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ORIGINAL ARTICLE

Study of the relationship of dyspnea with depression and functional status in patients with interstitial lung disease



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KEYWORDS

Interstitial lung disease;
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Abstract *Background:* Interstitial lung disease (ILD) is a chronic progressive disease resulting in substantial morbidity and mortality. The cardinal symptom of ILD is dyspnea; however, other pulmonary and extra-pulmonary symptoms are often present. Depression is a common comorbidity of many chronic diseases and directly impacts quality of life.

Aim of work: To determine the relationship of dyspnea with selected clinical and psychiatric variables including functional status and depression in patients with ILD.

Patients and methods: The work included thirty five clinically and radiologically known cases of ILD and ten healthy controls, they were subdivided into Group I: Twenty patients without pulmonary hypertension. Group II: Fifteen patients with pulmonary hypertension. Group III: Ten healthy controls. All cases subjected to medical history, clinical examination, plain X-ray chest, HRCT, 6-minute walk test, arterial blood gases, Flow/volume loop, echocardiography, Other investigations e.g., collagen profile and depression, anxiety, pain, sleep and dyspnea questionnaire.

Results: Among ILD groups: Dyspnea score showed a statistically significant positive correlation with psychiatric disorders (depression score, anxiety score, sleep disorders and pain score) while a statistically significant negative correlation with 6MWD, spirometric variables (FEV1 % and FVC %) and ABG variables (PaO₂ and SO₂ %). Dyspnea score, clinical variables (6MWD, RVSP,

Abbreviations: ILD, interstitial lung disease; HRCT, high resolution computed tomography; PHTN, pulmonary hypertension; 6MWD, 6 min walk distance; RVSP, right ventricular systolic pressure; FEV1, forced expiratory volume in 1st second; FVC, forced vital capacity; PaO₂, partial pressure of arterial oxygen; PaCO₂, partial pressure of arterial carbon dioxide; SO₂, oxy-hemoglobin saturation; IPF, idiopathic pulmonary fibrosis; NSIP, nonspecific interstitial pneumonia; LIP, lymphocytic interstitial pneumonia; DIP, desquamative interstitial pneumonia; RA, rheumatoid arthritis; HSP, hypersensitivity pneumonitis; GE, general electric; UCSD SOBQ, University of California San Diego Shortness of Breath Questionnaire; BDI, Beck Depression Inventory; BAI, Beck Anxiety Inventory; PSQI, The Pittsburgh Sleep Quality Index

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spirometric and ABG variables) and psychiatric disorders were statistically significantly more affected in ILD group with PHTN than in ILD group without PHTN. There was no statistically significant correlation between psychiatric disorders and both sex and smoking history among ILD groups.

Conclusion: Dyspnea is common in ILD and is strongly correlated with functional status and psychiatric disorders. Dyspnea score, functional status and psychiatric disorders are more affected in ILD with PHTN than in ILD without PHTN. Accordingly, routine screening for mental disorders is recommended for patients with ILD, and should be accompanied by accurate assessment of patient's symptoms, particularly in patients with high levels of functional impairment.

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Introduction

Interstitial lung disease (ILD) is a diverse group of conditions that is characterized by inflammation and fibrosis of the pulmonary parenchyma. In general, ILD are chronic and progressive diseases that result in substantial morbidity and mortality. The cardinal symptom of ILD is dyspnea; however, other pulmonary and extra-pulmonary symptoms are often present [1].

Dyspnea is common in patients with ILD. It is present at the time of diagnosis in 90% of patients with idiopathic pulmonary fibrosis (IPF), a common subtype of ILD [2,3].

Importantly, dyspnea severity has been shown to have a strong correlation with quality of life and mortality in patients with IPF [4]. Consequently, dyspnea is increasingly recognized as an important outcome for both prognostic and therapeutic purposes in ILD. Unfortunately, dyspnea is often refractory to currently available therapies [3].

While restriction and impaired gas exchange likely influence the presence and degree of dyspnea, other factors such as depression and functional status likely contribute to its severity [3].

Depression is a common comorbidity of many chronic diseases and directly impacts quality of life [5]. Comorbid depression has also been shown to predict future development of clinically relevant outcomes in several chronic diseases, including increased mortality [6].

The present study was designed to determine relationship of dyspnea with selected clinical and psychiatric variables including functional status and depression in patients with interstitial lung disease.

Subjects

The work included thirty five clinically and radiologically known cases of ILD and ten healthy controls. They were further sub-divided into three groups: *Group I:* Twenty patients without PHTN. *Group II:* Fifteen patients with PHTN. *Group III:* Ten healthy controls.

The participants were adult patients >20 years old with clinical history and radiological findings on HRCT compatible with the diagnosis of ILD.

Exacerbation of ILD, patients with superimposed chest infection (pneumonic infiltrate diagnosed by CT) and other system affection e.g., Cardiac and musculoskeletal system were excluded.

Methods

All were subjected to the following;

Full history taken and Clinical examination, stressing upon: age, sex, occupational, environmental, smoking and drug history (especially corticosteroids therapy as their psychiatric complications are not rare), Plain X-ray of the chest (P-A view), HRCT chest using general electric (GE) multislice four detector scanner, Arterial blood gas analysis using a blood gas analyzer (PHOX PLUS C), other investigations to confirm the diagnosis e.g., collagen profile.

Pulmonary function tests: Flow/volume loop using body plethysmography with highly transparent box; Sensor-medics V max series, 2130 Spirometer, V6200 Autobox, 6200DL. Spirometry measurements are evaluated by comparison of the results with appropriate reference value based on age, height, sex, and race. The Forced vital capacity (FVC), the forced expiratory volume in the first second (FEV1), the ratio of FEV1 to FVC measured. The presence of an FVC/FEV1 > 0.70 together with FVC < 80% predicated confirm the presence of restrictive lung disease [7].

Six-minute walk test: Conducted in 30 m long, flat corridor, and transit-free to avoid turn more often which slows patient's pace. Standardized instructions and encouragement were given, according to ATS guidelines [8]. The walk testing was discontinued if the patient had thoracic pain, intolerable dyspnea, cramps, dizziness, staggering, diaphoresis, pallor, or an SpO₂ < 90% [8].

Echocardiography was performed using (PHILIPS IE 33) apparatus. It has been used as screening test, stressing on examination of the right side of the heart, estimating the pulmonary artery systolic pressure (RVSP). Classification of severity of pulmonary hypertension according to RVSP: *Mild:* RVSP 35–44 mmHg, *Moderate:* RVSP 45–60 mmHg, *severe:* RVSP > 60 mmHg [9].

Depression, anxiety, pain, sleep and dyspnea questionnaire:

Degree of shortness of breath with exertion was measured using "University of California San Diego Shortness of Breath Questionnaire (UCSD SOBQ)": The SOBQ asks patients to indicate the severity of shortness of breath experienced on a six-point scale (0 not at all, to 5 = maximal or unable to do because of breathlessness) during 21 different activities of daily living associated with varying levels of exertion. Three additional questions about limitations due to shortness of breath, fear of harm from over exertion, and fear of shortness of breath are included for a total of 24 items. The SOBQ is scored

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