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CORRELATION OF DURATION OF INHALED STEROID USE ON PSYCHOLOGICAL SYMPTOMS IN COPD PATIENTS

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Abstract
Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder often treated with inhaled corticosteroids (ICS). While ICS are effective in managing COPD, prolonged use may have psychological side effects, including anxiety and depression.
Objective: This study explores the impact of the duration of inhaled steroid use on psychological symptoms, specifically anxiety and depression, in COPD patients.
Methods: A cross-sectional study was conducted with 160 COPD patients from outpatient respiratory clinics. Anxiety and depression were assessed using the Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-9 (PHQ-9) scales, respectively. The duration of ICS use was categorized into three groups: <5 years, 6-10 years, and 11-15 years. Spearman's rank correlation coefficient was used to analyze the relationship between ICS duration and psychological symptoms.
Results: The prevalence of anxiety increased with longer ICS use, though not statistically significant (Spearman's rho = 0.152, P = 0.056). Depression showed a significant positive correlation with ICS duration (Spearman's rho = 0.243, P < 0.01).
Conclusion: Prolonged use of inhaled corticosteroids in COPD patients is associated with increased prevalence of depression. Regular monitoring and timely intervention for psychological symptoms are recommended for COPD patients undergoing long-term ICS therapy
Key words: COPD, anxiety, depression. ICS

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder characterized by airflow limitation and persistent respiratory symptoms (1). The use of inhaled corticosteroids (ICS) is a mainstay in the management of COPD to reduce inflammation and prevent exacerbations (2). However, the long-term use of inhaled steroids has raised concerns about potential psychological side effects, including anxiety and depression (3). The psychological impact of chronic steroid use in COPD patients remains under-explored. This study aims to investigate the correlation between the duration of inhaled steroid use and the prevalence of anxiety and depression in COPD patients.

Psychological comorbidities such as anxiety and depression are prevalent among COPD patients and significantly impact their quality of life and disease outcomes (4, 5). The relationship between corticosteroid use and psychological symptoms has been extensively studied in other chronic conditions, such as asthma, where corticosteroids have been associated with mood changes and psychiatric disorders (6, 7). However, the specific impact of long-term ICS use on psychological health in COPD remains inadequately understood and warrants further investigation.

Aims and Objectives:

1. Estimate the co-relation between duration of ICS use and depression in COPD patient
2. Estimate the co-relation between duration of ICS use and anxiety in COPD patient

METHODS

Study Design and Population:

This cross-sectional study was conducted in the outpatient department of Bundelkhand Medical College, Sagar, Madhya Pradesh, India. The study was approved by the Institutional Ethics Committee, and informed consent was obtained from all participants.

The study was conducted involving 160 COPD patients from respiratory opd. Inclusion criteria were a confirmed diagnosis of COPD according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines and current use of inhaled corticosteroids (8).

Patients with co-morbid conditions that could interfere with the study, such as uncontrolled hypertension, ischemic cardiac disease, active tuberculosis, acute cor-pulmonale, severe pulmonary hypertension, significant hepatic dysfunction, metastatic cancer, renal failure, severe cognitive deficit, and psychiatric disease that interfere with memory and compliance, were excluded from the study. HIV positive patients and pregnant patients were also excluded from the study.

Assessment Tools:

Anxiety: Assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale, with scores ≥5 indicating clinically significant anxiety (9).

Depression: Assessed using the Patient Health Questionnaire-9 (PHQ-9) scale, with scores ≥5 indicating clinically significant depression (10).

Duration of Inhaled Steroid Use: Categorized into three groups: <5 years, 6-10 years, and 11-15 years.

Data Analysis:

Descriptive statistics were used to summarize patient demographics and clinical characteristics. The Spearman's rank correlation coefficient was employed to analyze the relationship between the duration of inhaled steroid use and psychological symptoms. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Patient Characteristics:

The study sample comprised 160 COPD patients, with a mean age of 60.71 years (SD = 9.4), of which 124 (77.5%) were male.

Anxiety & Depression Prevalence

Mild anxiety (21%) was more prevalent than moderate (13%) and moderately severe (2%). Similarly mild depression (26%) was more prevalent than moderate (17%) and moderately severe (2%) None of the patient was found to have severe anxiety or depression in our study.

The distribution of patients based on the duration of inhaled steroid use was: <5 years (137 patients), 6-10 years (21 patients), and 11-15 years (2 patients).

Table 1. Correlation of anxiety & depression with Duration of Inhaled Steroid use

Duration of Inhaled Steroid	Anxiety Yes	Anxiety No	Total	DepressionYes	DepressionNo	Total
<5	46(33.58%)	91(66.42%)	137(100%)	57(40.71%)	83(59.29%)	140(100%)
6-10	10(47.62%)	11(52.38%)	21(100%)	12(66.67%)	6(33.33%)	18(100%)
11-15	2(100%)	0(0%)	2(100%)	2(100%)	0(0%)	2(100%)
Total	58	102	160	71	89	160

Prevalence of Anxiety and Depression:

Anxiety: Prevalence increased with longer duration of inhaled steroid use, though not statistically significant (Spearman's rho = 0.152, P = 0.056).

< 5 years: 33.58% (46/137) had anxiety.
6-10 years: 47.62% (10/21) had anxiety.
11-15 years: 100% (2/2) had anxiety.

Depression: Showed a statistically significant positive correlation with the duration of inhaled steroid use (Spearman's rho = 0.243, P < 0.01).
< 5 years: 40.71% (57/140) had depression.
6-10 years: 66.67% (12/18) had depression.
11-15 years: 100% (2/2) had depression.

DISCUSSION

The findings of this study underscore the complex interplay between prolonged inhaled steroid use and psychological symptoms in COPD patients. The observed increase in depression prevalence with longer ICS duration suggests a potential dose-response relationship between corticosteroid exposure and mental health outcomes (11, 12). This aligns with previous research indicating that corticosteroids can disrupt the hypothalamic-pituitary-adrenal (HPA) axis and influence neurotransmitter systems implicated in mood regulation (13).

Interestingly, while anxiety prevalence also showed an upward trend with increasing ICS duration, the correlation was not statistically significant in this study cohort. This finding may reflect the heterogeneous nature of anxiety symptoms in COPD, influenced by factors beyond corticosteroid therapy alone, such as disease severity, comorbidities, and psychosocial stressors (14, 15).

The implications of these findings extend beyond clinical management to patient-centered care approaches. Healthcare providers should consider regular screening for psychological symptoms in COPD patients undergoing long-term ICS therapy, coupled with timely interventions to mitigate potential adverse effects on mental well-being. Integrated care models that incorporate mental health assessments alongside pulmonary evaluations could enhance overall patient outcomes and quality of life (16, 17).

Future research directions should include longitudinal studies to establish causality and elucidate the mechanisms underlying corticosteroid-induced psychiatric symptoms in COPD. Additionally, exploring personalized medicine approaches that account for individual susceptibility factors and treatment responses may pave the way for tailored interventions aimed at optimizing both respiratory and psychological health in this vulnerable patient population (18, 19).

Limitations

This study has several limitations. The cross-sectional design does not allow for establishing causality between Psychaitric symptoms and ICS. Longitudinal studies are needed to explore the causal relationships and the impact of interventions over time. Additionally, the study was conducted in a single tertiary care center, which may limit the generalizability of the findings to other settings or populations. Future research should include diverse populations and settings to validate these findings.

Conclusion

In conclusion, while inhaled corticosteroids remain indispensable in COPD management, their prolonged use necessitates vigilant monitoring of psychological symptoms. By recognizing and addressing the impact of corticosteroid therapy on mental health, healthcare providers can strive towards holistic care that addresses the multifaceted needs of COPD patients.

Conflict of interest: There is no conflict of interest

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