Clinical impact of a multidisciplinary discussion group on the diagnosis of idiopathic pulmonary fibrosis in Colombia

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Abstract

Introduction: idiopathic pulmonary fibrosis (IPF) is an interstitial lung disease (ILD) with a poor prognosis, considered an orphan disease in Colombia. An accurate diagnosis has implications for the patient and healthcare costs. Multidisciplinary discussion groups (MDGs) are considered the gold standard for diagnosis. There are no prior studies in Colombia on the experience of an MDG.

Objectives: to evaluate the impact of an MDG in a quaternary care institution in Bogotá on the change in the diagnosis of patients with ILD and the concordance between the initial and final diagnosis of IPF.

Materials and methods: patents with ILD evaluated from 2015-2018 by the MDG made up of pulmonologists, a radiologist, a pathologist and rheumatologists. The ATS/ERS/JRS/ALAT diagnostic criteria for IPF. A description of changes in the diagnosis and the agreement between the initial diagnosis and the MDG diagnosis of IPF.

Results: out of 165 patients with ILD, the diagnosis was changed in 32.5%. The MDG confirmed IPF in 77.3% of patients with an initial diagnosis of ILD and 6.7% of those with a different initial diagnosis. When IPF was ruled out, the main diagnoses were chronic hypersensitivity pneumonitis (24.8%) and nonspecific interstitial pneumonia (23.5%). The Kappa index between the initial and final IPF diagnoses was 0.71 (0.60-0.82).

Conclusions: the MDG on ILD had a significant clinical impact evidenced by a high percentage of change in the referral diagnosis. The initial diagnosis of IPF was ruled out in a significant percentage of patients and confirmed in a smaller group which did not have this initial clinical suspicion. **(Acta Med Colomb 2022; 47. DOI: https://doi.org/10.36104/amc.2022.2017).**

Key words: *idiopathic pulmonary fibrosis, interstitial lung disease, multidisciplinary discussion, orphan disease, diagnosis, hypersensitivity pneumonitis*.

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Introduction

Interstitial lung disease (ILD) includes more than 150 conditions that may have similar signs, symptoms and radiological presentations, but a different clinical approach and prognosis, requiring a correct diagnosis and treatment. Interstitial lung disease may be divided into conditions with an underlying disorder (such as collagen diseases) or a known exposure (hypersensitivity pneumonitis, asbestosis, silicosis), and idiopathic interstitial pneumonias (IIPs) (1, 2).

The IIPs are a heterogenous group of diseases with diverse courses and prognoses, with idiopathic pulmonary fibrosis (IPF) being the most common and having the worst prognosis. Idiopathic pulmonary fibrosis is a specific form of chronic progressive fibrosing interstitial pneumonia of unknown etiology which occurs mainly in older adults, is limited to the lungs, and is associated with the histopathological or radiological pattern of usual interstitial pneumonia (UIP) (3). The natural history is a progressive decline in pulmonary function until death from respiratory failure or secondary to comorbidities, with a mean survival of three to five years from diagnosis (1, 2, 4, 5).

Since 2002, the international scientific societies have recommended an integrated and dynamic approach to diagnosing IIPs in multidisciplinary discussion groups (MDGs) including pulmonologists, radiologists and pathologists (1-3, 6). The MDG's diagnosis is associated with higher levels of diagnostic confidence and better interobserver agreement compared with each individual group component, and thus

is considered the "gold standard" for diagnosing ILD (3, 6-9). Although the yield of the MDGs may be evaluated in terms of diagnostic precision, the participants' experience and cost-effectiveness studies, diagnostic agreement is accepted as a substitute for diagnostic precision (10).

Idiopathic pulmonary fibrosis is accepted as an orphan disease in Colombia (11) and its accurate diagnosis has implications for the patient and for healthcare costs. As there are no studies in Colombia, our objective was to evaluate the impact of an MDG in a quaternary care institution in Bogotá on the change in diagnosis of patients with ILD and IPF.

Materials and methods

Patients and diagnostic criteria

All patients with ILD evaluated by the MDG between January 2015 and 2018 were included consecutively. The American Thoracic Society (ATS) and European Respiratory Society (ERS) criteria were used for diagnosing and classifying the ILDs (1, 2), and the joint criteria of the ATS, ERS, Japanese Respiratory Society (JRS) and Latin American Thoracic Society (ALAT) were used for diagnosing IPF (3). This study was approved by the institutional Ethics and Research Committee and all patients signed consent for clinical information use.

Muldisciplinary discussion group

The MDG was created in 2014 according to the international guideline recommendations (3, 6, 12). It is composed of medical specialists in pulmonology, radiology, pathology and rheumatology with experience in ILD, and meets two to four times per month. The medical chart is reviewed, looking especially for risk factors for pulmonary disease, environmental exposure, and possible systemic illness. At a minimum, there must be ILD-related immunological tests, pulmonary function tests (spirometry and carbon monoxide diffusion) and a chest tomography performed within the last three months. Complementary tests such as arterial gases, the six-minute walking test, prior tomographies for comparison or bronchoscopy results are also presented. If there are pulmonary biopsies, the pathology findings are reviewed. If new tests are ordered by the MDG, a new presentation is conducted to determine the final diagnosis. The attending physician´s diagnosis prior to the MDG is recorded, along with the definitive consensus diagnosis.

Statistical analysis

The percentage change in the diagnosis of overall ILD and IPF was described. The clinical and functional characteristics of IPF patients were described using averages and standard deviation for quantitative variables and proportions for qualitative variables. For IPF, the concordance between the diagnosis prior to the MDG and the definitive diagnosis by the MDG was evaluated using the kappa coefficient, as is customary in this type of studies. The SPSS 15.0 statistical software was used.

Results

A total of 165 patients with ILD were included, 55.2% of whom were males, with an average age of 69.0 ± 12.4 years. The frequency of the MDG referral diagnoses is shown in Table 1.

The MDG changed the diagnosis in 58 of the total 165 patients evaluated for ILD (35.2%), and in 17 of the 75 (22.7%) who had an initial diagnosis of IPF. In six of the 90 patients (6.7%) without an initial diagnosis of IPF, this diagnosis was confirmed by the MDG. The most common final diagnoses were IPF, connective tissue disease-associated interstitial lung disease (CTD-ILD), chronic hypersensitivity pneumonitis (HSP) and nonspecific interstitial pneumonia (NSIP) (Figure 1).

The concordance between the initial and final MDG diagnosis of IPF using the kappa index was 0.71 (0.60-0.82) (Table 2). Of the 165 patients, 64 (38.8%) had a final diagnosis by the MDG of IPF. In the 17 patients in whom

Table 1. *ILD MDG referral diagnoses (N=165).*

Age, years	69.0 ± 12.4
Males, %	91 (55.2)
• MDG referral diagnoses:	
• Idiopathic pulmonary fibrosis	75 (45.5)
• Nonspecific interstitial pneumonia	29 (17.6)
• Collagen disease-associated ILD	22 (13.3)
• Hypersensitivity pneumonitis	12 (7.3)
• Sarcoidosis	6 (3.6)
• Organizing pneumonia	3 (1.8)
• Lymphoid interstitial pneumonia	3 (1.8)
• Pneumoconiosis	3 (1.8)
• Drug-induced pneumonitis	3 (1.8)
• Pulmonary ossification	3 (1.8)
• Others	8 (4.8)

MGD: multidisciplinary discussion group.
Values given as average ± SD or N (%).

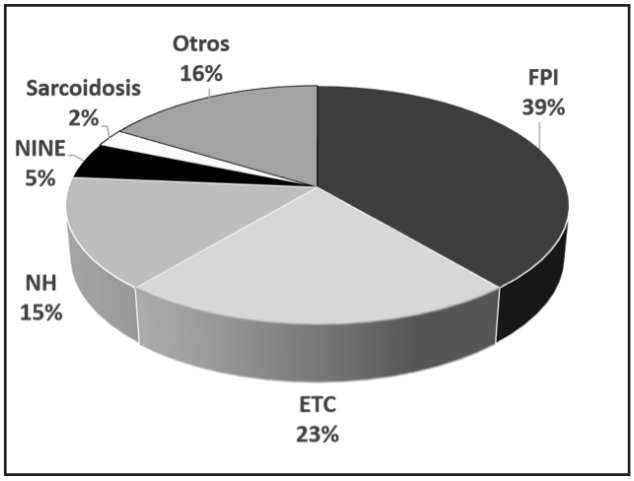

Figura 1. *Diagnósticos finales por el GDM. GMD: grupo de discusión multidisciplinaria; NINE: neumonía intersticial no específica: NH: neumonitis de hipersensibilidad; ETC: enfermedad pulmonar intersticial asociada a enfermedad del tejido conectivo.*

Table 2. *Agreement between the initial diagnosis and final MDG diagnosis.*

		MDG Diagnosis		Total
		IPF	No IPF	
Initial diagnosis	IPF	58	17	75
	No IPF	6	84	90
Total		64	102	165

MGD: multidisciplinary discussion group; IPF: idiopathic pulmonary fibrosis. Kappa=0.71 (0.60-0.82).

Table 3. *Characteristics of patients with IPF (N=64).*

Age, years	68.4 ± 10.9
Males	48 (75.0)
BMI, kg/m^2	26.8 ± 4.1
Smoking	47 (73.4)
Lung biopsy	13 (20.3)
FVC, % predicted	76.0 ± 17.2
FEV_1, % predicted	78.8 ± 18.3
FEV_1/FVC	82.0 ± 8.7
LD_{CO}, % predicted	50.8 ± 13.9
$PaCO_2$, mmHg	34.5 ± 3.8
PaO_2, mmHg	53.4 ± 9.3
SaO_2, %	87.2 ± 5.3
$P(A\text{-}a)O_2$, mmHg	16.0 ± 8.3

IPF: idiopathic pulmonary fibrosis. BMI: body mass index; FVC: forced vital capacity; FEV_1: forced expiratory volume in the first second; LD_{CO}: carbon monoxide diffusion; $PaCO_2$: partial pressure of carbon dioxide; PaO_2: partial pressure of oxygen; SaO_2: arterial oxygen saturation: $P(A\text{-}a)O_2$: alveolar-arterial oxygen gradient. Values given as average ± SD or N (%).

IPF was ruled out, the most common final diagnosis was chronic hypersensitivity pneumonitis in five (29.4%), NSIP in four (23.5%) and unclassifiable interstitial pneumonia (UIP) in three (17.6%).

Patients with a final MDG diagnosis of IPF were mostly males (75.0%) with a history of smoking (75%). A pulmonary biopsy was performed on 13 of these 64 patients (20.3%). Functionally, they had decreased forced vital capacity and carbon monoxide diffusion, hypoxemia and a high alveolar-arterial oxygen gradient (Table 3).

Discussion

This ILD-focused MDG had a significant clinical impact shown by the change in diagnosis of a high percentage of evaluated patients. Specifically for IPF, this diagnosis was ruled out in a significant percentage of patients and confirmed in a smaller group without this initial clinical suspicion, which entails a change of medical conduct for the appropriate care of these patients.

Previous studies have shown that the MDG changes the diagnosis in a high percentage of cases. A study in two ILD specialized centers which included 90 patients reported a change in the ILD diagnosis in 53% of all cases and in 37% of patients referred with an IPF diagnosis (13). In another study, the MDG reached an accurate diagnosis in 88% of the cases and the diagnosis was changed in 58 patients (64%) (14). In a retrospective study of 938 cases, the MDG reached a definitive diagnosis in 80.5% of the cases and the diagnosis was changed in 41.9% (15).

In this study, we showed that the MDG changed the diagnosis in 35% of the cases which, while high, was less than what is reported in the literature (13-15); and that the concordance between the diagnosis prior to the MDG and the final MDG diagnosis was not so low (0.71). This lower percentage change in the diagnosis, and the concordance shown, could be explained by the fact that the diagnosis prior to the MDG was made by a pulmonologist rather than by internal medicine or general physicians, as in several of the mentioned studies.

In the total ILD group, the most common final MDG diagnoses were IPF, CTD-ILD and HSP, similar to what has been described in large studies (9, 16). Both CTD and HSP are differential diagnoses of IPF, and it is recommended that these conditions be ruled out during the evaluation of patients with suspected IPF (3, 6, 16, 17). In 3.6% of the patients in our study, the final diagnosis was UIP, less than the 5-15% reported in other studies (9, 18). Unlike other ILD series, in this study we had few pneumoconiosis cases, which is explained by the fact that, in our institution, these patients are presented to the Occupational Pulmonology Board rather than the ILD MDG.

In a high percentage (22.7%), the initial diagnosis of IPF was ruled out, which has a high impact on the prognosis, clinical and therapeutic approach and, therefore, the health-care costs of these patients. Idiopathic pulmonary fibrosis is a disease with a high health and cost burden (19, 20) and a multidisciplinary approach to these patients with a more precise and early diagnosis is known to lead to better clinical outcomes (13, 21, 22).

In the Latin American context, with social, economic and healthcare system differences between our countries, the importance of applying the IPF guidelines is recognized. The importance of strengthening MDGs and ILD reference centers has been highlighted, recognizing that the diagnostic yield of these diseases is determined by the experience of these medical groups, which should ultimately lead to an optimization of healthcare resources and the rational use of high-cost treatments for these diseases (23).

In the 17 patients in whom the IPF diagnosis was ruled out, the most common final diagnoses were HSP (29.4%) and nonspecific interstitial pneumonia, as reported previously. It is important to highlight that three (17.6%) of these

patients in whom IPF was ruled out had a final diagnosis of UIP, despite complete imaging studies, an exhaustive history of exposure and complementary studies to rule out CTD.

As has been described in other studies, the patients with a final MDG diagnosis of IPF were mainly males, with a history of smoking, and a characteristic functional behavior of decreased forced vital capacity and carbon monoxide diffusion, as well as hypoxemia. The performance of a lung biopsy in 20.3% of the patients was similar to what was described in the pivotal studies with which pirfenidone and nintedanib were approved for use in IPF (24, 25) and is in line with the international recommendations which state that, in the presence of a suggestive clinical picture, a chest tomography can be used to diagnose the disease (3, 6).

The composition of our MDG is similar to what has been suggested and reported in the literature (3, 6, 26). In a survey of 10 expert ILD centers in Europe, North America and Australia, 100% of the groups reported pulmonologists, radiologists and pathologists in attendance (27). In this same survey, the attendance of rheumatologists was only reported in 30% of these centers. In another study involving more centers, the attendance of the radiologist and pulmonologist was a common characteristic of all the groups, while the attendance of the rheumatologist and pathologist was more probable in academic center groups (28).

Although several articles consider that rheumatologists should participate more in the clinical evaluation of the patients and not directly in the MDGs, some studies highlight the importance of their participation in the MDGs. Expert groups have reported making new CTD-ILD diagnoses in approximately 10% of the patients (9), reclassifying patients initially considered to have IPF, or needing fewer additional invasive tests once the diagnosis of a possible CTD has been determined (29-31). In our experience, 15 new CTD-ILD diagnoses were made, and the CTD-ILD diagnosis was the second most frequent definitive diagnosis (22.4%) after IPF, highlighting the importance of including a rheumatologist in the diagnosis of these diseases.

Comparing the organization and structure of our MDG, we have similar characteristics to other multidisciplinary groups. That is, it is an exclusive group for ILD cases, meeting once or twice a week for 60 minutes each time, and requiring that case presentations include a minimum of a chest tomography, pulmonary function tests, blood tests for CTD studies, or lung biopsies or bronchoalveolar lavage, if needed (27).

Although MDGs are thought to be the "gold standard" for diagnosing ILD, the performance of these groups has some limitations. A study evaluating interobserver agreement on tomography criteria for UIP using the scientific societies' guidelines (3) reported only moderate agreement among the radiologists, regardless of their level of experience (32). It has also been shown that physicians with more experience at academic centers have a greater agreement in the diagnosis of IPF than those at nonacademic centers (33). Additionally, the degree of agreement in diagnosing IPF is reportedly greater than that of other common diseases such as HSP and NSIP, conditions which are often included in the differential diagnosis along with IPF (9).

As a strength of this study, we point out that it is the first paper showing the experience of an MDG on ILD in Colombia, with a high percentage of changes in diagnosis, which has a high clinical impact on the management of these patients. Our MDG has a clearly defined structure including professionals from different medical specialties with expertise in the approach to ILD patients and a minimum requirement for case presentations which allows the complete study of the patients. As ILD, and especially IPF, are low-prevalence diseases, we believe that the study sample is significant and supports the conclusions reached in the study.

The main weakness, similar to what has been reported in the literature on MDGs, is the lack of verification of the MDG results, which would require medium and long-term follow up of the patients with clinical outcomes to better confirm the final MDG diagnoses. In addition, it is important to perform cost studies to determine the economic outcome of the changes in diagnosis and management of these patients, which was not assessed in this paper.

In conclusion, our MDG had a significant clinical impact shown by a change in diagnosis of a high percentage of ILD patients evaluated. Specifically for IPF, this diagnosis was ruled out in a significant percentage of patients and was confirmed in a smaller group without this initial clinical suspicion, which entails a change in medical treatment for the appropriate care of these patients.

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