Prevalence of Depression and Anxiety in Outpatients with Chronic Airway Lung Disease

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Background/Aims: Patients with chronic airway lung diseases often experience depression and anxiety, but little information is available regarding Koreans with these conditions. We thus assessed depression and anxiety in Korean patients with chronic airway lung diseases.

Methods: The degree of depression and anxiety in 84 outpatients with chronic obstructive pulmonary disease (COPD), 37 with asthma, 33 with bronchiectasis, and 73 healthy controls were evaluated by the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI).

Results: The patients with COPD and bronchiectasis had higher BDI scores and were more likely than controls to experience depression ([COPD, 17; range, 0 to 42; prevalence, 55%], [bronchiectasis, 16; range, 3 to 51; prevalence, 55%], [controls, 13; range, 0 to 31; prevalence, 30%], \( p < 0.05 \)). The state-anxiety scores of the patients were higher than those of the controls, but only the bronchiectasis group demonstrated a higher frequency of state-anxiety compared with the controls (39 vs. 16%, patients vs. controls, \( p = 0.015 \)). Among all patients, 22% presented with concomitant depression and state-anxiety, and 25% demonstrated depression and trait-anxiety. Depression was positively correlated with both state-anxiety (\( r = 0.644 \)) and trait-anxiety (\( r = 0.597, p < 0.0001 \)). Irrespective of individual diagnosis, post-bronchodilator FEV\(_1\) (odds ratio [OR], 0.972; \( p = 0.027 \)) and smoking history (OR, 3.894; \( p = 0.018 \)) were independent risk factors for depression in patients with chronic airway lung diseases.

Conclusions: Chronic airway lung diseases are associated with depression and/or anxiety, particularly in those with a higher airflow limitation and/or history of smoking. (Korean J Intern Med 2010;25:51-57)

Keywords: Depression; Anxiety; Pulmonary disease, chronic obstructive; Asthma; Bronchiectasis

INTRODUCTION

Chronic respiratory conditions are being recognized with increasing frequency in both Korea and worldwide [1-3] and are associated with an increased risk for mood and anxiety disorders [4-7]. Activities of daily living may be severely impaired in patients with chronic airway lung diseases owing to chronic psychological stress and somatic pain, frequent admission to the hospital, and dependence on medical and nursing personnel. Depression and anxiety cause deterioration in social functioning and quality of life and are correlated with levels of subjective dyspnea and disease progression [8-11]. Thus, detecting depression or anxiety in patients with chronic airway lung diseases is of great importance. Although the close correlation between anxiety and depression is well known, few studies have examined their simultaneous occurrence in patients with chronic respiratory conditions. Moreover, studies assessing and comparing anxiety and depression levels among patients with different chronic airway lung diseases such
as chronic obstructive pulmonary disease (COPD), bronchial asthma, and bronchiectasis have been scarce in Korea.

The present cross-sectional study compared the levels and frequency of anxiety and depression among outpatients presenting at our pulmonary department with COPD, bronchial asthma, or bronchiectasis. In addition, we evaluated the clinical variables associated with depression in patients with chronic airway lung diseases.

**METHODS**

**Subjects**

We recruited 73 healthy control participants with no underlying lung disease or respiratory symptoms and 154 outpatients, 45 years of age and older, with chronic airway lung diseases who presented at the pulmonary department of our hospital. Of the 154 patients, 84 were diagnosed with COPD, 37 had bronchial asthma, and 33 had bronchiectasis. All patients received prior clinical evaluations and pulmonary function tests. This report presents the results of a cross-sectional assessment of depression and anxiety in these outpatients.

**Data analysis**

Cross-sectional data obtained from measures of pulmonary function, laboratory values, smoking behavior, nutrition, age, sex, and symptoms of depression and anxiety were analyzed for all subjects. The forced vital capacity (FVC) and forced expiratory volume one second (FEV1) before and 15 min after inhalation of 400 µg of salbutamol were determined in terms of pulmonary function units (SensorMedics, Yorba Linda, CA, USA). Based on the definition provided by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) [12], COPD was defined by a chronic airflow limitation not fully reversible by bronchodilation. Obstruction was defined as a post-bronchodilator FEV1/FVC ratio < 0.70, and severity was classified into four categories according to the post-bronchodilator FEV1 value calculated as a percentage of the predicted value for normal subjects: mild obstruction, FEV1 > 80% of the predicted value; moderate, 50 to 79% of the predicted value; severe, 30 to 49% of the predicted value; and very severe, < 30% of the predicted value. Patients with a FEV1 reversibility of > 12% were excluded. Asthma was defined as an increase in FEV1 of ≥ 12% and ≥ 200 mL compared to pre-bronchodilator values [13] at the time of diagnosis. All patients received routine treatment with inhaled corticosteroids and/or long-acting bronchodilators. The patients with bronchiectasis were treated in our outpatient clinic for symptoms attributable to the bronchiectasis and were diagnosed by high-resolution computed tomography of the chest [14]. We excluded patients who had experienced acute exacerbations in their underlying chronic airway lung diseases within the past month.

Anxiety symptoms were evaluated with the State-Trait Anxiety Inventory (STAI) developed by Spielberger et al. [15] in 1970, which has been translated and standardized for use in the Korean population [16]. The STAI consists of two self-evaluation scales designed to assess state-anxiety and trait-anxiety separately. The state-anxiety anxiety scale evaluates a transitory state-anxiety in which unpleasant feelings, tension, and intensity vary according to the situation. The trait-anxiety scale assesses a longer-term personality characteristic. Each scale contains 20 items, each of which is rated from 1 to 4. Clinically significant levels of state-anxiety or trait-anxiety were defined as scores ≥ 50 on the state-anxiety or trait-anxiety subscale [5,17]. Depression was assessed with the Beck Depression Inventory (BDI) [18,19], which has been standardized for and used in the Korean population [20]. The BDI, a self-administered measurement of depression, has been translated into many languages and validated for use in several countries, including Korea. The questionnaire rates 21 items addressing emotional, cognitive, motivational, physiological, and other symptoms on a scale from 0 to 3; higher scores reflect more severe symptoms of depression. In accordance with Jo et al. [21], a threshold of 16 on the BDI was used to separate patients with mild or no depression (BDI < 16) from those with moderate to severe depression (BDI ≥ 16). All subjects completed the Korean versions of the STAI and BDI.

All participants were informed about the study, and all provided informed consent for their participation. Although we did not obtain approval from the institutional review board, this research was conducted according to the highest ethical standards and conformed to the 1995 Declaration of Helsinki (as revised in Edinburgh, 2000, and updated in Tokyo, 2004). This study used data collected from questionnaires, and the subjects understood that their refusal to participate would not affect the quality of their clinical care in any way. After BDI and STAI scores were determined, the patients were informed of the results.