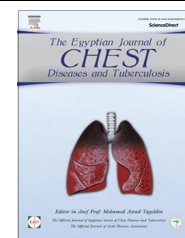




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ORIGINAL ARTICLE

Depression, anxiety, distress and somatization in asthmatic patients



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KEYWORDS

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Abstract *Objective:* There is evidence that asthma is associated with an increase in psychiatric disorders (depression, anxiety, distress and somatization). The purpose of this study was to assess the presence of psychiatric disorders in adult asthmatic patients and to examine its relationship to asthma control.

Methods: A cross-sectional case-control study was conducted on 134 subjects (65 healthy volunteers, 69 asthmatic patients). The asthmatic patients were divided into 3 groups, according to GINA guidelines (GINA, 2010) [2] criteria for asthma control, and were subsequently compared to control groups in terms of demographic, clinical, and spirometric data, as well as The Four-Dimensional Symptom Questionnaire to assess psychological symptoms.

Results: The sample was predominantly female 49 patients (71%). Of the 69 patients, 32 (46%) were classified as having uncontrolled asthma. Somatization, anxiety, depression, distress levels were higher among asthma patients compared to control and the difference was statistically significant ($p < 0.05$). High levels of somatization and distress were found among uncontrolled asthma cases compared to partially and controlled cases with no statistically significant difference ($p > 0.05$ and $p > 0.05$, respectively). High levels of anxiety were found among uncontrolled and partially controlled asthma cases compared to controlled cases with no statistically significant difference ($p > 0.05$ and $p > 0.05$, respectively). There was a negative weak correlation between psychiatric symptoms and age, duration of asthma and forced expiratory volume in the first second ($p > 0.05$).

Conclusions: Asthmatic patients are at high risk of psychiatric problems, particularly depression, anxiety and somatization. Asthmatic patients need psychotherapy besides their medication of asthma to obtain better asthma out come and management.

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Abbreviations: 4DSQ, the four-dimensional symptom questionnaire; FEV1, forced expiratory volume; ANS, autonomic nervous system; HPA, hypothalamic pituitary adrenal axis.

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Introduction

Bronchial asthma is a chronic inflammatory condition which is considered as a major cause of disability and death [1]. The prevalence of asthma has been increased in recent decades; it affects about 300 million people world-wide which brings about high socioeconomic costs and an increase in mortality and morbidity [2]. The disease is characterized by sudden and unexpected attacks of shortness of breath, thus asthma attacks are a real threat for life in these patients [3].

It makes sense that asthma significantly affects psychological health because its impact on activities, sleep and social life of patients. On the other hand, psychological factors may be a risk factor for exacerbation of this disorder [4].

Asthma presents the most profound links between psychological, social, biological and physiological factors [5]. More recent hypotheses regarding the link between asthma and psychological factors are describing asthma as a classic psychosomatic disorder caused by specific psychological conflicts [6].

Two-thirds of patients with asthma are anxious during the acute attack. Anxiety symptoms in asthmatics have been revealed as strong predictors of respiratory illness in those patients [7].

On the other hand, some negative emotions (fear, panic, anger, and depression) are involved in a fluctuating process of bronchoconstriction of the airways, leading to worse crises of asthma [8]. But, these emotions are not severe enough to be classified as psychiatric disorders, but can lead to initiation or worsening of asthma, directly by psychophysiological effects or indirectly by neglecting self-management of the illness. Conversely, these emotions can also be worsened by asthma itself [9]. Depression is also associated with autonomic dysregulation leading to a cholinergic or vagal bias (i.e., vagal over sympathetic reactivity) which increases airway instability in asthma [10]. Stress exposure increases the risk of developing asthma. In some patients, stress is the essential trigger for asthma attacks [11].

Patients and methods

This study was across-sectional case-control conducted on 134 subjects (65 healthy volunteers, 69 asthmatic patients) who were recruited from outpatient clinic of the Mansoura University Hospitals, from April 2014 to December 2014. The subjects were included after providing a written informed consent.

The asthmatic patients were divided into 3 groups, according to GINA guidelines [2] criteria for asthma control.

Group A: included 69 asthmatic patients.

Group B: included 65 healthy volunteers.

Group A was divided into 3 groups.

Group I: included 32 uncontrolled asthmatic patients.

Group II: included 10 partially controlled asthmatic patients.

Group III: included 27 controlled asthmatic patients.

All study subjects were considered eligible for the study if they were confirmed to the following criteria.

Inclusion criteria

1. Confirmed asthmatic patient.
2. Non-smoker.
3. No exacerbation, chest infection in the last month.
4. No other respiratory disorders like tuberculosis, cystic fibrosis, bronchiectasis.
5. No other systemic disease hepatic, renal, diabetic, malignancy, autoimmune diseases.
6. Pulmonary function and answering the questionnaire on the same day.
7. No history of psychiatric disorder.

This study was designed to assess common psychological symptoms (anxiety, depression, stress and somatization), age, sex, duration of asthma and pulmonary function (forced expiratory volume (FEV1)) in asthmatic patients.

Study definition

Distress

Characteristic distress symptoms are worry, irritability, tension, listlessness, poor concentration, sleeping problems and demoralization.

Depression and anxiety

Because distress symptoms virtually always accompany mood and anxiety disorders, it seems difficult to differentiate distress from depression and anxiety. When distress is separated from depression we are left with anhedonia and depressive thoughts. These symptoms are considered to represent the core symptomatology of major depression. When we separate distress from anxiety, we are left with irrational fears, anticipation anxiety and avoidance behavior.

Somatization

Somatization is a tendency to experience medically unexplained somatic symptoms, to attribute them to physical illness, and to seek medical help for them [12].

The Four-Dimensional Symptom Questionnaire (4DSQ)

The 4DSQ is a self-report questionnaire comprising 50 items distributed over four scales. The items are worded as questions similar to those that can be asked in everyday primary care practice. The reference period is "the past week". For example,

Table 1 Psychiatric symptoms in asthma patients and control.

	Asthma patients <i>N</i> = 69	Control <i>N</i> = 65	<i>p</i> value
	Group A	Group B	
	Median (min–max)		
Somatization	17(0–33)	8(0–30)	< 0.001
Anxiety	9(0–23)	4(0–20)	< 0.001
Depression	3(0–12)	1(0–12)	< 0.001
Distress	16(0–34)	10(0–32)	< 0.01

item 26 reads “During the past week, did you feel easily irritated?” The 4DSQ does not contain any positive affect questions, nor any other “reversed” worded questions. The response categories are also worded as normal answers to clinical questions: “no”, “sometimes”, “regularly”, “often”, “very often or constantly”.

In order to arrive at scale scores, the responses are scored as 0 for “no”, 1 for “sometimes” and 2 for the other response categories, and the item scores are summated to scale scores. The distress scale contains 16 items and has a score range of 0–32, the Depression scale contains 6 items and has a range of 0–12, the Anxiety scale contains 12 items and has a range of 0–24, and the Somatization scale contains 16 items and has a range of 0–32 [12].

The 4DSQ is available as a Dutch and an English version [13]. We took the English version after approval from the author. The Arabic version was obtained through a procedure of translation into Arabic and back-translation into English.

Statistical analysis

- The results are expressed as means and standard deviations or as medians and interquartile ranges. Categorical variables were compared using the Chi-square test or Fisher’s exact test. Depending on the distribution, continuous variables were compared by the unpaired *t*-test or Mann–Whitney test. Values of $p < 0.05$ were considered statistically significant. Statistical analyses were performed using the statistical freeware R, version 2.10.1 (R Development Core Team, 2009).

- Internal consistency reliability analysis was Cronbach’s alpha = 0.74.

Results

All study subjects were age and sex matched. The mean age of asthmatic patients **Group A** was 31.9 ± 9.4 , while the control group **Group B** was 33.6 ± 8.2 .

49(71%) of **Group A** (asthmatic patients) were females, while 50(77%) of **Group B** (control subjects) were females.

Somatization, anxiety, depression, distress levels were higher among asthma patients compared to control and the difference was statistically significant ($p < 0.05$) (Table 1).

Low grade depression levels were noticed among controlled asthma cases, however total scores did not differ significantly between them ($p > 0.05$) (Table 2).

The highest levels of distress were noticed among uncontrolled asthma patients compared to partially and controlled cases with no statistically significant difference ($p > 0.05$) (Table 3).

The highest levels of anxiety were found among uncontrolled and partially controlled compared to controlled asthma cases with no statistically significant difference ($p > 0.05$) (Table 4).

The highest levels of somatization were noticed among uncontrolled asthma patients compared to partially and controlled cases with no statistically significant difference ($p > 0.05$) (Table 5)

Table 2 Depression among studied asthmatic patients.

	Un controlled $N = 32(46\%)$ Group I	Partially controlled $N = 10(15\%)$ Group II	Controlled $N = 27(39\%)$ Group III	<i>p</i> value
Low	26(81.2)	9(90)	25(92.6)	> 0.05
Moderate	6(8.8)	1(10)	2(7.4)	
Total median (min–max)	3(0–12)	2(0–12)	3(0–10)	> 0.05

Table 3 Distress symptoms among studied asthmatic patients.

	Un controlled $N = 32(46\%)$ Group I	Partially controlled $N = 10(15\%)$ Group II	Controlled $N = 27(39\%)$ Group III	<i>p</i> value
Low	9(28.1)	5(50)	9(33.3)	> 0.05
Moderate	11(34.4)	3(30)	11(40.7)	
High	12(37.5)	2(20)	7(25.9)	
Total median (min–max)	17(0–34)	13(5–31)	14(0–27)	> 0.05

Table 4 Anxiety symptoms among studied asthmatic patients.

	Un controlled $N = 32(46\%)$ Group I	Partially controlled $N = 10(15\%)$ Group II	Controlled $N = 27(39\%)$ Group III	<i>p</i> value
Low	5(15.6)	3(30)	8(29.6)	> 0.05
Moderate	4(12.5)	1(10)	3(11.1)	
High	23(71.9)	6(60)	16(59.3)	
Total median (min–max)	9(0–23)	9(2–20)	6(1–18)	> 0.05

Table 5 Somatization symptoms among studied asthmatic patients.

	Un controlled <i>N</i> = 32(46%) Group I	Partially controlled <i>N</i> = 10(15%) Group II	Controlled <i>N</i> = 27(39%) Group III	<i>p</i> value
Low	4(12.5)	3(30)	9(33.3)	> 0.05
Moderate	18(56.3)	4(40)	11(40.7)	
High	10(31.3)	3(30)	7(25.9)	
Total median (min–max)	17.7 ± 7.04	15.5 ± 6.9	14.5 ± 8.4	> 0.05

Table 6 Correlation between psychiatric symptoms and clinical characteristics of asthma patients.

		Asthma duration	Age	FEV1
Somatization	r	-.045	-.078	-.042
	p	> 0.05	> 0.05	> 0.05
Anxiety	r	-.060	-.200	.026
	p	> 0.05	> 0.05	> 0.05
Depression	r	.001	-.107	.071
	p	> 0.05	> 0.05	> 0.05
Distress	r	.008	-.061	-.010
	p	> 0.05	> 0.05	> 0.05

There was a negative weak correlation between psychometric symptoms and age, duration and FEV1 ($p > 0.05$) (Table 6).

Discussion

Psychological factors may influence the symptoms and management of asthma, and numerous pathways may contribute to the links between asthma and psychiatric disease states such as depression [14].

In this study, we found that somatization, anxiety, depression, distress levels were higher among asthma patients compared to control and the difference was statistically significant ($p < 0.05$).

High levels of somatization were found among uncontrolled asthma cases compared to partially and controlled cases with no statistically significant difference ($p > 0.05$). Also, high levels of anxiety were found among uncontrolled and partially controlled asthma cases compared to controlled cases with no statistically significant difference ($p > 0.05$). Low grade depression levels were noticed among controlled asthmatic cases, however total scores did not differ significantly between them ($p > 0.05$). The highest levels of distress were noticed among uncontrolled asthma patients compared to partially and controlled cases with no statistically significant difference ($p > 0.05$). Similar results were found in recent studies such as [5,8,14,15].

Studies examining comorbidity of asthma and mental disorders suggest that adults with asthma are at increased risk of manifesting major depressive disorder or, anxiety disorders including generalized anxiety disorder, panic disorder, post-traumatic stress disorder and social phobia [16]. The presence of a chronic and potentially life-threatening illness may exert

enough stress that an anxiety or depressive disorder emerges in vulnerable patients. As a consequence, epidemiologic associations between major depressive disorder (MDD) and asthma might be apparent but not reflect a shared pathophysiological vulnerability. Alternatively, there may be aspects of dysregulation in key biologic systems, such as the neuroendocrine stress response or cytokine system, that predispose people to both asthma and psychiatric illnesses independent of the psychological impact of one chronic illness on the other [14]. Alterations in the *Hypothalamic Pituitary Adrenal Axis* (HPA) axis [17], immune system [18] and the autonomic nervous system (ANS) [19] may explain the co-occurrence of these conditions.

There was a negative weak correlation between psychiatric symptoms and age, duration of asthma and forced expiratory volume in the first second ($p > 0.05$).

Conclusion

Distress and psychiatric illnesses, particularly depression, anxiety and somatization occur at higher rates in individuals with asthma than in the general population. More research is required to understand the environmental and genetic factors involved in this association. A relation was noticed between the psychological status of asthmatic patients and asthma control. These coexisting psychiatric disorders often remain undiagnosed without psychiatric assessment. So, they should be diagnosed and treated by Pharmacological and non pharmacological therapies as soon as possible, to improve patients' outcome and achieve the best control of asthma.

Conflict of interest

None declared.

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