



A study on prevalence of psychiatric comorbidities occurring in bronchial asthma patients

First Author: Dr Arun Seetharaman, Professor, Department of Psychiatry, Sri Lakshmi Narayana Institute of Medical Sciences, Kudapakkam Post, Villianur, Puducherry 605502, India.

Second and Corresponding Author: Dr Nivethika V T, Post Graduate, Department of Psychiatry, Sri Lakshmi Narayana Institute of Medical Sciences, Kudapakkam Post, Villianur, Puducherry 605502, India.

Email: nivethikatamilmani94@gmail.com

Third Author: Dr Ramkumar, Assistant Professor, Department of Psychiatry, Sri Lakshmi Narayana Institute of Medical Sciences, Kudapakkam Post, Villianur, Puducherry 605502, India.

Fourth Author: Dr Agila C., Assistant Professor, Department of Psychiatry, Sri Lakshmi Narayana Institute of Medical Sciences, Kudapakkam Post, Villianur, Puducherry 605502, India.

Received Date: 05/04/2023 **Revised Date:** 14/05/2023 **Published Date:** 20/06/2023

Abstract

Background: Asthma is one of the most prevalent respiratory diseases in the world, and several of the variables associated with the illness may increase the susceptibility to psychiatric illnesses. This study was conducted to assess the prevalence of various psychiatric co-morbidities in the bronchial asthma patients. **Methodology:** It is an observational study conducted in 90 patients of bronchial asthma. Psychiatric co-morbidities are assessed by using a pre-designed short-structured questionnaire with a component of Mini international neuropsychiatric interview. **Results:** The male predominant study showed an overall prevalence of 74.4% of psychiatric comorbidities in the bronchial asthma patients. The most prevalent comorbidities seen in this study were major depressive disorder (61%), panic disorder (50%), followed by melancholic depression (30%), mixed anxiety disorder (30%), premenstrual dysphoria (25.5%). **Conclusion:** Our study shows there is a high prevalence of psychiatric co-morbidities in patients of bronchial asthma. The treatment of asthma should be a multidisciplinary approach including medical treatment of asthma and psychiatric evaluation to prevent psychiatric co-morbidity or its early management.

Keywords: Bronchial Asthma, Psychiatric, Comorbidities, depression, anxiety.

Introduction: Asthma, a well-known and prevalent respiratory disorder, which affects 300 million individuals worldwide, is characterised by persistent lower respiratory tract irritation. This is demonstrated by the rise in airway hyperresponsiveness, which causes frequent attacks of coughing, wheezing, and dyspnea. Mast cells, eosinophils, and their mediators all contribute significantly to the inflammatory reaction in atopic patients. [1] In contrast, it is

unclear what causes non-atopic asthma. Over the past 30 years, the prevalence of asthma has increased in wealthy nations, but it currently seems to have stabilized, affecting 10-12% of adults. [2]

Asthma risk factors have a wide range of distributions, which may lead to disparities in its prevalence. Sometimes, these contributing circumstances may make people more susceptible to various psychiatric problems. [3] Since asthma cannot be cured, it either makes it harder to carry out daily tasks or results in more hospitalizations. The patient's ability to go about their everyday lives has been known to be hindered by the chronicity of asthma, predisposing them to psychiatric issues, which in turn contributes to the growth in bronchial asthma morbidity. [4] Asthma patients typically exhibit psychiatric comorbidities such as substance use disorder, anxiety, and depression. Asthma and mental disease appear to have a complex and reciprocal interaction. [5]

Asthma patients experience a large amount of stress as a result of the symptom complex. There are numerous references to anxiety and despair. Patients with asthma who also had psychiatric co-morbidities experienced increased morbidity and decreased quality of life. [6] Different comorbid mental conditions and stress increase oscillatory respiratory resistance significantly without concurrent increases in ventilator or autonomic activity, leaving the patient at risk to exacerbations of asthma. It can have an impact on asthma management, the perception of symptoms, and quality of life, which significantly increases healthcare use and costs. [7] It may be possible to treat asthma and associated psychiatric problems more effectively and adequately by evaluating asthma patients for co-morbid psychiatric conditions.

So, the current study was planned to assess the relationship between asthma and the psychiatry comorbidities.

Materials And Methods

This is an observational study conducted in 90 follow-up patients diagnosed with bronchial asthma attending general medicine or respiratory medicine department of a tertiary care centre, Chennai. Patients aged between 18 to 60 years were included in the study, and those with past history of psychiatric disorders were excluded from the study. Using the Cochran's formula, the minimum sample size required for the study was calculated to be 90. Sample size $(n) = ZPQ/LxL$, where, $Z = 1.96$ at a confidence interval of 95%, and the prevalence of psychiatric comorbidities from a previous study measured at 34, and $Q = 100 - P$, and L is measured at 10% of P . [5]

After obtaining the informed consent and ethical clearance, a semi structured, modified questionnaire with socio-demographic profile, and the M.I.N.I. plus questionnaire (Mini-International Neuropsychiatric Interview) for the diagnosis of psychiatric disorder was used to collect data from the patients. The M.I.N.I. Plus questionnaire was divided into modules, each of which was recognized by a letter and corresponded to a diagnostic category. At the start of each diagnostic module (except for the psychotic disorders module), a gray box displayed screening questions according to the primary criteria of the disorder. Diagnostic boxes, at the conclusion of each module allow the doctor to note if the diagnostic criteria was satisfied.

Data entry was done in Microsoft Excel and the analysis was conducted using IBM SPSS, version 21. Categorical variables were expressed as frequencies and percentage, whereas continuous variables are expressed in means and standard deviations. The association of categorical variables was carried out using Chi square test or Fischer Exact test. The

comparison of continuous variables was done using independent Student t test. A p value of < 0.05 was considered significant.

Results

The current study included patients ranging in age from 18 to 60 years old, with an average age of 34.37 ± 10.77 years. This a slightly male predominant study with male to female ratio of 1.04, and the distribution is not significant statistically in both groups. One patient in our study was from the upper class, 29 (32.21%) from the middle class, and the majority (66.66%) of the patients came from the lower class. (Table 1)

Table 1: Frequency distribution of Demographic variables in the study (n=90)

Variable	Frequency	Percentage
Gender		
Male	46	51.1%
Female	44	48.8%
Age		
18-25	25	27.7%
26-35	27	30%
36-45	25	27.7%
46-55	10	11%
55-60	3	3.33%
Socio-Economic Status		
Upper	1	1.11%
Upper Middle	5	5.55%
Lower Middle	24	26.6%
Upper Lower	40	44.4%
Lower	20	22.2%

In the current study, there were 12 recurrent and 33 current major depressive patients. This association of recurrent episodes in the bronchial asthma is found to be statistically significant. Similarly, the mood disorders were seen in 10 asthmatics as a form of current disease, and only 2 of the subjects showed past mood disorders due to other diseases ($P < 0.005$). Substance induced mood disorder is distinguished with 13 of the asthmatics (14.4%) showing past causes compared to the 5 current disorders. This is partially significant in the current study. (Table 2)

Table 2

Psychiatric Diagnosis	Frequency	Percentage	P value
Major Depressive disorder			
Current	33	36.6%	0.0003*
Recurrent	12	13.3%	
Mood disorder			
Current	10	11.1%	0.016*
Past	2	2.2%	
Substance induced mood disorder			
Current	5	5.55%	0.05*
Past	13	14.4%	
MDE with melancholic			
Current	12	13.3%	0.543
Past	15	16.6%	

Panic disorder Present	45	50%	-
Social Phobia Present	5	5.55%	-
Somatization disorder Lifetime	6	6.6%	0.021*
Current	19	21.1%	
Premenstrual dysphoric disorder Present	23	25.5%	-
Mixed anxiety disorder Present	27	30%	-

*P-value less than 0.05 is considered significant.

MDE with melancholic was not statistically significant with its past and current disease scenarios, but as a whole 27 of the asthmatics suffer from it. Panic disorder is seen among 45 of the asthmatics, premenstrual dysphoria in 23 of the subjects, and mixed anxiety disorder in 27 bronchial asthma patients. Social phobia is the least seen psychiatric disorder with only 5 asthmatics experiencing it. Somatization disorder is seen currently in 19 patients, and the lifetime disease was seen in 6 patients. This association was found to be statistically significant (P=0.021).

Discussion

One of the most prevalent respiratory illnesses is asthma, and a number of its comorbidities may make someone more likely to experience mental health issues later in life. Both asthma and mood problems frequently co-occur and may share a same etiology. [8] Asthma patients are more likely to have concurrent disorders as they age. The age of the participants in the current study was 34.3 years on average. According to the Singh DK et al. 2020 study, those over 60 who have asthma are more prone to develop psychological co-morbidity. [9] There are differences between the sexes in asthma incidence, prevalence, and severity, with adult females predominating. Similar to the current study, Singh DK et al included 110 individuals with stable bronchial asthma, of which 52% were men and 48% were women.

The present study discovered that asthma patients with lower socioeconomic status are more likely to have mental co-morbidities, which is in line with study conducted by Lin et al. [10] According to the Global Burden of Disease study, major depressive disorder, one of the most prevalent and incapacitating mental diseases in the world, is the fourth most common cause of disability. [11] In the current study, there were 12 people with recurrent major depression and 3 patients who were currently experiencing major depression. This finding is also statistically significant. According to another research in 2021, 85 individuals (30.7%) had a risk score for major depressive disorder. They further noted that asthma is an unusual chronic medical condition that has been linked to anxiety and mood disorders. [12]

In this study, two patients and ten subjects both had histories of mood problems brought on by underlying medical diseases. Labor et al found significant associations between concurrent hypertension, the degree of asthma management, and mental problems and both asthma and infection-induced asthma. [13] Substance-induced mood disorders are barely noteworthy in our investigation, but a study by Bender et al found that although mental health problems are common in asthma patients, they typically go unrecognised and untreated. Additionally, according to the statistics, mental disorders are not usually associated with asthma treatments, at least not in the population that was studied. [14]

Through hyperventilation, they may directly aggravate asthmatic symptoms in panic disorder patients. In our study, a significant proportion of participants (n=45) experienced panic disorder. According to Carr et al., respiratory factors have a substantial role in panic disorder, which could explain this in part. [15] There are 25 people with somatoform diseases, including 19 who are currently feeling pain. According to Alzaabi et al., asthma sufferers need psychotherapy in addition to their asthma drugs in order to get better results and receive better care. [16] There are about 23 persons who have both premenstrual dysphoric disorder and bronchial asthma. In a research by Pereira-Vega et al, premenstrual asthma and the premenstrual worsening of dysphoric symptoms as well as some edematous symptoms, such as abdominal and mammary tightness and a feeling of swelling, are directly related. [17]

Conclusion

According to the findings of the current investigation, people with asthma had significantly higher rates of psychiatric co-morbidities than people without bronchial asthma. This study also emphasizes the necessity of simultaneously providing asthma treatment and mental health care. Consistent asthma therapy may lessen the chance of neuropsychiatric comorbidities developing in asthma patients. The links between cognitive and emotional events and asthma may be better understood through research on the respiratory, immune, and brain responses to stress. Additionally, additional research may offer both pharmaceutical and non-pharmacological asthma treatments and reveal connections between the central and peripheral effects.

References

1. Cukic V, Lovre V, Dragisic D, Ustamujic A. Asthma and Chronic Obstructive Pulmonary Disease (COPD) - Differences and Similarities. *Mater Sociomed.* 2012;24(2):100-105. doi:10.5455/msm.2012.24.100-105
2. Dharmage SC, Perret JL, Custovic A. Epidemiology of Asthma in Children and Adults. *Front Pediatr.* 2019;7:246. doi:10.3389/fped.2019.00246
3. Subbarao P, Mandhane PJ, Sears MR. Asthma: epidemiology, etiology and risk factors. *CMAJ.* 2009;181(9):E181-E190. doi:10.1503/cmaj.080612
4. Kewalramani A, Bollinger ME, Postolache TT. Asthma and Mood Disorders. *Int J Child Health Hum Dev.* 2008;1(2):115-123.
5. Scott KM, Von Korff M, Ormel J, et al. Mental disorders among adults with asthma: results from the World Mental Health Survey. *Gen Hosp Psychiatry.* 2007;29(2):123-133. doi:10.1016/j.genhosppsy.2006.12.006
6. de Boer GM, Houweling L, Hendriks RW, Vercoulen JH, Tramper-Stranders GA, Braunstahl GJ. Asthma patients experience increased symptoms of anxiety, depression and fear during the COVID-19 pandemic. *Chron Respir Dis.* 2021;18:14799731211029658. doi:10.1177/14799731211029658
7. Ritz T. Airway responsiveness to psychological processes in asthma and health. *Front Physiol.* 2012;3:343. doi:10.3389/fphys.2012.00343
8. Stubbs MA, Clark VL, Gibson PG, Yorke J, McDonald VM. Associations of symptoms of anxiety and depression with health-status, asthma control, dyspnoea, dysfunction breathing and obesity in people with severe asthma. *Respiratory research.* 2022;23(1):341
9. Singh DK, Mehrotra A, Anand S, Singh GV, Gupta AK, Kumar S. Assessment of psychiatric co-morbidities in patient of bronchial asthma attending a tertiary medical centre (Multicentric study). *Journal of Family Medicine and Primary Care.* 2020;9(11):5741.

10. Lin P, Li X, Liang Z, Wang T. Association between depression and mortality in persons with asthma: a population-based cohort study. *Allergy, Asthma & Clinical Immunology*. 2022;18(1):1-7.
11. COVID-19 Mental Disorders Collaborators. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet* [Internet]. 2021;398(10312):1700–12. Available from: [http://dx.doi.org/10.1016/S0140-6736\(21\)02143-7](http://dx.doi.org/10.1016/S0140-6736(21)02143-7).
12. Caballero-Domínguez CC, Pedrozo-Pupo JC, Campo-Arias A. Risk of a major depressive episode in asthma and copd patients amidst colombian SAR-COV-2 Confinement. *Psychiatria Danubina*. 2021;33(1):101-6
13. Labor M, Labor S, Jurić I, Fijačko V, Grle SP, Plavec D. Mood disorders in adult asthma phenotypes. *Journal of Asthma*. 2018;55(1):57-65.
14. Bender BG. Depression symptoms and substance abuse in adolescents with asthma. *Ann Allergy Asthma Immunol*. 2007;99(4):319–24.
15. Carr RE, Lehrer PM, Hochron SM. Panic symptoms in asthma and panic disorder: a preliminary test of the dyspnea-fear theory. *Behaviour Research and Therapy*. 1992;30(3):251-61.
16. Alzaabi A, Najib M, Samaha H, Jaiganesh T, Kassem A, Abbas A. Expert Opinion for the Management of Severe Asthma in Adults in the Gulf Region. *Current Respiratory Medicine Reviews*. 2022;18(3):201-7.
17. Pereira-Vega A, Sánchez JL, Gil FL, Maldonado JA, Bravo JM, Ignacio JM, et al. Premenstrual asthma and symptoms related to premenstrual syndrome. *Journal of Asthma*. 2010;47(8):835-40.