean age is 50.19years.In the study of KumarAdesh[3] et al the overall mean age of ILD patients was 45.24 years.In the study of Khaled Hussein[7]et al study the mean age of ILD patients was 45.7 years.In BoubacarEfared[8] et al in his study of The diagnostic value of theBronchoalveolar lavage in interstitial lung diseases the mean age of patients with ILD was 52.78 years.In the study of Brenda Varela[9] et al in the chest meeting on diffuse lung diseases the mean age of the patients was 63±11.75 years.In the study done by NesrinMogulkoc[10] MD et al on Pulmonary hypertension in Interstitial Lung Disease the mean age was 56 years.Thus mean age of ILD is varied from 45-56 years .the observation is similar in our study.

In the present study all patients are presented with cough and breathlessness.In Kumar Adesh[3] (MD) et al study the most frequent presenting symptom in the ILD was cough present in 98 (84.45%), followed by exertional dyspnoea in 86 (74.13%).AbhishekTiwari[1] et al study Cough was present in 90% of patients & Dyspnoea was present in 80%of patients.In Gagiya Ashok K[11] et al study Common symptoms were breathlessness on exertion (100%), dry cough (43.29%), anorexia (50%)and joint pain (16.65%).

Dry cough is present in significant number of patients of ILD becauseof interstitial and parenchymal involvement. cough may become productive because of secondary infection and bring the abnormality to the attention of the patient and the physician .

Breathlessness is a predominant symptom in almost all the cases of IPF. In our study all the patients presented with breathlessness and most of them were in grade 2 to 4. This is probably because of severity of ILD in our study.

In the present study out of 52 patients 45(90%) have shown reduced DLCO and of mean 60.66%. In a study done by Pamela A. Morganroth[12],et al Of the 71 patients who had Interstitial lung disease as defined by CT results all had a reduced DLCo with mean of 59%.

In the study done by Barney Thomas Jesudason Isaac[13] et al on The correlation of symptoms, pulmonary function tests and exercise testing with high-resolution computed tomography in patients with idiopathic interstitial pneumonia in a tertiary care hospital in South India showed the mean DLCO of 56%.

Only 28% of ILD patients have a DLCo of 30-40%. 42.30% have DLCo of 40 to 60% and 48.07% patients have a DLCo of 60% or more. All the ILD patients showed decreased DLCo. Among IPF patients 20.83% have a DLCo of <40%. 54.16% have DLCo of 40 to 60%. 25% have a DLCo of >60%. None of the 24 IPF patients have a DLCo of >70%.All the patients of IPF in our study have defective DLCo and nearly 21% have a very severe disease with low DLCo.

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A six minute walk test revealed 75% of ILD patients desaturated to >4% of their resting sp02 on exercise. It is also indicative of severity of ILD in our study.Spirometry revealed 69% of the ILD patients have restrictive defect ,4% of ILD patients have obstructive defect and 26.92% have combined obstructive and restrictive defect.

In the present study out of 52 cases, 43(82%) patient's chest radiographs revealed reticulonodular pattern.

In a study done by Abhishek Tiwari(1) et al among 50 diagnosed patients of interstitial lung diseases , most common Chest X ray feature in study group was reticular/ reticulo nodular opacity which was present in 41 patients (82%).

In a study done by Kumar Adesh(3) et al on profile of Interstitial lung diseases at tertiary care centre of Northern India most common X-ray feauture was reticulonodular opacity 82.75%.

CONCLUSION:

High degree of suspicion is needed in diagnosing Interstitial lung disease and treating them. Our study shows a female preponderance among our Patients of ILD and IPF. Mean age of patients of ILD in our study is 50.19 years mean age of patients of IPF is 57.63 suggesting that both ILD &IPF occur in the 5^{th} and 6^{th} decades of life . ILD can occur in female patients much earlier in 2^{nd} and 3^{rd} decade. Early symptomatic breathlessness and DLCO are early indicators of severity of ILD and IPF. But restrictive lung disease by spirometry occurs in late in course of disease. Lung biopsy can help us to identify the pathology but majority of the times it may not be required for diagnosis.

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