Original Research Article

Evaluation of Anxiety and Depression among Patients with Obstructive Airway Disease

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Abstract

Background: Psychiatric symptoms which constitute a major and growing public health problem of anxiety, depression, and cognitive dysfunction often occur in patients suffering from somatic conditions like asthma and chronic obstructive pulmonary disease (COPD). In Bangladesh, we have very little research-oriented information regarding these issues. *Aim of the study*: The aim of this study was to determine the association of anxiety and depression with asthma and COPD. *Methods:* This cross-sectional observational study was conducted at the Department of Respiratory Medicine in the National Institute of Diseases of the Chest and Hospital from March 2018 to February 2019. A total of 160 cases of Asthma and COPD were enrolled in this study as study. Statistical analyses of the results were obtained by using Windows-based computer software devised with Statistical Packages for Social Sciences (SPSS-23.0). *Results:* In this study in total 98 (61.3%) patients had COPD and 62 (38.7%) had asthma. Among 98 COPD patients 10 (10.2%) had mild, 29 (29.6%) had moderate, 40 (40.8%) had severe and 19 (19.4%) had very severe COPD. Among 62 asthmatic patients 22 (35.5%) had mild, 16 (25.8%) had moderate, 11 (17.7%) had severe and 13 (21.0%) had very severe asthma. Among total participants, the mean Beck depression inventory score was found 95.6±12.6, the mean anxiety rating scale score was found 61.0±11.7 and the mean HADS score was found 12.1±1.5. In COPD patients, the mean Beck depression inventory score was found at 99.9±10.7, the mean anxiety rating scale score was found 57.1±10.7 and the mean HADS score was found 11.8±1.3. On the other hand, in asthmatic patients, the mean Beck depression inventory score was found 88.8±12.4, the mean anxiety rating scale score was found 67.4±10.3 and the mean HADS score was found 12.6±1.7. *Conclusion:* We can conclude that the Beck depression inventory score, anxiety rating scale score, and HADS score were statistically significant when compared to the level of severity of COPD and asthma. Excluding other risk factors for anxiety and depression, still, COPD & asthma patients remain at risk of both anxiety and depression.
Key words: Anxiety, Depression COPD, asthma HADS Score, anxiety rating scale.

I. INTRODUCTION

Psychiatric symptoms which constitute a major and growing public health problem of anxiety, depression, and cognitive dysfunction often occur in patients suffering from somatic conditions like asthma and chronic obstructive pulmonary disease (COPD). In Bangladesh, we have very little research-oriented information regarding these issues. Chronic obstructive pulmonary diseases (COPD) and asthma are two common presentations of pulmonary obstructive diseases. The prevalence of asthma has been increased in recent decades as a major cause of disability and death [1]. Chronic obstructive pulmonary disease (COPD) is the fourth cause of death in some parts of the world [2]. Fifteen percent of population aged 55 to 64 suffer from at least a moderate obstructive pulmonary disease and this increases to 25% after 75 years of age [3]. According to WHO 2015 global data, 3.6 % of global people suffer from anxiety whereas depression occurs in 4.4 %. In Bangladesh according to WHO 2017, 4.4 % people suffer from anxiety whereas depression 4.1 % people. Almost 75% of people with mental disorders remain untreated. It makes sense that asthma and COPD significantly affect mental health

because they impact on activities, sleep and social life of patients. On the other hand, psychological factors may be a risk factor for exacerbation of these pulmonary disorders. These coexisting psychiatric disorders should be diagnosed and treated as soon as possible, to improve patients' outcome, but unfortunately, they often remain undiagnosed without psychiatric assessment. For the purpose standard psychiatric questionnaires like "Beck Depression Inventory", "Anxiety rating scale" and "Hospital Anxiety and Depression Scale" could be used. Beck Depression Inventory (BDI) is an easy-to-use self-report questionnaire which was developed to measure the 21 behavioral manifestations and severity of depression, and screens patients who may require intervention and monitor changes in treatment studies. BDI has a high internal consistency (Cronbach α=0.87) and acceptable test-retest reliability (r=0.74) in Persian version [4]. People with scores between 0-13, 14-19, 20-28 and 29-63 are suggested to have minimal, mild, moderate and severe depression, respectively [5]. BDI has been validated in Bengali. Anxiety Rating Scale (ARS) provides an overall measure of global anxiety severity, including psychic and somatic symptoms and monitors treatment outcomes. It includes 36 items. The scores range from 0 to 144. People with scores equal or more than 67 has been suggested to indicate clinically significant anxiety [6]. ARS has been validated in Bengali. "Hospital Anxiety and Depression Scale (HADS)" is a multidimensional test which consists of 14 questions that assesses both depression & anxiety together. The scores range from 0 to 21. This scale is also validated in Bengali. More than 1000 studies demonstrated the validity, reliability and power of these scales [7, 8]. But standard psychiatric interview is necessary to prove the diagnosis. Validity and reliability of these questionnaires in Iranian population have been demonstrated [9, 10]. This study would be conducted to evaluate the psychological status especially depression and anxiety in asthmatic and COPD patients and clarify if there is a relationship between psychological status and type and severity of pulmonary diseases.

II. OBJECTIVES

General Objective
- To determine whether there is any association of anxiety & depression with disease severity in patients of asthma & COPD.

Specific Objective
- To find out the association of asthma with anxiety and depression.
- To find out the association of COPD with anxiety and depression.

III. METHODOLOGY & MATERIALS

This is a cross-sectional observational study. The study was carried out in the Department of Respiratory Medicine in collaboration with the Respiratory Laboratory of the National Institute of Diseases of the Chest and Hospital (NIDCH), Mohakhali, Dhaka during the period from March 2018 to February 2019. In total 160 stable cases of asthma and COPD attended both outdoor and indoor of NIDCH, Mohakhali, Dhaka during the study period were selected as the study people. According to the inclusion criteria of this study, only COPD and asthma patients defined as per GOLD and GINA guidelines were included as the study people. On the other hand, according to the exclusion criteria of this study, known cases of other major psychological illnesses, unconscious patients, acute exacerbation of COPD, severe acute asthma, cases of respiratory failure, and other patients with long-standing co-morbidities were excluded. In this study, age, sex, occupation, smoking, education, nutritional status, socioeconomic status, and employment status were considered as the demographic variables. On the other hand, the outcome variables of obstructive airways disease were beck depression inventory score, anxiety rating scale score, and HADS score. The basic principle of research ethics according to 52 th WMA declaration of Helsinki' 2000 and CIOMS guidelines was maintained during the research processes. An ethical clearance certificate was taken from the concerned authorities of the institute. In case, information about patients was obtained after getting consent. Consent from the patient was obtained after discussing with the patient about the study procedure. Data were recorded by a standard proforma. In the first phase, written informed consent was obtained from the patients with obstructive airway diseases fulfilling the inclusion and exclusion criteria. Spearman's rank correlation coefficient was used for beck depression inventory score, anxiety rating scale score with COPD severity, and asthma severity. A P-value of less than 0.05 was considered as significant. All data were analyzed by using SPSS-23 (statistical package for social sciences). Data were presented in frequency, percentage and mean, and standard deviation as applicable. ANOVA test was used for continuous variables as shown cross-tabulation.

IV. RESULT

A total number of 160 patients were selected and the mean age of the total participants was 53.0±14.0 years. In this study, the male-female ratio of the study people was 2.6:1. The majority (91.2%) of patients were married. Almost three fourth (73.7%) of patients were from rural areas. Almost one-third (31.9%) of patients completed primary education level. The majority (27.5%) of patients were service holders. The average monthly income was 1871.9 ± 4888.8 taka. Almost two-thirds (66.3%) of patients were smokers. In total 98 (61.3%) patients had COPD and 62 (38.7%) had asthma. In this study in total 98 (61.3%) patients had COPD and 62 (38.7%) had asthma. Among 98 COPD patients 10 (10.2%) had mild, 29 (29.6%) had moderate, 40 (40.8%) had severe and 19 (19.4%) had very severe COPD. Among 62 asthmatic patients 22

(35.5%) had mild, 16 (25.8%) had moderate, 11 (17.7%) had severe and 13 (21.0%) had very severe asthma. Among total participants, the mean Beck depression inventory score was found 95.6±12.6, the mean anxiety rating scale score was found 61.0±11.7 and the mean HADS score was found 12.1±1.5. In COPD patients, the mean Beck depression inventory score was found 99.9±10.7, the mean anxiety rating scale score was found 57.1±10.7 and the mean HADS score was found 11.8±1.3. On the other hand, in asthmatic patients, the mean Beck depression inventory score was found 88.8±12.4, the mean anxiety rating scale score was found 67.4±10.3 and the mean HADS score was found 12.6±1.7. In this study, a positive significant correlation (r=0.425; p=0.001) in Spearman's rank correlation coefficient test between beck depression inventory score and COPD severity was found. On the other hand, another positive significant correlation (r=0.394; p=0.002) in Spearman's rank correlation coefficient test between beck depression inventory score and asthma severity was found.

Table-I: Socio-demographic status of participants (N=160)

Variables	n (%)
Age	
Mean age in years	53.0 ± 14.0
Sex	
Male	85 (53.1)
Female	75 (46.9)
Marital status	
Married	146 (91.2)
Unmarried	14 (8.8)
Location	
Urban	42 (26.3)
Rural	118 (73.7)
Education	
Primary education	51 (31.9)
Service holder	44 (27.5)
Others	65 (40.6)
Monthly family income in taka	
Mean monthly income	4888.8±1871.9
Smoking habits	
Smoker	106 (66.3)
Non smoker	54 (33.7)

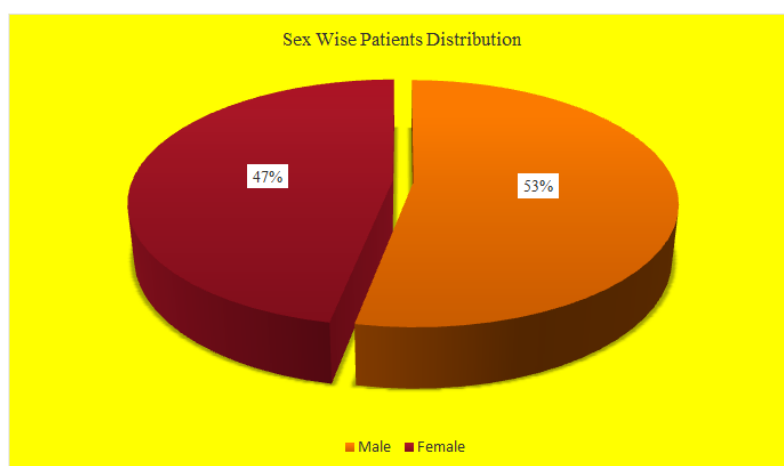**Fig-I: Sex Wise Patients Distribution**

Table-II: Disease types and severity among the participants (N=160)

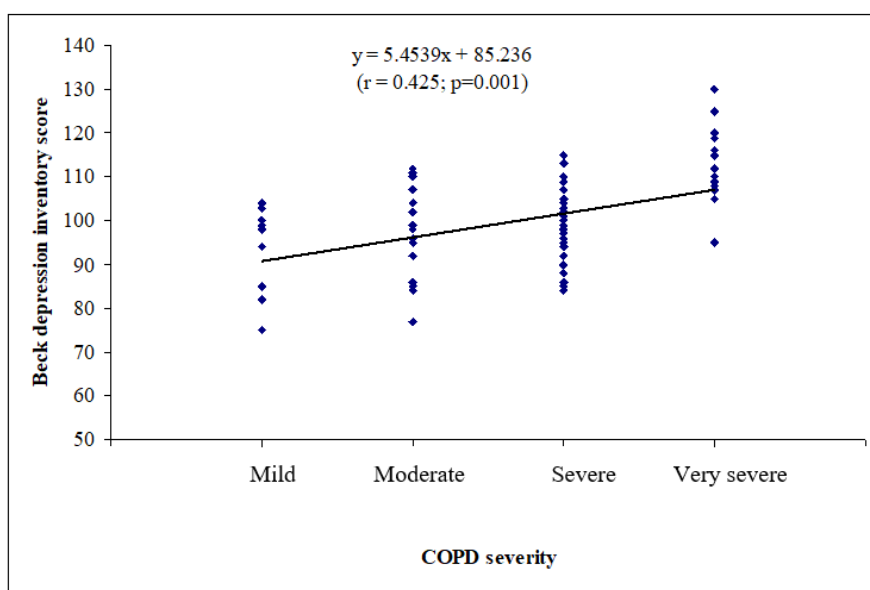| Variables	n	%
Disease distribution (n=160)		
COPD	98	61.25
Asthma	62	38.75
Severity status of COPD patients (n=98)		
Mild	10	10.20
Moderate	29	29.59
Severe	40	40.82
Very severe	19	19.39
Severity status of asthma patients (n=62)		
Mild	22	35.48
Moderate	16	25.81
Severe	11	17.74
Very severe	13	20.97
Mean scores COPD patients		
Mean depression inventory	95.6 ± 12.6	
Mean anxiety rating	61.0 ± 11.7	
Mean HADS score	12.1 ± 1.5	
Mean scores of asthma patients		
Mean depression inventory	99.9 ± 10.7	
Mean anxiety rating	57.1 ± 10.7	
Mean HADS score	11.8 ± 1.3	
Mean scores of all patients		
Mean depression inventory	88.8 ± 12.4	
Mean anxiety rating	67.4 ± 10.3	
Mean HADS score	12.6 ± 1.7	

Fig-II: Positive significant correlation (r=0.425; p=0.001) in Spearman's rank correlation co-efficient test between beck depression inventory score and COPD severity (n=98)
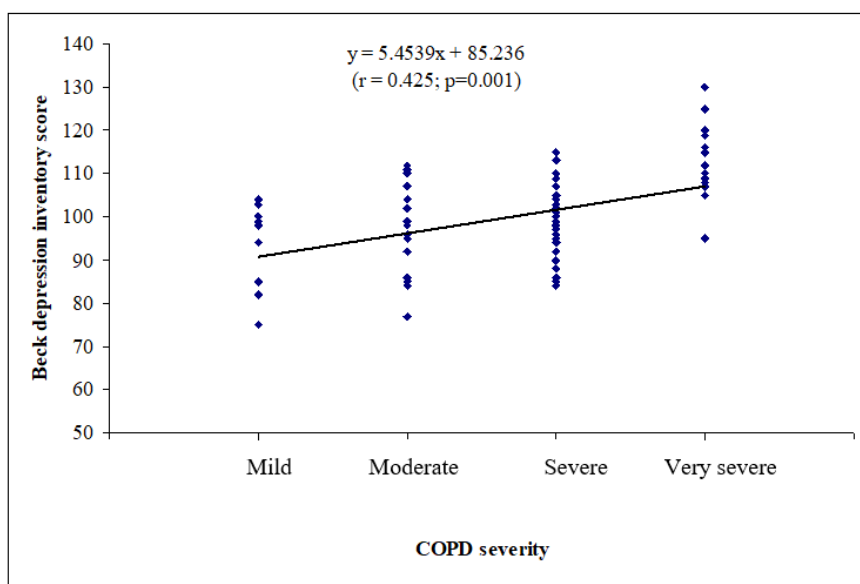
Fig-III: Positive significant correlation (r=0.394;
p=0.002) in Spearman's rank correlation co-efficient
test between beck depression inventory score and asthma
severity. (n=98)

V. DISCUSSION

Patients suffering from chronic somatic diseases are often observed psychiatric co-morbidities. Particularly high prevalence rates of cognitive dysfunction, depression and anxiety disorders have been reported for patients with asthma and COPD [11]. Like other major chronic diseases, both asthma and COPD has a significant impact on psychological well-being of people. Patients with COPD even in a mild stage have a higher prevalence of depression and anxiety than the general population [12]. In this present study it was observed that 98 (61.3%) patients had COPD and 62 (38.7%) had asthma. Similar study done by Asnaashari et al. [13] where they found the prevalence of general psychopathology in COPD patients was 42.3%. Mahajan [14] have found that 32.4% of COPD patients had psychiatric co morbidities compared to only 20.6% of asthma patients and both were statistically significant (p <0.001). In this study it was observed that 98 patients had COPD among them 10 (10.2%) had mild, 29 (29.6%) had moderate, 40 (40.8%) had severe and 19 (19.4%) had very severe COPD. Asnaashari et al. [13] documented in their study, mild COPD was found in 34.6%, moderate was found in 38.5% and severe 26.9%. In my study it was observed that, 62 patients had asthma among them 22 (35.5%) had mild, 16 (25.8%) had moderate, 11 (17.7%) had severe and 13 (21.0%) had very severe asthma. Asnaashari et al. [13] showed in their study, mild asthma was 70.6%, moderate 17.6% and severe 11.8%. In this current study it was observed that, almost two third (65.0%) patients were found to have minimal (30-100) beck depression inventory score. The mean Beck depression inventory score was found 95.6 ± 12.6 with range from 70 to 130. Dursun et al. [15] observed

their study mean Beck depression inventory score was found 20.57±12.67. In this study it was observed that, majority (89.4%) patients were found abnormal (11-21) HADS score. The mean HADS score was found 12.1±1.5 with range from 9 to 18. Cooper [16] found the proportion of patients with a HADS anxiety score of 10 or more was 31.6%. In this present study it was observed that, in COPD patients, the mean Beck depression inventory score was found 99.9±10.7 with range from 75 to 130. The mean anxiety rating scale score was found 57.1±10.7 with range from 35 to 80. The mean HADS score was found 11.8±1.3 with range from 9 to 15. Asnaashari et al. [13] documented their study beck depression mean score in COPD was 17.88±9.87. Hamilton anxiety score in COPD was 17.76±9.67. In this current study it was observed that, in asthma patients, the mean Beck depression inventory score was found 88.8±12.4 with range from 70 to 116. The mean anxiety rating scale score was found 67.4±10.3 with range from 47 to 91. The mean HADS score was found 12.6±1.7 with range from 9 to 18. Asnaashari et al. [13] showed their study the Beck depression mean score in asthmatic was 18.23±10.38. Bratek et al. [17] observed their study mean Beck depression inventory score was found 8±7 in asthma patients. The STAI (trait anxiety inventory) mean score of the asthma group was 35±11. Although there are some controversies about the prevalence of depression and anxiety in asthma, it is estimated that depression and anxiety are 6 times more prevalent in asthmatics in comparison with general population. While, Asnaashari et al. [13] study showed that there is not a significant difference between asthmatic and COPD patients in terms of general psychopathology, depression or anxiety. In this present study it was observed that mean Beck depression inventory score was found 83.0±9.0 in

mild asthma, 88.9±11.6 in moderate, 86.8±9.5 in severe and 100.2±13.9 in very severe asthma. The mean anxiety rating scale score was found 60.0 ± 8.0 in mild asthma, 65.4±6.7 in moderate, 70.5±5.5 in severe and 79.7±8.6 in very severe asthma. The mean HADS score was found 11.8±1.3 in mild asthma, 12.8±1.3 in moderate, 12.7±1.7 in severe and 14.0±1.9 in very severe asthma. Beck depression inventory score, anxiety rating scale score and HADS score were statistically significant (p<0.05) when compared level of severity asthma. When the asthma severity groups were examined separately in relation with anxiety rating scale, significant correlations existed in those individuals with mild, moderate and very severe asthma (r=0.675, p=0.001). Also, significant correlations existed in those individuals with very severe asthma (r=0.394, p=0.002) regarding Beck depression inventory. When the COPD severity groups were examined separately in relation with Beck depression inventory, significant correlations existed in those individuals all groups of COPD (r=0.425, p=0.001). Also, significant correlations existed in those individuals with very severe group of COPD (r=0.372, p=0.001) regarding anxiety rating scale. Previous studies examining the association between asthma severity and depression have yielded mixed results with some finding a positive association while others have not [18]. There are some controversies about the prevalence of depression and anxiety in asthma. Wang et al. [19] showed that 70% of asthmatic patients have some degrees of anxiety and/or depression. Other studies estimated that depression and anxiety are 6 times more prevalent in asthmatics in comparison with general population [20].

VI. CONCLUSION AND RECOMMENDATIONS

We can conclude that beck's depression inventory score, anxiety rating scale score, and HADS score were statistically significant when compared to the level of severity of COPD and asthma. The incidence of anxiety and depression is much higher in both COPD & asthma. Symptoms of depression are more in COPD and symptoms of anxiety are more in asthma. But symptoms of anxiety and depression together are significantly higher in both COPD & asthma patients. Excluding other risk factors for anxiety and depression, still, COPD & asthma patients remain at risk of both anxiety and depression. For getting more reliable information we would like to recommend conducting more studies in several places with large sample sizes.

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