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Clinical Pattern of Idiopathic Pulmonary Fibrosis: A Retrospective Study

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ABSTRACT

Background: *IPF is the most common form of interstitial lung disease. IPF is a clinico-pathological syndrome characterized by cough, exertional dyspnea, basilar crackles, a restrictive pattern on pulmonary function test (PFT) and honey comb pattern on HRCT. Since there are no exact data on IPF in Iranian patients and also the controversy that exist in this regard we decided to study the IPF cases in regard to epidemiologic, clinical features, radiologic manifestations and diagnosis in Masih Daneshvari Hospital during 1998-2001.*

Materials and Methods: *This study was a descriptive retrospective study on files of IPF patients in Masih Daneshvari Hospital during 1998-2001. Although the total number of patients was 98, only 50 cases that had clinical and pathological findings compatible with IPF were included in the study.*

Results: *Twenty-seven (54%) were males and 23 (46%) were females. Mean age was 56.25±15.86 yrs. The most common clinical signs and symptoms were dyspnea (100%), cough (90%) and crackle (90%). HRCT findings were abnormal in all patients. Eighteen percent were smokers and the most common occupational exposure was through agriculture. 82.2% of patients had restrictive pattern on PFT. Seventy percent of patients had transbronchial lung biopsy (TBLB), 26% had open lung biopsy (OLB) and 4% had video-assisted thoracoscopy (VATS).*

Conclusion*: Age of patients with IPF in our study is one decade lower than in Western countries. HRCT and TBLB assist significantly in the diagnosis of IPF and limiting the surgical procedures to only a limited number of cases.* ***(Tanaffos 2006; 5(2): 27-32)***

Key words: *Idiopathic pulmonary fibrosis, High resolution Computerized Tomography, Trans-bronchial lung biopsy*

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INTRODUCTION

Interstitial lung diseases (ILD) consist of a group of complex diseases, including more than 200 diseases (1), the commonest being idiopathic pulmonary fibrosis (IPF) (2, 3).

In general, IPF is a chronic disorder of unknown cause. It results in progressive respiratory failure and death. In the pathogenesis of IPF, there is a continuous acute injury to the lung leading to fibrosis, destruction of pulmonary structure and loss of pulmonary function (4, 5). IPF is differentiated from other causes of diffuse pulmonary fibrosis by the histologic pattern of usual interstitial pneumonia (4).

Based on the recent hypothesis on the pathogenesis, there is frequent injury to the epithelium and basal membrane, stimulation of inflammatory cells, release of cytokines and pro-inflammatory chemokines and response of fibroblasts (6).

IPF is a clinico-pathologic syndrome presenting with cough, exertional dyspnea, basilar crackles, restrictive pattern on pulmonary function test and honey comb pattern on HRCT (3, 6). Disease progression is slow but continuous. The present therapeutic measures are ineffective and majority of the patients expire within 3-8 yr from the onset of symptoms due to respiratory failure (6).

The golden diagnostic criteria for IPF are usual interstitial pneumonia (on histological examination) and clinical features. There is still controversy in regard to open lung biopsy in all suspected cases of IPF (3, 7, 8). Since there are no exact data on IPF in Iranian patients and also the controversy that exists in this regard we decided to study the IPF cases in regard to epidemiologic, clinical features, radiologic manifestations and diagnosis in Masih Daneshvari Hospital during 1998-2001.

MATERIALS AND METHODS

This was a descriptive retrospective study on files of IPF patients in Masih Daneshvari Hospital during 1998-2001. Although the total number of patients was 98, only 50 cases that had clinical and pathologic findings compatible with IPF were included in the study.

Initially a questionnaire containing questions related to medical files was prepared. It included data such as: age, sex, clinical presentation, radiologic manifestation, occupational exposure, pulmonary function test, severity of pulmonary dysfunction based on American Thoracic Society (ATS) criteria and histologic examination.

RESULTS

A total of 50 patients were included in the study. There were 23(46%) females and 27 (54%) males. The patients were grouped in different age groups (based on every 10 yrs). Maximum number of patients were between 70-79 yrs of age and minimum number of them were in 80-89 yrs of age and 20-29 yrs of age. Mean age (±SD) was 56.25±(15.86) yrs. Mean age (±SD) in females and males was 60.3±13.98 yrs and 52.8±17.45 yrs respectively.

From the clinical point of view, the commonest clinical manifestation was dyspnea (100%), followed by cough (90%) and crackles (90%) (Table 1).

Table 1. Frequency of clinical manifestations in IPF patients

Clinical symptoms	Frequency	Percentage (%)
Dyspnea	50	100
Cough	45	90
Weight loss	28	56
Orthopnea, PND	22	44
Chest pain	16	32
Edema	10	20
Hemoptysis	4	8
Clinical signs		
Crackles	45	90
Tachypnea	29	58
Cyanosis	16	32
Clubbing	15	30

On HRCT, 100% of patients demonstrated abnormal presentation. The commonest abnormality was reticular pattern (42%) followed by honey comb patterns (30%) (Table 2).

Table 2. Different patterns of HRCT in IPF patients

HRCT Patterns	Frequency	Percentage (%)
Reticular pattern	21	42
Honey comb	15	30
Ground glass	3	6
Reticulo-nodular	8	16
Increased pleural thickening	8	16
Lymphadenopathy	7	14
Normal	0	0

In regard to occupation and environmental exposure, the commonest occupation was farming (18%) and 18% had a history of smoking (Table 3).

Table 3. Frequency of occupation and/or environmental exposure in IPF patients.

Occupation or Environmental exposure	Absolute frequency	Percentage (%)
Farming	9	18
Cigarette smoking	9	18
History of baking	7	14
Contact with metal dust	4	8
Contact with chemicals	1	2
Contact with dust	3	6
Contact with Asbestos	1	2
Indefinite contact	16	32

In regard to pulmonary function tests, 82.2% had restrictive pattern on PFT. Severity scale of pulmonary dysfunction based on ATS criteria included: restrictive mild (3.5%), moderate (14.3%), moderately severe (21.4%), severe (21.4%), very severe (21.4%), and mixed pattern (obstructive-restrictive) (17.8%).

Mean (±SD) Hb was 14.11±1.85 mg/dl, and mean (±SD) ESR was 19.22±14.81. Also echocardiography demonstrated increased pulmonary artery pressure in 20 patients (40%); mean (±SD) was 64.6±20.7.

In regard to methods of biopsy: transbronchial biopsy was performed in 70%, open lung biopsy in 26%, and video assisted thoracoscopic biopsy in 4%. From pathologic point of view, all patients had UIP (usual interstitial pneumonia) pattern on microscopy.

DISCUSSION

IPF is characterized by interstitial pulmonary infiltration especially in bases of lungs on radiography, progressive dyspnea and loss of pulmonary function (5). The disease is more prevalent in males than females (9- 11).

It usually appears during 5^{th} and 6^{th} decades (5). About 70% of patients are above 60 yr when diagnosed and mean age at the time of diagnosis was 66 yr (10, 12- 14). Mean age in our study groups was 56 yr; it was a decade less than that of Western countries. However, it is compatible with the mean age of IPF patients in developing countries (15, 16). The important point in our research was that the mean age of our female patients at the time of diagnosis was a decade higher than our male patients (60 yr versus 52 yr). This could be due to delay in diagnosis, occupational exposure, and/ or cigarette smoking in males.

Considering the role of risk factors in IPF, smoking is regarded as the most important factor with OR of 1.6-2.9 in different regions of the world (9, 12, 17). In most reported articles up to 75% of IPF patients were smokers (18, 19). However, this rate in our study was about 18%, a rate which was lower than other statistics (2, 5, 16).

In addition to cigarette smoking, other factors included were farming and working in industrial environments. However, a specific pneumoconiosis

has not yet been identified (10, 12, 17). In our study, in addition to cigarette smoking, farming (18%) and baking (14%) constituted the highest occupational and environmental exposures. Overall 68% of the cases mentioned environmental and occupational exposures, while in 32% there was no history of contact.

Considering the clinical features, most patients usually complain of dry cough and exertional dyspnea (3, 14, 15). Also on pulmonary auscultation, crackles are heard in more than 80% of the patients (5, 20). This pattern was similar to our study, in other words dyspnea, dry cough and crackles were detected in 100%, 90% and 90% of our study patients respectively. In different studies clubbing occurred in 20-25% of the cases (14, 21). In this research clubbing was detected in 30% of patients. Meanwhile, cyanosis and cor pulmonale were observed at the end stages of disease (13, 21, 22).

We detected increased pulmonary artery pressure in 40% on echocardiography pointing towards the progressive form of disease at the time of diagnosis (5, 20).

HRCT changed the diagnostic evaluation of IPF (23, 24). HRCT not only accelerated IPF diagnosis but also shortened the list of differential diagnosis (23, 25). Similar to other researches, we observed abnormal patterns on HRCT (reticular pattern being the most frequent picture) in all patients.

As it was expected PFT demonstrated restrictive pattern in majority of patients (5, 26). In other words 82.2% had restrictive PFT pattern while the remaining had a mixed pattern (obstructive-restrictive); which could be explained by the effect of smoking on lung function.

In regard to the method of sampling, lung biopsy, either by open method or VATS (video assisted thoracoscopic lung biopsy), was the best method of obtaining biopsy for IPF diagnosis (27, 28).

However, the surgical method of sampling is less frequent. In a study conducted on 200 IPF patients from England, open lung biopsy was performed only in 7.5% of the patients. Majority of patients were diagnosed by clinical presentation (29). Similar reports have been reported from the USA and other countries (30, 31).

On the other hand, TBLB is suitable for diagnosing diseases present in the list of IPF differential diagnosis; however, it is inappropriate for IPF diagnosis (32). In contrast to other studies e.g. a study conducted in England in which only 32% had TBLB and 7.5% underwent open lung biopsy (29), our methods of sampling were transbronchial (70%), open lung biopsy (26%) and VATS (4%); in other words all patients had pathologic specimens. Meanwhile, HRCT and clinical presentation can detect 70% of IPF cases accurately (33, 34). Therefore, in regard to IPF diagnosis, our study was more accurate as compared to other studies.

CONCLUSION

IPF compared to other ILD has a poorer prognosis. In this study, it was shown that the incidence of IPF in our study patients was a decade sooner than Western countries being similar to regional countries such as India and Kuwait. This fact necessitates the rapid diagnosis and thus treatment because the majority of the active individuals in our society are at this age group. HRCT and TBLB assist significantly in the diagnosis of IPF. Surgery is only saved for cases in which we do not reach diagnosis through clinical, pathologic, HRCT, and TBLB findings and the patients have no contraindication for surgery.

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