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Original Research Article

Depression and anxiety in asthma patients attending a tertiary care centre in north Kerala: a cross-sectional study

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ABSTRACT

Background: Asthma is a common chronic non-communicable disease that causes substantial burden to people, often causing a reduced quality of life, not only due to its physical effects, but also its psychological and social effects. Objectives were to assess the prevalence of depression and anxiety in patients with stable asthma in a tertiary care centre. to assess the relationship between bronchial asthma symptom control and degree of depression and anxiety. To assess the quality of life in asthma patients.
Methods: It was a cross-sectional study conducted in govt. medical college, Kannur for 1 year duration. The 150 patients with stable asthma, attending the outpatient clinic of department of chest diseases, satisfying inclusion criteria were included in the study. The socio demographic details and the relevant clinical details were collected using the socio demographic proforma. Spirometry was done for all patients. Quality of life of these patients was assessed with standardized asthma quality of life questionnaire-Malayalam version. For psychological status, (HADS) 23 scale was used.
Results: We found 33 patients (22%) to have depression and 33 (22%) patients to have anxiety among stable asthma patients. AQLQ scores were assessed and obtained a median of 4.92, interquartile range of 5.0. The median AQLQ scores among patients with no anxiety and depression was 5.56. The median AQLQ score among patients with depression and anxiety was 3.400. There was significant correlation between the control of asthma with AQLQ score.
Conclusions: Depression and anxiety is substantially related to quality of life, and hospitalization in asthma patients.

Keywords: Depression, Anxiety, Asthma, Quality of life, Prevalence

INTRODUCTION

Asthma is defined as a chronic inflammatory disorder of the airways which manifests itself as recurrent episodes of wheezing, breathlessness, chest tightness and cough. It is characterized by bronchial hyper-responsiveness and variable airflow obstruction, that is often reversible either spontaneously or with treatment.[1] Asthma imposes a tremendous burden on the healthcare system and society of India due to loss of productivity, especially due to the fact that young individuals in the most efficient phase of their life, are affected.[2] It is well documented that psychological and respiratory symptoms can be interrelated. Healthy subjects are more likely to report respiratory symptoms (cough, phlegm, wheeze and dyspnoea) than if they have an abnormal psychological status (anxiety, depression, anger or cognitive disturbances).[3]

Asthma can reduce HRQoL as a result of profound physical and psychosocial complications. Besides physical symptoms, asthma patients may exhibit fatigue,

psychomotor sluggishness, irritability, and mood and cognitive disturbances. This combination of physical, emotional, and functional problems may diminish HRQoL.[4]

HRQoL measures are increasingly being integrated into clinical research in asthma. The goals of asthma therapy are to improve the patients' quality of life by preventing chronic and troublesome symptoms, maintaining "normal" lung function, maintaining normal activity levels, preventing recurrent exacerbations and providing optimal pharmacotherapy with minimal adverse effects.[5] The issue of the quality of life of patients with bronchial asthma is very often overlooked in the clinical practice.

With the evidence from various studies, asthma symptoms have been found to have definite correlation with the occurrence of depression and anxiety in patients, it is important to diagnose psychiatric symptoms in these patients, thereby enabling better management of asthma, and improving their quality of life.[6,7] There are however insufficient studies depicting the prevalence of depression and anxiety in stable asthma patients, its association with severity of symptoms and its impact on the quality of life in such patients residing in north Kerala. Main aims and objectives of our study were to assess the prevalence of depression and anxiety in patients with stable asthma in a tertiary care centre, to assess the relationship between asthma control symptoms and degree of depression and anxiety& to assess the quality of life in stable asthma patients.

METHODS

It was a cross-sectional study.

Study population

All patients with stable asthma attending the department of respiratory medicine diagnosed with asthma in accordance with the GINA guidelines.

Inclusion criteria

Patients diagnosed to have stable asthma, patients of either gender, above 18 and below 65 years of age. Those patients willing to give informed consent for psychiatric evaluation and patients with stable asthma were included in the study.

Exclusion criteria

Patients with self-reported co morbidities of chest diseases like pulmonary tuberculosis, bronchogenic carcinoma or past history of pneumonectomy, lobectomy, or thoracotomy. Patients unable to co-operate due to severe acute or chronic physical conditions like congestive heart failure (stage III or IV), unstable angina, other malignancies that is likely to cause death within 3 years, and patients with already diagnosed psychiatric illnesses and those in acute or chronic confusion state. Substance dependence except nicotine. Those patients with asthma exacerbation in the last 1 month were excluded from the study.

Study duration

The study was conducted from July 2018-June 2019, for 1 year.

Sample size

A consecutive series of 150 patients with stable asthma who satisfy the inclusion and exclusion criteria will be recruited in the study.

Sample size is calculated assuming the prevalence of 9% for depression and 11% for anxiety for a precision factor of 5, using the formula $4pq/d^2$.

Methodology

This study was conducted after obtaining approval by the medical ethics and research committee of the institution. All patients with stable asthma using symptom control tool, GINA which asks about difficulty sleeping, daytime symptoms, and activity limitation and use of relievers >2 times /week due to asthma in the previous 1 month, attending the department of respiratory medicine, GMC, Kannur, Kerala, India satisfying inclusion criteria will be approached for written informed consent.[8,9]

Initially a detailed history which includes exposure to risk factors, past history, addictions and family history was taken. Spirometry was done using turbine flow spirometer, and the best of three consecutive readings according to the American thoracic standards, before and 15 mins after the inhalation of 200 mcg salbutamol was taken. Disease severity will be classified according to the GINA guidelines (2018) by clinical, radiological and spirometric evaluation.[8] Severity of air flow obstruction was classified based on FEV1 values.

The socio demographic details and the relevant clinical details was collected using the socio demographic Proforma prepared specifically for the study. Quality of life of these patients was then assessed with standardized Asthma quality of life questionnaire-Malayalam version-AQLQ(S). AQLQ (S) questionnaire is the version of questionnaire that is most commonly used today. In this questionnaire all the activity questions are generic (i.e., the same for all patients). This makes completion much easier and quicker. It contains 32 questions, 11 questions were activity limitation, 12 for symptoms, 5 for emotional function, 4 for environmental stimuli. AQLQ (S) is available in both self and interviewer administered formats. We used the self-administered format.

These patients were then screened using hospital anxiety and depression scale (HADS). For psychological status,

the 14-item HADS 23 was used, which is ideally suited for clinical settings because items avoid any reference to physical symptoms. Seven questions relate to anxiety and seven to depression, with total scores for both subscales in the range of 0-21. A value of 7 or less is interpreted as non-clinical, 8-10 as indicating possible clinical relevance, and values of 11 or higher as indicating important relevance. Those patients with HAD-D score of 8 or higher and HAD-A score of 8 or higher was referred to psychiatry department for further evaluation.

Statistical analysis

Descriptive statistics was used to assess frequency, percentage, mean and standard deviation. Categorical variables were analyzed using Chi-square or Fisher's exact test and continuous variables was analyzed using student's t test. P<0.05 considered clinically significant. For statistical analysis, patients were grouped into asthma with depression alone, with anxiety alone, with both, without both. Socio demographic and clinical variables compared to find out association of asthma with anxiety and depression. Associations of anxiety and depression on HADS at varying levels of disease severity and quality of life assessed by appropriate statistical measures.

RESULTS

Total 150 patients included in the study.

Age

The most common age group was between 50-59 years (49 patients 32%). The mean age group was 46.24 with a SD of 11.006.

Gender

The 81 patients (54%) were females and 69 (46%) males.

Marital status

146 patients (97%) were married, the rest including widowed and single

Religion

Our study had a predominance of Hindu population

Residential area

Most of patients were from rural area 105 patients (70%).

Education

Among the 150 patients the majority were educated most (51 patients) of them had secondary education (34%), with just 1.3% of them being illiterate.

Socio-economic status

Most of the patients were low class socio-economic status-96 patients-64%.

Occupation

The 48 (32%) patients were unemployed (mainly homemakers), most (37) of the employed were semiskilled (drivers, watchmen, etc.) (24%).

Age of onset of asthma

Among our patients we found that the most common age of onset of asthma symptoms was between the age group of 20-30 years (36 patients, 24%).

Grade of dyspnoea

Most of the patient (49.3%) had grade 1 dyspnea. No baseline dyspnea for 34.7%.

Table 1: Clinical profile.

Variables	Number	Percentages (%)
Symptoms		
Cough	115	76
Dyspnoea	141	94
Chest x ray		
Normal	150	100
Treatment received		
No treatment	20	13.3
Inhaled steroids	89	59.3
Laba	2	1.3
Saba	2	1.3
Ics + oral steroids	3	2
Steroids + saba + bronchodilators	6	4
Ics + leukotriene inhibitors	28	18.7
Co-morbidities		
No comorbidities	77	51
Co-morbidities	73	49
Severity of asthma		
Well controlled	126	84
Partial controlled	24	16
Uncontrolled	0	0

Co-morbidities

Majority of patients in our study did not have any co-morbidities (51%) 115 (76%) of the asthmatics had cough, and about 141 (94%) of them had dyspnoea. In patients who had dyspnoea about 74 patients (49.3%) had dyspnoea of grade 1, 52 (34.7%) patients did not have baseline dyspnoea. The 136 patients (90%) on regular follow up.

In our study about 126 patients had well controlled symptoms, and 24 patients were moderately controlled. About 89 (59%) patients were using inhaled steroids, out of which 49 patients (32%) were using low dose ICS-100 to 200 mcg, 39 (26%) patients were using high dose ICS, 27 patients (18%) of the patents were using ICS with antileukotriene antagonists. The 81 patients (54%) had a normal BMI between 18.5 to 24.9. About 2 patients were underweight, 10 (6.7%) patients had a BMI >30, the rest 51 patients were overweight. 104 (69%) patients were non-smokers, 26 patients (13%) being ex-smoker.

Quality of life and increasing age

There was a negative and weak co-relation between the increasing age and the quality of life, using Spearman's rank correlation coefficient (-0.167, p=-0.041).

HAD scores

Anxiety scores

Among our patients with asthma about 22% had anxiety symptoms, 117 patients (78%) did not have anxiety.

Depression scores

Among our patients with asthma about 22% had depression symptoms, 117 patients (78%) did not have symptoms of depression.

Prevalence of depression and anxiety

The prevalence of both depression and anxiety using HAD score was 48.6% among stable asthmatics as observed in our study.

The 77 (51.4%) patients did not have any significant psychiatric symptoms (HAD score <8), 47 (31%) patients required further psychiatric consultation (HAD score >11), and 17.3% had possible psychiatric (HAD score 8-11)

Among them 10 patients had only anxiety symptoms, 10 patients had only depression symptoms, 23 patients had symptoms of both depression and anxiety.

Relationship between bronchial asthma symptom control, FEV1 and degree of depression and anxiety

Among patients with anxiety about 9% of them had an FEV1 <50%, while the rest had an FEV1 >50%. Among the total patients with depression about 9% only had an FEV1 <50%, the rest had an FEV1 >50%. There was no statistical significance in the occurrence of depressive symptoms and patients with FEV1 values,

Asthma control and anxiety: There was significant relationship between the level of asthma control and anxiety symptoms in our patients (p=0.002).

Asthma control and depression: There was a significant relationship between the level of asthma control and the level of depression in asthma patients according to our study (p=0.01).

Quality of life in stable asthma patients: The mean AQLQ score of 4.732±1.29, the mean AQLQ score among patients with no depression or anxiety symptoms was 5.216±1.09. The mean AQLQ among patients with anxiety, depression and both were 3.86±1.24, 3.43±1.21, 3.41±0.56 respectively.

Our study found that the mean AQLQ score was lower in patients with psychiatric symptoms than those with no psychiatric symptoms

Table 2: Quality of life in stable asthma patients.

AQLQ score	Mean	SD	Median	Inter-quartile range
AQLQ score	4.732	1.29	4.91	2.4
AQLQ score in PTS with no A and D	5.216	1.09	5.56	1.73.41
AQLQ score in anxiety	3.86	1.24	3.43	2.2
AQLQ score in depression	3.43	1.21	2.96	1.4
AQLQ score in both A and D	3.41	0.56	3.4	0.4

Different determinants of AQLQ score

The mean value of the different determinants of AQLQ score were almost the same with the mean AQLQ score being 4.372±1.29.

Table 3: Different determinants of AQLQ score.

Variables	Mean	SD	Median	Inter-quartile range
Activity limitation	4.86	1.35	5.18	2.36
Symptoms	4.73	1.52	5.08	2.80
Emotional	4.96	1.51	5.00	3
Environment	4.18	1.53	4.25	2.25

DISCUSSION

Asthma, as a chronic disease, has been shown to reduce quality of life in general, with higher levels of severity leading to greater decrements in quality of life.[10,11] Compromised mental health has been shown to reduce quality of life in asthmatics, and specifically anxiety and depression have additional negative effects.[12-14] In our study, we observed that out of 150 patients, 81 (54%) were females, similar female predominance was seen in a study done by Giorgio et al which showed a majority of females of about 58%.[15] Adams et al showing more of

females aged 18-24 years (p<0.01).[6] The mean age group in our study was 46.2 (SD-11), study done by Giorgio et al showed a of 39.2 and a SD of 16.1.[15] Another Egyptian study, done by Taghreed et al showed a mean age group among asthmatics as 38.4±11.7.[7]

We did not find a level of significance in the relationship between the socio-demographic factors (age, gender, occupation, education,) and anxiety, depression symptoms among patients. However, a study done by Al Dubai et al showed factors that were associated significantly with anxiety were patient's age and newly referred cases. Factors associated significantly with depression were patient's age, race, monthly household income, and employment status.[16]

In our study. There was negative correlation between age and AQLQ score (p=0.041). There was no significant correlation between other socio-demographical and clinical factors (gender, area of residence, religion, occupation, socioeconomic status, education, co-morbidities, symptoms, current medication) and AQLQ scores in our patients. In contrast to our study Uchmanowicz et al showed sociodemographic variables that correlated positively with QoL in all domains of the AQLQ which were professional activity and higher education level of respondents. Factors that negatively influenced the AQLQ domains were older age and lack of professional activity.[17]

In our study, the relationship between the asthma control and anxiety and depression symptoms were significant (p=0.002 and 0.011 respectively) similar findings were also seen in a study done by Çoban et al which showed that patients with adequately controlled asthma had higher quality of life and lower HAD anxiety and depression scores.[17] Çoban et al also showed significant negative correlation was found between HAD anxiety and depression scores, and AQLQ and ACT scores (p<0.001).[18]

It has been estimated that about 50% of asthmatic patients suffer from serious psychiatric disorders.[19] In our study we found the prevalence of depression and anxiety among asthmatics to be 22%. In comparison to others studies which showed higher prevalence Asnaashari et al showed a prevalence of 66% Wang showed that 70% of asthmatic patients have some degrees of anxiety and/or depression.[20,21] Other studies found that depression and anxiety are 6 times more prevalent in asthmatics when compared with the general population.[22] A Canadian survey with psychiatric interview, anxiety was more prevalent in asthmatics when compared to depression (12% versus 8%).[23]

We found that there was significant association between the control of asthma with AQLQ Score among our patients (p=0.01). Valory et al also found in their study that 50% of the patients had partially controlled or uncontrolled asthma, with significant impact on quality of life.[24] A study conducted by Chen et al showed that an inverse relationship was observed between the number of asthma control symptoms and quality of life. Specifically, poorer control at baseline predicted worse AQLQ and EQ-5D scores at follow-up. Asthma control remained an independent predictor of disease-specific quality of life and general health in multivariate models and was a better longitudinal predictor of health status than asthma severity at baseline.[25]

Our study did not show a relationship between the severity of airway obstruction (FEV1) and anxiety and depression symptoms among patients. Another study by Rimington et al showed a co-relation between lung function and FEV1, but was relatively weak.[26]

Our study showed a mean AQLQ score of 4.732±1.29, the mean AQLQ score among patients with no depression or anxiety symptoms was 5.216±1.09. The mean AQLQ among patients with anxiety, depression and both were 3.86±1.24, 3.43±1.21, 3.41±0.56 respectively.

The mean AQLQ score among patients with well controlled asthma 4.9±1.21 (median-5.26), among patients with moderately controlled asthma was 3.65±1.21 (median-3.4). The results of another study by Mancuso et al showed that asthma patients with more depressive symptoms had worse functional status and worse health-related quality of life than asthma patients with similar disease activity but fewer depressive symptoms.[27]

Limitations

Sample was obtained from a single centre, thereby selection bias is possible. As our study was a cross-sectional study, the causal relationship could not be analysed. Small sample size and other parameters like family history of asthma or psychiatric illness was not obtained. Usage of beta-blockers, which may cause anxiety like symptoms were not included in this study.

CONCLUSION

Our study managed to detect depression and anxiety among asthmatic patients presenting to our department, and also helped in timely intervention of these patients. We found that asthma symptom control has statistically significant correlation with anxiety and depression.

We also found that the mean quality of life was low in patients with stable asthma, with further decrease in the quality of life occurring in those with psychiatric symptoms. The presence of uncontrolled asthma symptoms, symptoms of depression and anxiety are all predictors of poor quality of life. Anxiety and depressive symptoms can in turn affect the treatment adherence and control of asthma in such patients.

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