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Impact of Anxiety-Depressive Disorders in COPD Patients

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Abstract **Original Research Article**

***Introduction*:** Chronic obstructive pulmonary disease (COPD) is a respiratory disease associated with significant morbidity and mortality. Anxiety and depressive disorders are common in COPD patients, affecting up to 50% and 33% of cases, respectively. These psychiatric comorbidities worsen clinical outcomes, including dyspnea, treatment adherence, and quality of life. ***Methods*:** This prospective study was conducted between January 2021 and December 2023 and included 137 COPD patients from the pulmonology department of Hassan II Military Hospital in Laâyoune. Eligible participants were adults diagnosed with COPD based on post-bronchodilator spirometry (FEV1/FVC < 0.7). Psychiatric symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS), with scores ≥ 8 indicating the presence of anxiety or depression. Clinical and demographic data, GOLD phenotypes, exacerbation rates, and therapeutic adherence were analyzed using SPSS version 20. ***Results*:** Among the 137 patients (mean age 65 ± 9 years; 94% male), 38% exhibited anxiety or depressive symptoms. These disorders were more prevalent in GOLD phenotype E patients (54.4%, p = 0,03), with significant associations with severe dyspnea (mMRC score 3.1 ± 0.8, *p*= 0.01), CAT (28,4 ± 6,2, *p*=0,02) and frequent exacerbations (2.8 ± 1.1/year, $p < 0.001$). Patients with anxiety-depressive disorders reported lower therapeutic adherence (36.5% vs. 57.8%, $p = 0.04$) and a higher rate of treatment discontinuation (62% vs. 28%, $p = 0.02$). ***Conclusions*:** Anxiety and depressive disorders are highly prevalent among COPD patients and significantly impact clinical outcomes and treatment adherence. Integrating systematic psychiatric screening and targeted interventions into COPD management could improve patient outcomes and quality of life.

Keywords: Chronic obstructive pulmonary disease, Anxiety-depressive disorders, Quality of life, Therapeutic adherence, HADS.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a respiratory disease characterized by a progressive and irreversible limitation of airflow, representing a major cause of morbidity and mortality worldwide.

Patients with COPD frequently experience comorbidities, among which anxiety and depressive disorders hold a prominent place. The prevalence of anxiety in this population is estimated at 50%, while depression affects approximately 33% [1]. These psychiatric disorders significantly impact the clinical course of COPD. They exacerbate dyspnea, reduce exercise tolerance, increase fatigue and emotional instability, and compromise treatment adherence [1]. Furthermore, they are associated with a higher frequency of exacerbations and hospitalizations, as well as increased mortality [2]. Thus, a better understanding and management of psychiatric comorbidities associated with COPD can enhance the quality of life and clinical outcomes of affected patients.

Despite their detrimental impact, these disorders often remain underdiagnosed and undertreated in COPD patients. In this context, it is crucial to better understand the prevalence and impact of anxiety and depressive manifestations in COPD patients to improve their overall management.

This study aims to assess the prevalence of anxiety and depressive disorders in a population of patients with COPD, analyze their association with clinical disease characteristics—such as severity, frequency of exacerbations, and treatment response—and provide recommendations for integrating the evaluation and management of these disorders into the comprehensive care of these patients.

MATERIALS AND METHODS

Type of Study:

This was a prospective study conducted between January 2021 and December 2023, involving 137 patients with chronic obstructive pulmonary disease (COPD). Patients were recruited from those attending consultations or hospitalized in the pulmonology department of Hassan II Military Hospital in Laâyoune.

Population and Sample:

The study included adults aged 18 years or older with a confirmed diagnosis of COPD based on functional criteria, including post-bronchodilator spirometry showing a FEV1/FVC ratio < 0.7, indicative of irreversible obstructive ventilatory dysfunction. Exclusion criteria included the presence of pre-existing psychiatric disorders diagnosed before study inclusion, severe chronic diseases unrelated to COPD that could affect the patients' psychiatric status, and refusal to participate in the study.

Data Collection:

Data were collected using a structured questionnaire administered by a trained investigator. Psychiatric assessment was conducted using the Hospital Anxiety and Depression Scale (HADS), comprising 14 items evenly divided into two dimensions: anxiety and depression. A score of 8 or higher in either dimension indicated the presence of anxiety or depressive symptoms.

In addition to psychiatric data, several other variables were examined. Sociodemographic data included age, sex, education level, and socioeconomic status. Clinical characteristics included the GOLD phenotype (A, B, E), the degree of functional severity expressed as FEV1 percentage of the predicted value, the number of annual exacerbations, disease duration, and associated comorbidities. Treatment-related behaviors were also analyzed, including therapeutic adherence and response to maintenance therapy, evaluated through self-reported clinical improvement.

Data Analysis:

Data were analyzed using SPSS software version 20. Qualitative variables were expressed as frequencies and percentages, and associations between categories were assessed using the chi-squared test (chi² test). Quantitative variables were expressed as means ± standard deviation, and group comparisons were performed using Student's t-test for normally distributed data.

Ethical Considerations:

The study was conducted in compliance with the principles of the Declaration of Helsinki. All patients were informed about the study's objectives, and their written informed consent was obtained prior to inclusion.

RESULTS

General Characteristics of the Study Population

The study included 137 COPD patients with a mean age of 65 ± 9 years. The majority were male, 129 (94%), while only 8 (6%) were female. Regarding smoking status, 78 (56.9%) were current smokers, 49 (35.8%) former smokers, and 10 (7.3%) had never smoked. Clinically, 112 (81.8%) patients experienced dyspnea with an mMRC score ≥ 2, 74 (54%) had chronic bronchitis, and 88 (64.2%) reported chronic cough. On physical examination, a barrel chest was observed in 92 (67.2%) patients, while 18 (13.1%) showed digital clubbing. Radiologically, 85 (62%) patients exhibited signs of emphysema, and 73 (53.3%) had pulmonary hyperinflation. Spirometry showed that 12 (8.8%) patients were in GOLD stage 1, 41 (29.9%) in stage 2, 54 (39.4%) in stage 3, and 30 (21.9%) in stage 4. Finally, the GOLD phenotype distribution revealed that 11 (8%) patients were in phenotype A, 47 (34%) in phenotype B, and 79 (58%) in phenotype E. Table 1 summarizes the general characteristics of the studied population.

Prevalence of Anxiety-Depressive Disorders

Among the studied patients, 52 (38%) exhibited anxiety or depressive symptoms, as assessed by the HADS scale. Of these, 31 (59.6%) had scores suggestive of depression, 11 (21.2%) had scores indicative of anxiety, and 10 (19.2%) exhibited both anxiety and depressive symptoms. Most cases of anxiety-depressive disorders were mild (63%), while 34% were moderate and 3% severe (Table 2).

Clinical Symptoms of COPD and Anxiety-Depressive Disorders

Patients with anxiety-depressive disorders reported significantly more severe dyspnea compared to those without psychiatric disorders. The mean mMRC (Modified Medical Research Council) score, used to evaluate dyspnea severity, was 3.1 ± 0.8 in the anxiety-depressive group versus 2.3 ± 0.7 in the non-psychiatric group ($p = 0.01$). Among patients with an mMRC score ≥ 3, indicating severe dyspnea, 76.9% were in the anxiety-depressive group, compared to 23.1% in the non-psychiatric group (Table 3).

Quality of life assessment, performed using the COPD Assessment Test (CAT), also revealed a greater disease impact in the anxiety-depressive group. The mean CAT score in this group was 28.4 ± 6.2, compared to 20.6 ± 5.8 in the non-psychiatric group (p = 0.02). Moreover, 68% of patients with anxiety-depressive disorders had a CAT score ≥ 25, compared to 30% in the non-psychiatric group ($p = 0.01$) (Table 3).

Exacerbations and GOLD Phenotypes

Patients with anxiety-depressive syndrome reported a significantly higher annual exacerbation rate compared to those without psychiatric disorders. The mean number of exacerbations in the anxiety-depressive group was 2.8 ± 1.1 per year versus 1.6 ± 0.9 per year in

the non-psychiatric group ($p < 0.001$). Among frequent exacerbators (≥2 exacerbations/year), 36 patients (64.3%) were in the anxiety-depressive group, compared to 20 patients (35.7%) in the non-psychiatric group ($p < 0.001$) (Table 3).

Anxiety-depressive disorders were significantly more frequent among patients with phenotype E. Of the 79 patients with phenotype E, 43 (54.4%) exhibited anxiety-depressive syndrome, compared to only 9 patients (19.1%) in phenotype B and none among the 11 patients with phenotype A ($p = 0.03$) (Table 3).

Therapeutic Adherence

Therapeutic adherence was significantly reduced in patients with anxiety-depressive disorders. Among the 52 patients in the anxiety-depressive group, only 19 (36.5%) reported satisfactory adherence to maintenance therapy, compared to 48 patients (57.8%) in the non-psychiatric group ($p = 0.04$) (Table 3).

The mean number of missed doses per week was also higher in the anxiety-depressive group, averaging 3.2 ± 1.4 doses compared to 1.8 ± 1.1 in the non-psychiatric group (p = 0.03). Furthermore, 62% of anxiety-depressive patients reported temporary or permanent treatment discontinuation over the past 12 months, compared to 28% of patients without psychiatric disorders ($p = 0.02$) (Table 3).

Table 1: General Characteristics of the Study Population

Variables	Value (n = 137)
Sex *	
- Male	129 (94)
- Female	8 (6)
Age (years) §	65 ± 9
Smoking Status *	
- Active smokers	78 (56.9)
- Former smokers	49 (35.8)
- Non-smokers	10 (7.3)
Lifestyle *	
- Low physical activity	95 (69.3)
- Moderate physical activity	42 (31.7)
Functional Symptoms *	
- Dyspnea (mMRC ≥ 2)	112 (81.8)
- Chronic bronchitis	74 (54)
- Chronic cough	88 (64.2)
Clinical Examination *	
- Barrel chest	92 (67.2)
- Digital clubbing	18 (13.1)
Nutritional Status *	
- Underweight (BMI < 18.5 kg/m²)	31 (22.6)
- Normal BMI (18.5 - 24.9 kg/m²)	84 (61.3)
- Overweight (25 - 29.9 kg/m²)	22 (16.1)
Chest Radiology *	
- Presence of emphysema	85 (62.0)
- Pulmonary hyperinflation	73 (53.3)
Spirometry *	
- GOLD 1 (FEV1 ≥ 80%)	12 (8.8)
- GOLD 2 (50% ≤ FEV1 < 80%)	41 (29.9)
- GOLD 3 (30% ≤ FEV1 < 50%)	54 (39.4)
- GOLD 4 (FEV1 < 30%)	30 (21.9)
GOLD Phenotypes *	
- Phenotype A	11 (8)
- Phenotype B	47 (34)
- Phenotype E	79 (58)
Current Treatments *	
- LABA or LAMA	63 (46)
- LABA + LAMA	64 (46.7)
- LABA + LAMA + ICS	10 (7.3)
- Long-term oxygen therapy	21 (15.3)

* Expressed as number (percentage); § Expressed as Mean ± Standard Deviation

Table 2: Prevalence and Severity of Anxiety-Depressive Disorders

Psychiatric Disorders	Value as Frequency (%) (n = 52)
Depression alone	31 (59.6)
Anxiety alone	11 (21.2)
Anxiety + Depression	10 (19.2)
Mild disorders	33 (63)
Moderate disorders	18 (34)
Severe disorders	1 (3)

Table 3: Clinical Symptoms, Exacerbations, and Phenotypes by Presence of Anxiety-Depressive Disorders

Variables	With Disorders (n = 52)	Without Disorders (n = 85)	*p*-value
Clinical Symptoms			
- mMRC Score (mean ± SD)	3.1 ± 0.8	2.3 ± 0.7	0.01
- CAT Score (mean ± SD)	28.4 ± 6.2	20.6 ± 5.8	0.02
- CAT Score ≥ 25 (%)	68	30	0.01
Annual Exacerbations			
- Number of Exacerbations (mean ± SD)	2.8 ± 1.1	1.6 ± 0.9	< 0.001
- Frequent Exacerbators (%)	64.3	35.7	< 0.001
GOLD Phenotypes (%)			
- Phenotype A	0	100	
- Phenotype B	19.1	80.9	0,03
- Phenotype E	54.4	45.6	
Therapeutic Adherence			
- Satisfactory Treatment Response (%)	36.5	57.8	0.04
- Missed doses/week (mean ± SD)	3.2 ± 1.4	1.8 ± 1.1	0.03
- Treatment Interruption (%)	62	28	0.02

DISCUSSION

In this study, 38% of COPD patients exhibited anxiety or depressive symptoms according to the HADS criteria. This prevalence aligns with previous studies, which report anxiety rates ranging from 6.7% to 58% and depressive disorders from 5.5% to 51.5%, depending on the populations studied and methodologies used [3, 4]. The variations observed among studies can be attributed to cohort heterogeneity, particularly regarding disease severity, geographic context, and diagnostic tools. In our cohort, the use of the HADS, a validated tool adapted to the Arabic dialect, enabled standardized and reliable screening for anxiety and depressive disorders.

The observed anxiety-depressive disorders can be attributed to the psychological and emotional burden imposed by COPD. Fear of breathlessness, functional limitations, and social isolation contribute to a deterioration in the mental well-being of patients [5]. These findings highlight the importance of recognizing such disorders as a major component in the management of COPD patients.

Anxiety-depressive disorders were significantly more prevalent among patients with phenotype E. This phenotype is characterized by increased disease severity, frequent exacerbations, and a marked decline in quality of life. These observations are consistent with previous studies that show a higher prevalence of psychiatric disorders in patients with more severe COPD [6].

Severe dyspnea, measured by a mean mMRC score of 3.1 ± 0.8 in the anxiety-depressive group, is a major factor contributing to the development of these disorders. Persistent dyspnea exacerbates stress and anxiety, creating a vicious cycle in which psychiatric symptoms worsen the perception of breathlessness [7]. Additionally, frequent exacerbations, with an annual average of 2.8 ± 1.1 in anxiety-depressive patients, increase symptom burden and feelings of helplessness, further amplifying emotional disturbances. These findings underscore the need for integrated management, including targeted interventions to reduce dyspnea and provide psychiatric support, to break this vicious cycle.

Therapeutic adherence was markedly reduced in patients with anxiety-depressive disorders, with missed doses and temporary or permanent treatment interruptions reported over the past 12 months. These results corroborate studies showing that anxiety and depression are predictive factors for poor adherence to treatment in chronic diseases, including COPD [8]. These findings highlight the negative impact of psychiatric disorders on disease management, impairing patients' motivation and ability to follow regular treatment regimens.

These results underscore the necessity for an integrated approach in managing COPD patients, including systematic screening for anxiety and depressive disorders. The HADS scale could be routinely

used in consultations to identify at-risk patients early. Furthermore, therapeutic interventions should be tailored to the specific needs of this population, integrating multidimensional approaches such as respiratory rehabilitation combined with psychiatric or psychological support. Cognitive-behavioral therapy could also help patients better manage their anxiety and depression while improving therapeutic adherence. Finally, personalized pharmacological treatments, considering potential interactions with psychotropic medications, could contribute to more effective management of severe COPD associated with psychiatric comorbidities.

CONCLUSION

This study highlights the importance of addressing psychiatric dimensions in the comprehensive management of COPD. Anxiety and depressive disorders, often underdiagnosed, play a key role in exacerbating clinical symptoms and reducing treatment adherence. An integrated care approach could improve not only patients' mental health but also their quality of life and overall prognosis. These findings call for further research to evaluate the effectiveness of targeted interventions for these comorbidities and their impact on the long-term progression of the disease.

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