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Clinicoradiological Profile Of Patients With Diffuse Parenchymal Lung Disease From A Tertiary Care Centre In South India.

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ABSTRACT

The diagnosis of Diffuse Parenchymal Lung Disease (DPLD) requires a multidisciplinary approach with a reconciliation of clinical, radiological, and histopathological information. Clinical evaluation alone is inadequate in making an aetiological diagnosis of DPLD except in certain specific conditions like connective tissue diseases with typical manifestations. To study the Clinical features, Radiological presentation, and Demographic profile of patients with Diffuse Parenchymal Lung Disease (DPLD). The materials used in the study consisted of 62 patients with Diffuse Parenchymal Lung Disease who were admitted to the Department of General Medicine, Government Kilpauk Medical College & Hospital, Chennai. The mean age of patients was 59.16 ± 7.175 years. The majority of the patients, 44 (71%), were male. Among patients with diffuse parenchymal lung disease (DPLD), the most common etiology was idiopathic pulmonary fibrosis, accounting for 15 cases (24.2%). The most frequently reported complaint was breathlessness, observed in 20 patients (32.3%). Radiological findings predominantly showed a reticular pattern in 17 cases (27.4%). A significant association was found between etiology, complaints, and radiological profile with gender, with a p-value of 0.001. Diffuse parenchymal lung disease (DPLD) is a chronic lung condition characterized by the progressive loss of lung function. Idiopathic pulmonary fibrosis (IPF), a common subtype of DPLD, is associated with a rapid decline in lung function. On the other hand, connective tissue disease-associated DPLD (CTD-DPLD) is a treatable condition that can be diagnosed based on clinical and radiological findings. Early detection of CTD-DPLD is essential to prevent or delay the progression of irreversible lung damage. To enhance understanding of the condition's spectrum, further prospective epidemiological studies, along with increased education and awareness, are necessary.

Keywords: Diffuse Parenchymal Lung Disease, Idiopathic Pulmonary Fibrosis, Connective Tissue - Interstitial Lung Disease (CTD-ILD).

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INTRODUCTION

Diffuse parenchymal lung disease (DPLD), also known as interstitial lung diseases (ILDs), encompasses a broad group of disorders characterized by varying degrees of inflammation in the interstitium or lung parenchyma. This inflammation often leads to pulmonary fibrosis, resulting in impaired gas exchange, reduced oxygen permeability, and increased lung stiffness [1, 2]. Patients with interstitial lung disease (ILD) commonly present with persistent dry cough, progressive activity intolerance, and shortness of breath. On chest auscultation, fine crepitations are often detected. In advanced cases, signs of right heart failure and pulmonary hypertension may also be present. Effort-induced oxygen desaturation is a frequent finding and is associated with a poorer long-term prognosis [3]. Interstitial lung diseases (ILDs) encompass a diverse group of over a hundred disorders classified based on shared radiological, clinical, and pathological features. These include ILDs with recognized causes, such as sarcoidosis, idiopathic interstitial pneumonia, and lymphangioleiomyomatosis (LAM), as well as other rare ILDs. Achieving a definitive diagnosis requires a multidisciplinary approach involving a detailed patient history, physical examination, laboratory investigations, pulmonary function tests, imaging studies, and, in some cases, lung biopsy [4]. Diffuse parenchymal lung disease (DPLD), a common and often fatal form of pulmonary involvement, is characterized by various patterns of inflammation and fibrosis observed on high-resolution computed tomography (HRCT) scans and lung biopsy specimens. In patients with connective tissue disorders (CTDs), advancements in the characterization of radiological patterns and pathological findings, originally developed for idiopathic interstitial pneumonia, are increasingly being applied to aid diagnosis and management [5-7]. The evaluation for connective tissue diseases (CTDs) is a crucial component in the diagnosis and management of patients with interstitial lung disease (ILD). CTDs arise from uncontrolled autoimmune reactions and associated inflammation, which can affect multiple organ systems. ILD has been reported in approximately 15% of CTD patients overall, with higher prevalence observed in specific conditions such as systemic sclerosis (SS), where rates can reach up to 26% [8]. The initial clinical evaluation of a patient with diffuse parenchymal lung disease (DPLD) often relies on chest imaging, particularly high-resolution computed tomography (HRCT), due to the limited diagnostic information obtained from history and physical examination alone. Radiological investigations play a pivotal role in guiding further management of these patients. This study was conducted to develop a clinicopathological profile of patients with DPLD from a tertiary care center in South India. Given that DPLD is a heterogeneous group of disorders with diverse aetiologies and treatment approaches, understanding its clinical and radiological spectrum is essential for effective management.

MATERIALS AND METHODS

This Observational Cross-sectional Study was conducted for 6 months in 2024 at Government Kilpauk Medical College & Hospital, Chennai.62 patients with Diffuse Parenchymal Lung Disease were included. This study was conducted after approval from the institutional ethics committee, each patient was considered for the study after taking an informed consent.

Inclusion Criteria

- Age ≥18 years
- Diagnosed cases of Diffuse Parenchymal Lung Diseases

Exclusion Criteria

- Patients not consenting to the study
- Age < 18years
- Pregnant & Lactating mothers
- Patients having other associated significant Bronchopulmonary Disease Pulmonary Tuberculosis, COPD, Bronchiectasis, Asthma, Pyogenic Pneumonia, Bronchogenic carcinoma, known HIV positive, Patients taking Immunomodulating drugs
- Patients with Cardiac Disorders

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RESULTS

Table 1: Distribution of age in years among Diffuse Parenchymal Lung disease patients.

Age	Frequency	Percentage
40-50 Years	13	21.0
51-60 Years	18	29.0
61-70 Years	31	50.0
Total	62	100.0
Mean± Std. Deviation	**59.16±7.175**	

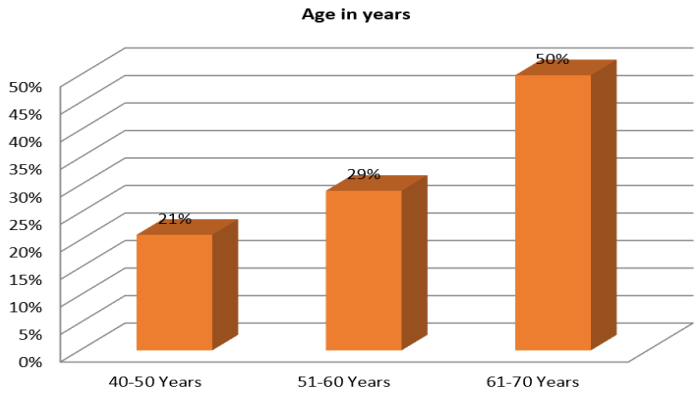

Table 2: Distribution of Gender among Diffuse Parenchymal Lung disease patients.

Gender	Frequency	Percentage
MALE	44	71.0
FEMALE	18	29.0
Total	62	100.0

Table 3: Distribution of aetiological among Diffuse Parenchymal Lung disease patients.

Aetiological	Frequency	Percentage
Metastasis	4	6.5
Pneumoconiosis	5	8.1
Allergic bronchopulmonary aspergillosis (ABPA)	6	9.7
Cryptogenic organizing pneumonia (COP)	7	11.3
Hypersensitivity pneumonitis (HP)	3	4.8
Sarcoidosis	8	12.9
Non-specific interstitial pneumonia (NSIP)	4	6.5
Connective tissue disease-interstitial lung disease (CTD-ILD)	10	16.1
Idiopathic pulmonary fibrosis (IPF)	15	24.2
Total	62	100.0

Table 4: Distribution of Complaints among Diffuse Parenchymal Lung Disease Patients.

Complaints of Patients with DPLD	Frequency	Percentage
Breathlessness	20	32.3
Cough	13	21.0
Expectoration	11	17.7
Fever	14	22.6
Joint pains	4	6.5
Total	62	100.0

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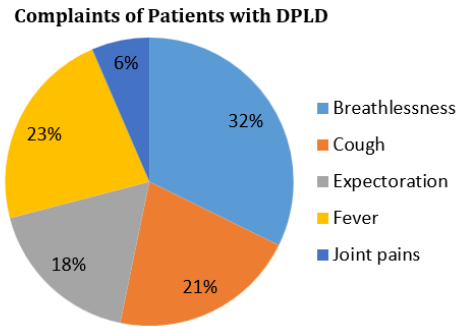

Table 5: Distribution of Radiological Profile among Diffuse Parenchymal Lung diseases Patients.

Radiological Profile of DPLD Patients	Frequency	Percentage
Reticular pattern	17	27.4
Reticulonodular	5	8.1
Honeycombing	16	25.8
Septal Thickening	15	24.2
Traction Bronchiectasis	9	14.5
Total	62	100.0

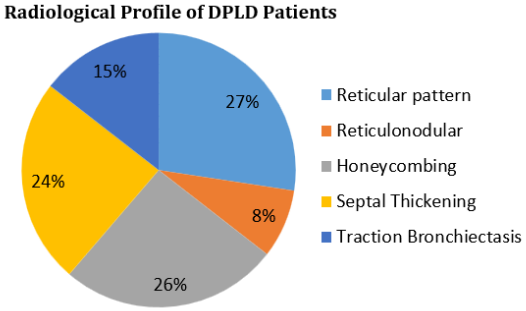

Table 6: Association between Aetiological with gender among Diffuse Parenchymal Lung disease patients.

Aetiological	Gender		Total
	MALE	FEMALE	
Metastasis	4	0	4
	9.1%	0.0%	6.5%
Pneumoconiosis	5	0	5
	11.4%	0.0%	8.1%
ABPA	6	0	6
	13.6%	0.0%	9.7%
COP	7	0	7
	15.9%	0.0%	11.3%
HP	3	0	3
	6.8%	0.0%	4.8%
Sarcoidosis	8	0	8
	18.2%	0.0%	12.9%
NSIP	4	0	4
	9.1%	0.0%	6.5%
CTD-ILD	7	3	10
	15.9%	16.7%	16.1%
IPF	0	15	15
	0.0%	83.3%	24.2%
Total	44	18	62
	100.0%	100.0%	100.0%
	Chi-Square = 51.808	**P-value = 0.001** HS**	

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Table 7: Association between Complaints with gender among Diffuse Parenchymal Lung disease patients.

Complaints of Patients with DPLD	Gender		Total
	MALE	FEMALE	
Breathlessness	19	1	20
	43.2%	5.6%	32.3%
Cough	13	0	13
	29.5%	0.0%	21.0%
Expectoration	11	0	11
	25.0%	0.0%	17.7%
Fever	1	13	14
	2.3%	72.2%	22.6%
Joint pains	0	4	4
	0.0%	22.2%	6.5%
Total	44	18	62
	100.0%	100.0%	100.0%
	Chi-Square = 52.882	**P-value = 0.001** HS**	

Table 8: Association between Radiological Profile with gender among Diffuse Parenchymal Lung disease patients.

Radiological Profile of DPLD Patients	Gender		Total
	MALE	FEMALE	
Reticular pattern	17	0	17
	38.6%	0.0%	27.4%
Reticulonodular	5	0	5
	11.4%	0.0%	8.1%
Honeycombing	16	0	16
	36.4%	0.0%	25.8%
Septal Thickening	6	9	15
	13.6%	50.0%	24.2%
Traction Bronchiectasis	0	9	9
	0.0%	50.0%	14.5%
Total	44	18	62
	100.0%	100.0%	100.0%
	Chi-Square = 44.527	**P-value = 0.001** HS**	

DISCUSSION

Our study aims to present data on the clinicopathological profile of patients with diffuse parenchymal lung disease (DPLD) from a tertiary care center in South India. The study includes 62 patients diagnosed with DPLD, providing valuable insights into their clinical and radiological characteristics. The majority of the patients, 31 (50%), were aged between 61 and 70 years, with a mean age of 59.16 ± 7.175 years (Table 1). This finding is consistent with a study by Deependra Kumar Rai et al. (2021), which reported a mean age of 52.7 ± 14.9 years. Additionally, the majority of patients, 44 (71%), were male (Table 2). Among the patients with diffuse parenchymal lung disease (DPLD), the most common etiology was Idiopathic Pulmonary Fibrosis (IPF), accounting for 15 cases (24.2%), followed by Connective Tissue Disease-associated Interstitial Lung Disease (CTD-ILD) in 10 cases (16.1%) (Table 3). This finding is consistent with the study by Yadav H and Srivastava R (2018), which reported that the most common Interstitial Lung Disease (ILD) is IPF, accounting for 40% of cases.

The most common complaint among the patients was breathlessness, reported by 20 patients (32.3%), followed by fever (14 patients, 22.6%), cough (13 patients, 21%), expectoration (11 patients, 17.7%), and joint pain (4 patients, 6.5%) (Table 4). These findings are consistent with those of Sandeep Gupta et al. (2023), who reported that shortness of breath was the most prevalent symptom (98%), followed by cough (84%).The most common radiological finding among patients with diffuse parenchymal

lung disease (DPLD) was a reticular pattern, observed in 17 patients (27.4%), followed by honeycombing in 16 patients (25.8%) (Table 5). This is consistent with the study by Arjun Khanna et al. (2019), which reported that the most common radiological profile was a reticular pattern (56%), followed by honeycombing (50%) A statistically significant association was found between etiology and gender among patients with diffuse parenchymal lung disease (DPLD), with a χ^2 value of 51.80 and a p-value of 0.001 (Table 6). Similarly, a significant association was observed between complaints and gender, with a χ^2 value of 52.88 and a p-value of 0.001 (Table 7). Additionally, a significant association was noted between radiological profile and gender, with a χ^2 value of 44.52 and a p-value of 0.001 (Table 8). These findings align with those of Ajai Kumar Tentu et al. (2018), who reported significant correlations between severe diffusion impairment and crackles ($p = 0.011$), severe diffusion impairment and honeycombing ($p < 0.001$), reduced lung volumes and crackles ($p = 0.0009$), and reduced 6-minute walk distance and honeycombing ($p < 0.001$) [9].

CONCLUSION

In conclusion, the findings of our study on Diffuse Parenchymal Lung Disease (DPLD) align with several retrospective studies conducted in India and globally. Idiopathic pulmonary fibrosis (IPF) emerged as the most commonly diagnosed DPLD in our cohort. Early detection of DPLD is crucial to prevent or delay irreversible damage, especially in treatable conditions such as Connective Tissue Disease-Associated Interstitial Lung Disease (CTD-ILD), Sarcoidosis, And Cryptogenic Organizing Pneumonia (COP), which can often be diagnosed through clinical and radiological features. Early detection is crucial for reducing morbidity and improving patient outcomes. To improve the understanding of the spectrum of DPLDs and their treatment options, larger prospective studies and increased education and awareness both among Physicians and Patients deserve special attention of paramount importance.

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