Section: Pulmonary Medicine

Original Article

ISSN (0): 2663-8290; ISSN (P): 2663-8282

Clinical Profile of Idiopathic Pulmonary Fibrosis

Mahesh NS[1], Sadanand C D[2], Durga Lawande[3]

[1]Assistant Professor, Department of TB and Chest Diseases, Akash Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, [2]Associate Professor, Department of Medicine, Akash Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, [3]Professor, Department of Pulmonary Medicine, Goa Medical college, Goa.

Abstract

Background: The incidence of IPF was estimated at 10.7 cases per 100,000 per year for men and 7.4 cases per 100,000 per year for women in a population-based study from the county of Bernalillo, New Mexico. A study from the United Kingdom reported an overall incidence rate of only 4.6 per 100,000 person-years, but estimated that the incidence of IPF increased by 11% annually between 1991 and 2003. This increase was not felt to be attributable to the aging of the population or increased ascertainment of milder cases. **Subjects and Methods:** This was an observational prospective study carried out in the Department of Pulmonary Medicine, Medical College. The study included 35 patients diagnosed with IPF during the two year study period. **Results:** Dyspnea was the most common symptom at presentation, being present in 35 (100 %) of the patients. Cough with or without expectoration was the next most common symptom, being present in 33 (94.2 %) of the patients. Other symptoms were chest pain, fever and weight loss, and joint pains. **Conclusion:** Clinical prediction models are used in many areas of medicine to provide accurate prognostic information and staging of disease; such a prediction model would be useful in IPF.

Keywords: Idiopathic Pulmonary Fibrosis, Interstitial Lung Diseases, Dyspnea.

Corresponding Author: Dr. Sadanand C D, Associate Professor, Department of Medicine, Akash Institute of Medical Sciences and Research Centre, Bangalore, Karnataka.

Received: October 2019
Accepted: October 2019

Introduction

Interstitial lung diseases (ILDs) are a heterogeneous group of more than 150 disease entities characterized by varying degrees of fibrosis and inflammation of the lung parenchyma or interstitium. The interstitium of the lung spans the region between alveolar epithelium and pulmonary vascular endothelium. This region includes a variety of cell types (fibroblasts, myofibroblasts, and macrophages) and matrix components (collagens, elastin, and proteoglycans). The interstitium extends from the alveolar space proximal to the terminal and respiratory bronchioles. However, for clinical purposes, some disorders that primarily affect the alveolar space (e.g., pulmonary alveolar proteinosis or cryptogenic organizing pneumonia) also typically fall under the heading of interstitial lung diseases. The classification, prognosis, and treatment of interstitial lung diseases evolve as our understanding of them improves.[1]

IPF is defined as a specific form of chronic, progressive fibrosing interstitial pneumonia of unknown cause, occurring primarily in older adults, limited to the lungs, and associated with the histopathologic and/or radiologic pattern of UIP.

The definition of IPF requires the exclusion of other forms of interstitial pneumonia including other idiopathic interstitial pneumonias and ILD associated with environmental exposure, medication, or systemic disease.[2]

The epidemiology of IPF is difficult to determine and the available data are of limited value. The epidemiology has been assessed by the large population studies. Studies from the United Kingdom and United States suggest that IPF is widely under-reported.

The incidence of IPF was estimated at 10.7 cases per 100,000 per year for men and 7.4 cases per 100,000 per year for women in a population-based study from the county of Bernalillo, New Mexico.[3] A study from the United Kingdom reported an overall incidence rate of only 4.6 per 100,000 person-years, but estimated that the incidence of IPF increased by 11% annually between 1991 and 2003. This increase was not felt to be attributable to the aging of the population or increased ascertainment of milder cases. A third study from the United States estimated the incidence of IPF to be between 6.8 and 16.3 per 100,000 persons using a large database of healthcare claims in a health plan.[4]

Prevalence estimates for IPF have varied from 2 to 29 cases per 100,000 in the general population. The wide range in these numbers is likely explained by the previous lack of uniform definition used in identifying cases of IPF, as well as by differences in study designs and populations. A recent analysis based on healthcare claims data of a large health plan in the United States yielded a prevalence estimate of between 14.0 and 42.7 per 100,000 persons depending on the case definition used.[5]

In India, this was earlier considered to be a rare disease. In 1979, Jindal et al published their data on 61 cases of DPLD

(Diffuse Parenchymal Lung Disease) seen over a period of five years.[23] However, the scenario is different now and the disease is no longer rare or uncommon. Recently the same centre published data on 76 patients with IPF diagnosed over a 16-month period showing a definite increase in the frequency of diagnosis.

A number of other publications from India have described various aspects of the disease. The increase in the number of studies from India may be a true reflection of the increase in the incidence or may be apparent because of increased awareness of the condition or due to better availability of diagnostic facilities like high-resolution CT and fibreoptic bronchoscopy.[6]

Subjects and Methods

This was an observational prospective study carried out in the Department of Pulmonary Medicine, Medical College. The study included 35 patients diagnosed with IPF during the two year study period.

ATS/ERS consensus statement published in 2011 states that:

The diagnosis of IPF requires the following:

1. Exclusion of other known causes of ILD (e.g., domestic and occupational environmental exposures, connective tissue disease, and drug toxicity).
2. The presence of a UIP pattern on HRCT in patients not subjected to surgical lung biopsy.
3. Specific combinations of HRCT and surgical lung biopsy pattern in patients subjected to surgical lung biopsy.

Inclusion Criteria

All patients who presented with features suggestive of IPF were subjected to radiological examination with chest radiograph and HRCT thorax.

Those patients whose HRCT thorax was reported as UIP pattern were included in the study. Surgical lung biopsy was not performed in any of the patients.

Exclusion Criteria

1. Patients with history of occupational environmental exposure, drug toxicity were excluded.
2. Patients with known connective tissue disease presenting with lung involvement were excluded.
3. HRCT thorax reported as findings inconsistent with IPF were excluded.

Informed consent was obtained from all the patients.

A pre-structured proforma was filled in those cases which were included in the study.

Results

Table 1: Shows sex distribution of cases of IPF

Sex	Number Of Patients	Percentage
Male	16	45 %
Female	19	54 %
Total	35	100 %

There was preponderance of females in study population. Of the 35 patients included in the study, 16 (45 %) were males and 19 (54 %) were females. Male to female ratio was 0.84.

Table 2: Shows age distribution of IPF

Age Group	Number	Percentage
40-49	5	14.2 %
50-59	7	20 %
60-69	16	45.7 %
70-79	7	20 %

Age of the patients included in the study varied from 42 to 79 years. Majority of the patients belonged to 60- 69 years age group. Mean age of the patients included in the study was 61.5 years. The youngest patient in the study was 42 years and the oldest patient was 79 years of age.

Table 3: Smoking history

Smoking Pack Years	Number	Percentage
0 (Non Smoker)	15	42.8%
<20 Pack years	10	28.5%
21-40 Pack years	6	17.1%
>41 Pack years	4	11.4%

Out of the 35 patients, 15(42.2%) patients were non smokers and 20(57.1%) patients were current or ex smokers. Smoking was more common in males (14 out of 20), compared to females (6 out of 20). Majority of the smokers had < 20 pack years smoking history.

Table 4: Shows occupations of patients

Occupation	No. Of Patients	Percentage
Farmer	1	2.8%
Manual Labourer	12	34.2%
Sedentary Worker	4	11.4%
Fishermen	1	2.8%
Housewives	17	48.5%
Total	35	100%

Majority of the patients were either housewives or manual labourers. Out of 35 patients, 17 (48.5 %) were housewives, and 12 (34.2 %) were manual labourers.

Table 5: Shows duration of symptoms

Duration Of Symptoms	No. Of Patients	Percentage
<6 Months	9	25.7%
6 Months - 1 Year	4	11.4%
>1 Year	22	62.8%
Total	35	100%

Duration of symptoms were <6months in 9(25.7%) patients, and 6months to 1 year in 4(11.4%) patents, and >1 year in 22(62.8%) patients. Mean duration of the symptoms was 15.1 months. Duration of symptoms ranged from 3 months to 36 months.

Table 6: Shows symptoms in IPF

Symptoms	No. of Patients	Percentage
Cough	33	94.2%
Dyspnea	35	100%
Chest Pain	5	14.2%
Hemoptysis	1	2.8%
Fever And Weight Loss	4	11.4%
Joint Pain	6	17.1%
Raynaud's Phenomenon	0	0%

Dyspnea was the most common symptom at presentation, being present in 35 (100 %) of the patients. Cough with or without expectoration was the next most common symptom, being present in 33 (94.2 %) of the patients. Other symptoms

were chest pain, fever and weight loss, and joint pains.

Table 7: Shows common signs found in the present study

Signs	No. Of Patients	Percentage
Tachypnea	31	88.5%
Clubbing	20	57.1%
Pedal Edema	3	8.5%
Velcro Crepitations	31	88.5%
Rhonchi	1	2.8%

On general examination, revealed findings like tachypnea, velcrocrepitations and clubbing. Tachypnea was seen in 31 (88.5%) patients. Velcro crepitations seen in 31(88.5%) patients. Clubbing was seen in 20 (57.1%) patients.

Table 8: Shows co morbid illnesses found in the present study

Co Morbid Illness	No Of Patients	Percentage
Old Pulmonary Tuberculosis	2	5.7%
Hypertension	12	34.2%
Diabetes Mellitus	9	25.7%
Ischemic Heart Diease	3	8.57%
Depression	2	5.7%
Seizure Disorder	1	2.8%
Gerd	14	40%

GERD was the commonest co morbid condition which was found in 14(40%) patients. The diagnosis was done on history basis. Hypertension was present in 12(34.2%) patients. Diabetes mellitus was seen in 9(25.7%) patients. Other conditions were ischemic heart disease, old pulmonary tuberculosis depression and seizure disorder. 5(14.2%) patients had both hypertension and diabetes mellitus. 3(8.5%) patients had hypertension, diabetes and IHD.

Discussion

In the present study, out of 35 patients, 16(45%) were males, and 19(54%) were females. Female sex preponderance was noted with M: F ratio of 0.84.

The male to female ratio of patients with IPF has varied in different studies. The present study shows male: female ratio of o.84 which is similar to that reported by maheshwariet al.[7]

Rasulet al[8], reported male: female ratio of o.45, may be due to small size of the study population. Other studies show male to female ratio of >1. Our study shows slight female preponderance, however further studies with larger sample size is required to find out if this finding is true.

IPF is commonly seen in the middle-aged patients, and the incidence advances with increasing age. Approximately two-thirds of patients with IPF are over the age of 60 yr at the time of presentation, with a mean age at diagnosis of 66 years.

In one study, incident cases tended to be older than prevalent cases. Prevalence for adults 35 to 44 yr was 2.7 per 100,000; by contrast, prevalence exceeded 7.5 per 100,000 for individuals older than 75 years.

In the present study, 23 (65.7%) patients were aged above 60 years.In the present study the highest number of patients, i.e. 16 patients, belonged to age group of 60- 69 years.

The mean age of patients in the present study was 61.5years, which is comparable to the other studies listed above, where in the mean age was found to vary between 50- 65 years .The present study closely resembles Cherniack et al[9] and Bjoraker et al[10] where the mean age was 62 years and 61.7 years.

The present study showed a smoker: non smoker ratio of 1.33 in patients of IPF, which is comparable to that seen in other mentioned studies. This ratio has varied in different studies. Rasulet al[8] has reported ratio as low as 0.10. This study was conducted in Lahore, Pakistan, may be attributed to the cultural and behavioral aspects of that population.

In the present study the both beedi and cigarette smokers were included. Beedi smoking is common among patients of low socio-economic status. Mostly patients with lower socio-economic status use our facility as it is a government hospital. Also, they are more easily available as they are manufactured locally.

In case-control studies, cigarette smoking has been identified as a potential risk factor with the odds ratio (OR) from various regions of the world ranging from 1.6 to 2.9 for the development of IPF in ever smokers. The odds of developing IPF increased with the pack-years of smoking in a study from the United Kingdom, but this effect was not significant; while a study in the United States revealed that those with a history of smoking for 21 to 40 pack-years had an OR of 2.3.

Smoking is strongly associated with IPF, particularly for individuals with a smoking history of more than 20 pack-years. This applies to familial as well as sporadic IPF.

In the present study, out of the 20 smokers, 10 patients had >20 pack years smoking history.

In the present study, dyspnea was the most common symptom at presentation, being present in 35 (100 %) of the patients. Cough with or without expectoration was the next most common symptom, being present in 33 (94.2 %) of the patients. Other symptoms were chest pain, fever and weight loss, and joint pains.

All the studies demonstrate that cough and dyspnea are the most common presenting complaints in a patient with IPF. Systemic complaints such as fever and weight loss were seen in 4(17.1%) of the patients. Similar finding is observed in studies of katzenstein et al[11], and guerry-force et al[12], who demonstrated fever fatigue weight loss and arthralgias 13% and 17% respectively. 6(17.1%) patients had joint pains, but other symptoms suggestive of connective tissue disease were absent.

IPF usually presents insidiously, with the gradual onset of a nonproductive cough and dyspnea. Dyspnea is usually the most prominent and disabling symptom. It is usually progressive and in most patients it is reported to have been present for > 6 mo before presentation.

The mean duration of the symptoms in the present study was 15.1 months, which is comparable with the other studies. Duration of symptoms in the present study ranged from 3 months to 36 months.

Duration of symptoms were <6months in 9(25.7%) patients, and 6months to 1 year in 4(11.4%) patents, and >1 year in 22(62.8%) patients. Duration of symptoms ranged from 3 months to 36 months.

On physical examination, crackles are detected on chest auscultation in more than 80% of patients. These are typically “dry,” end-inspiratory, and “Velcro” in quality, and are most prevalent in the lung bases. With progression of the disease, rales extend toward the upper lung zones. Clubbing is noted in 25 to 50% of patients.

Patients with IPF are tachypneic; they develop more rapid

shallow breaths as the disease progresses, and therefore the work of breathing is increased. This rapid respiratory rate is felt to be secondary to altered mechanical reflexes, because of the increased elastic load and/or vagal mechanisms, since no defined chemical basis for the hyperventilation has been identified.

In the present study 31(88.5%) patients were found to have tachypnea at initial evaluation.

In the present study, commonly elicited signs are tachypnea (88.5%), Velcro crepitations (88.5%) and clubbing(57.1%).

Conclusion

The spectrum and clinical presentation of IPF in India is largely similar to that in the West. IPF is a fatal lung disease; the natural history is variable and unpredictable. Most patients with IPF demonstrate a gradual worsening of lung function over years; a minority of patients remains stable or declines rapidly. Some patients may experience episodes of acute respiratory worsening despite previous stability.

Despite the numerous individual predictors of survival in idiopathic pulmonary fibrosis that have been identified in the last several decades, it is not clear how these predictors should be collectively used to predict clinical course or to stage disease.

References

1. Nathan SD. Lung transplantation: disease-specific considerations for referral. Chest. 2005;127:1006-16.
2. Trulock EP, Edwards LB, Taylor DO, Boucek MM, Keck BM, Hertz MI. Registry of the International Society for Heart and Lung Transplantation: twenty-third official adult lung and heartlung transplantation report -2006. J Heart Lung Transplant. 2006;25:880-92.
3. Michael A. Nead, David G. Morris. Interstitial lung disease: a clinical overview and general approach. In: Fishman's pulmonary diseases and disorders, 4th ed. McGraw Hill 2008;1:1103-24.
4. Hamman, L., and A. Rich. Acute diffuse interstitial fibrosis of the lung. Bull. Johns Hopkins Hosp .1944;74:177-12.
5. Liebow, A. A. Definition and classification of interstitial pneumonias in human pathology. Prog. Respir. Res.1975;8:1-31.
6. Anna-luise a. katzenstein and jeffrey l. myers Idiopathic Pulmonary Fibrosis Clinical Relevance of Pathologic Classification Am J RespirCrit Care Med; 1998 Vol 157. pp 1301-15.
7. Maheshwari U, Gupta D, Aggarwal A.N, Jindal S.K. Spectrum and diagnosis of Idiopathic pulmonary fibrosis. Indian T.Chestdis Allied Sci. 2004; 46: 23-26.
8. Rasul S, Khalid M.C, Imran N, Khan S.U, Younus M. Gender Differences in Clinical Presentation of Idiopathic Pulmonary Fibrosis at Lahore, Pakistan. Annals 2010; 16: 286-89.
9. Cherniack, R. M., T. V. Colby, A. Flint, W. M. Thurlbeck, J. A. Waldron, Jr., L. Ackerson, M. I. Schwarz, and T. E. King, Jr. Correlation of structure and function in idiopathic pulmonary fibrosis. Am.J. Respir. Crit. Care Med.1995;151:1180–88.
10. Bjoraker, J. A., J. H. Ryu, M. K. Edwin, J. L. Myers, H. D. Tazelaar, D. R. Schroeder, and K. P. Offord. Prognostic significance of histopathological subsets in idiopathic pulmonary fibrosis. Am. J. Respir.Crit. Care Med.1998;157:199-203.
11. Katzenstein, A.-L. A., J. L. Myers, W. D. Prophet, L. S. Corley, III, and M. S. Shin. Bronchiolitis obliterans and usual interstitial pneumonia: a comparative clinicopathologic study. Am. J. Surg. Pathol. 1986;106: 373-81.
12. Guerry-Force, M. L., N. L. Muller, J. L. Wright, B. Wiggs, C. Coppin, P. D. Pare, and J. C. Hogg.A comparison of bronchiolitis obliterans with organizing pneumonia, usual interstitial pneumonia, and small airways disease. Am. Rev. Respir. Dis.1987;135:705-12.

How to cite this article: Mahesh NS, Sadanand C D, Lawande D. Clinical Profile of Idiopathic Pulmonary Fibrosis. Acad. J Med. 2019;2(2):86-89.

DOI: dx.doi.org/10.21276/ajm.2019.2.2.22

Source of Support: Nil, **Conflict of Interest:** None declared.