

# The Prevalence and Pulmonary Consequences of Anxiety and Depressive Disorders in Patients with Asthma

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## ABSTRACT

*The aim of this study was to determine the prevalence of anxiety and depression symptoms in outpatients with treated asthma and to determine the influence of anxiety and depression symptoms on lung function and asthma symptoms. The study was conducted in the pulmonary clinic of the Department of Pulmonary Diseases, Osijek University Hospital Center, on 200 outpatients with asthma, aged 18–50 years, of which there were 65.5% women and 35.5% men. Each patient underwent a clinical examination with an extensive anamnesis and lung auscultation. The lung function was tested by spirometry. Demographic data and data on general and socioeconomic characteristics were evaluated using a questionnaire created internally for the purposes of this research, psychological status was assessed by HAD questionnaire, and Q test was used as a measure of asthma control. Based on the HAD questionnaire, 44.5% of asthma patients met the criteria for anxiety, and 24.5% of asthma patients met the criteria for depression. There was no significant correlation between asthma symptoms and the degree of anxiety or depression, while the pulmonary function of asthma patients negatively correlated with the degree of anxiety and depression. Pulmonary function in asthma patients with symptoms of anxiety and depression was significantly poorer than in asthma patients without anxiety and/or depression symptoms. The results show that among asthma patients there are large number of those who have symptoms of anxiety and depression. Asthma patients with symptoms of anxiety and depression have poorer lung function than patients with only asthma symptoms, however there is no significant correlation between the lung function and symptoms of asthma. We have confirmed that patients with anxiety symptoms visit general practitioners or EMS significantly more when compared to patients with depression symptoms.*

**Key words:** asthma, anxiety, depression

## Introduction

The prevalence of asthma is increasing worldwide, especially in Western and industrialized countries and it is expected that in the next twenty years the number of patients could increase for another hundred million<sup>1</sup>. In particular, it is rising among children and adolescents<sup>2,3</sup>. Asthma is a very common and complex respiratory disease that occurs as a result of the interaction of genetic, environmental, social and psychological factors. In the pathogenesis of asthma, oxidative stress appears to play an important role and existence of an oxidant/antioxi-

dant imbalance is evident<sup>4</sup>. The asthmatic patients more frequently perceived harmful ecological factors in their environment and regarded them significant for the occurrence of their disease<sup>5,6</sup>. Furthermore, studies show that patients with asthma have an increased risk of developing psychiatric disorders<sup>7,8,10</sup>. The association between asthma and emotional factors has been researched for a long time. Numerous studies suggest that there is a correlation between asthma and specific mental disorders, particularly anxiety and depression, but it is still

not clear whether having asthma is a risk factor for developing anxiety and depression, or if psychiatric disorders increase the risk of developing asthma. Children and adolescents with asthma have twice as high risk of developing one or more anxiety or depressive disorders<sup>11,12</sup>. It is believed that psychological factors, such as personality characteristics may be important, and that they primarily affect the development and clinical expression of asthma. Asthma symptoms are of a great importance for both patients and doctors, because medical decisions are, amongst other, based on the patient's condition and reported symptoms. Patients seem to be satisfied with asthma control that does not correspond to suppression of symptoms, whereas physicians neglect patients' emotional problems and the impact asthma has on everyday life. The differences in the perception of asthma may reflect differences in beliefs about health. Physicians see health as an absence of symptoms, whereas patients regard being healthy as »being able«<sup>13</sup>. Because of the overlap between asthma, anxiety (shortness of breath, rapid heartbeat) and depression symptoms (insomnia, anxiety), they can be misinterpreted which in turn could lead to unrecognized and untreated anxiety and depressive disorders, which affects treatment strategies and causes poorer treatment outcome. There is contradictory data if patients with asthma and comorbid mental disorders have more symptoms of asthma and if coexistent mental disorders have a greater negative effect on lung function and make it worse than the one observed in the patients who suffer only from asthma. If so, this could result in an increased need for health service<sup>14–17</sup>.

## Patients and Methods

Included in the study were 200 outpatients with asthma who came to regular examination. The patients were between ages 18–50, of both genders and from both rural and urban geographies. During the study, all patients were treated with anti-inflammatory, symptomatic medications or their combinations. We excluded patients with respiratory diseases other than asthma and the patients with diseases of other organ systems, such as diabetes, autoimmune diseases, cancer and other serious illnesses.

Each patient was subjected to a detailed anamnesis and subjective symptoms were evaluated. We evaluated daily and nocturnal asthma symptoms like cough, shortness of breath, wheezing, production of mucus and waking up or walking at night. Based on the reported subjective symptoms of asthma and information about taking the recommended therapy, patients were classified into four groups according to intensity, as defined by GINA<sup>1</sup>: intermittent asthma, mild persistent asthma, moderate persistent and severe persistent asthma. After evaluating severity of symptoms, clinical examination with lung auscultation was made. Auscultation of the lungs was used to distinguish three groups of patients according to the severity of symptoms such as: normal breathing, im-

paired breathing, noise and bronchial sounds, whistles and prolonged expiration.

Pulmonary function of asthma patients was measured by spirometry which was repeated three times. The evaluation was based on the best values of 3 acceptable attempts before, and 20 minutes after the application of salbutamol 0.4 mg through inhalation, which is equivalent to the standard test. Evaluated spirometry parameters were: forced vital capacity (FVC), forced expiratory volume in 1<sup>st</sup> second (FEV<sub>1</sub>), ratio of forced expiratory volume and vital capacity x100 (Tiffeneau index) and the peak expiratory flow rate (PEF). Obstructive ventilatory disorder was considered if the results were expressed as the standard value in a relation to the reference according to ECCS/ERS standards<sup>18</sup>.

After examination and spirometry each patient was given four self-assessment instruments.

General socio-demographic and psychosocial data were gathered using a questionnaire about general and psychosocial data, made internally for this study. To estimate the severity of asthma symptoms over a period of seven days before the start of the research, we used a »Q score« questionnaire<sup>19</sup>. It is a short patient focused morbidity index consisting of four questions in relation to the past week: 1. How many times last week did you lose air and feel pressure in your chest? 2. How many nights did you wake up because of asthma? 3. How many times this week has asthma prevented you from normal activity? 4. How many times have you used your inhaler? Each question was measured with scores from 0–2, depending on the rounded 1 of 3 options. The result of the scale was expressed as a sum ranging from 0–8. With the »Q score« a low total score indicates a greater control of asthma symptoms – Q value was divided into scores less than, equal to, or greater than 4 of 4. A score less than or equal to 4, indicates a good control of asthma symptoms, whilst greater than 4 indicate poor control of asthma symptoms. Hospital Anxiety and Depression scale (HAD)<sup>20</sup> was used to measure anxiety and depression symptoms. It consists of 14 claims, of which 7 are related to anxiety and 7 to depression. The value 7 or less on the HAD scale was taken as normal, 8–10 indicated presence of anxiety and depression symptoms, and a value of 11 or more a definitive presence of anxiety and depression symptoms.

To describe numerical figures, we used basic measures of the medium and scattering. A normality of distribution of the observed numerical variables was tested by Kolmogorov-Smirnov's test. Categorical variables were described in absolute and relative frequencies. Kruskal-Wallis's test was used for comparing more than two independent groups. Differences between categorical variables were tested with  $\chi^2$ -test or Fisher's exact test. Internal reliability coefficient of each questionnaire was demonstrated with Cronbach's coefficient. For assessing the importance of the results, the level of the importance of alpha=0.05 was chosen. To compile the results we used the software Statistica for Windows 2005 (version 7.1, StatSoft Inc., Tulsa, OK, USA).

## Results

The testing was conducted on 200 patients, mean age 35.8 years, ranging from 18 to 50 years, 34.5% male and 65.5% female patients. 54% of the patients were from an urban area. Most patients (79.5%) were non-smokers, and 20.5% of patients were current smokers. Considering duration of asthma, patients were divided into three groups (up to 2 years, from 2 to 5 years and 5 years and more) and the majority of patients had been treated for asthma for more than 5 years (44.5%). The majority of the patients, 42.5% of them, had intermittent asthma, 33.5% had mild persistent, 19.5% moderate persistent, and 4.5% had severe persistent asthma (Figure 1). In the last week of testing, there were no asthma symptoms in 45.5% of the patients. The most common symptom, in both men and women, was shortness of breath (30%), and 11.5% of the patients had early morning or persistent dry cough. Other symptoms were present in 24.5% of the patients (Table 1). Considering duration of asthma, the most commonly reported symptoms were shortness of breath and wheezing in all three patient groups. However, it was not proven that the presence of certain symptoms in correlation to duration of asthma was statistically significant ( $p=0.070$ ) (Table 2). Considering

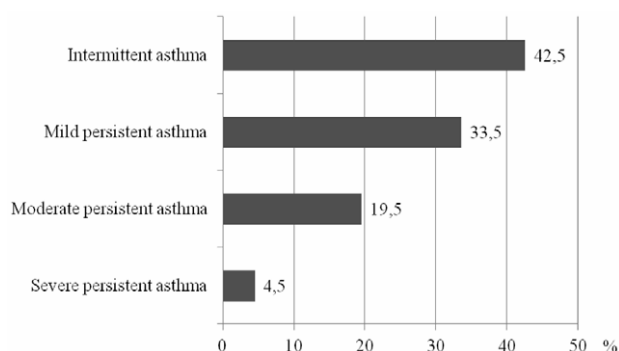


Fig. 1. Distribution of the patients by asthma severity rate based on the symptoms.

auscultatory findings, 75% had normal breathing noise, 11.5% had decreased breathing noise, while 14% of the patients had bronchial noises, whistles and prolonged expiration. Comparison of auscultatory findings with the most common symptoms of asthma in the last week of research, showed that 35.7% of patients with shortness of breath, had also bronchial sounds, whistles and prolonged expiration and 39.3% of patients who did not have

TABLE 1  
THE MOST COMMON SYMPTOMS OF ASTHMA DISTRIBUTED BY GENDER IN THE LAST WEEK

The most common symptoms of asthma	Gender		Total N (%)	p*
	Male N (%)	Female N (%)		
Early morning or persistent cough	11 (15.9)	12 (9.2)	23 (11.5)	0.252
Shortness of breath (wheezing...)	26 (37.7)	34 (26)	60 (30)	
Pressure in the chest	3 (4.3)	9 (6.9)	12 (6)	
Creating sewage which is difficult to release	3 (4.3)	8 (6.1)	11 (5.5)	
Wake-up or walk at night	1 (1.4)	2 (1.5)	3 (1.5)	
No symptoms	25 (36.2)	66 (50.4)	91 (45.5)	
Total	69 (100)	131 (100)	200 (100)	

\* $\chi^2$ -test

TABLE 2  
DISTRIBUTION OF THE PATIENTS CONSIDERING DURATION OF ASTHMA AND MOST COMMON SYMPTOMS

The most common symptoms of asthma	Duration of asthma			Total N (%)	p*
	1–2 years N(%)	2–5 years N(%)	> 5 years N(%)		
Early morning or persistent cough	12 (16.9)	1 (2.5)	10 (11.2)	23 (11.5)	0.070
Shortness of breath (wheezing...)	23 (32.4)	9 (22.5)	28 (31.5)	60 (30)	
Pressure in the chest	4 (5.6)	6 (15)	2 (2.2)	12 (6)	
Creating sewage difficult to release	2 (2.8)	2 (5)	7 (7.9)	11 (5.5)	
Wake-up or walk at night	0	1 (2.5)	2 (2.2)	3 (1.5)	
No symptoms	30 (42.3)	21 (52.5)	40 (44.9)	91 (45.5)	
Total	71 (100)	40 (100)	89 (100)	200 (100)	

\* $\chi^2$ -test

asthma symptoms, had bronchial sounds, whistles and prolonged expiration, too. Among the functional tests on the entire group of patients, spirometry testing was done with special emphasis on the parameters indicating obstructive disorders of ventilation: vital capacity (VC), forced vital capacity (FVC), forced expiratory volume in first second (FEV<sub>1</sub>), Tiffeneau index and the highest expiratory flow (PEF). Disturbance of obstructive ventilation was divided on the basis of the measured FEV<sub>1</sub> to a: lower degree of obstruction (60–80% of baseline), intermediate level (40–59% baseline) and high level (less than 40% of baseline). Most patients had normal spirometry and 17.5% of the patients had obstructive interference, of which 8.5% had lower degree of obstruction, 7.5% obstruction of intermediate level and only 1.5% of patients had high level obstruction. The presence of anxiety and depression symptoms in asthma patients measured by HAD scale proved that anxiety was present in 44.5% of patients, of which 25% had proved anxiety and 19.5% had questionable anxiety. Also it was found that 24.5% of the patients had symptoms of depression, out of which

13% of patients had questionable and 11.5% proved depression (Figure 2). Due to asthma symptoms 37.5% of the patients visited a GP/ERS or demanded hospital services during the last week of testing, out of which 54.5% suffering from anxiety. The difference was statistically significant (p=0.017) in comparison to patients with depression where we did not confirm the relationship between depression and frequency of visiting the GP/ERS or demanding hospital services (p=0.836) (Table 3). The aim of this study was to determine the influence of anxiety and depression symptoms on the type, frequency and intensity of asthma symptoms with the degree of anxiety or depression, which did not prove statistically significant (Table 4 and 5). The research found that with 52% of the patients with anxiety and depression symptoms, there were no asthma symptoms and most commonly reported symptoms were shortness of breath and wheezing, early morning or persistent cough. The difference in the prevalence of individual symptoms of asthma and the level of anxiety and depression did not prove statistically significant (p=0.429 for anxiety and p=0.414 for depression). In patients with asthma and anxiety symptoms, measured values of vital capacity, forced vital capacity and forced expiratory volume in 1<sup>st</sup> second, and PEF were significantly lower (p<0.001 and p=0.007) than in

**TABLE 3**  
VISITING THE DOCTOR OR EMS BECAUSE OF ASTHMA

Asthma	Visiting the doctor or EMS because of asthma			p*
	No N (%)	Yes N (%)	Total N (%)	
<b>Anxiety</b>				
Not present	77 (61.6)	34 (45.3)	111 (55.5)	0.017
Questionable	17 (13.6)	22 (29.3)	39 (19.5)	
Present	31 (24.8)	19 (25.3)	50 (25)	
<b>Depression</b>				
Not present	96 (76.8)	55 (73.3)	151 (75.5)	0.836
Questionable	15 (12)	11 (14.7)	26 (13)	
Present	14 (11.2)	9 (12)	23 (11.5)	
Total	125 (100)	75 (100)	200 (100)	

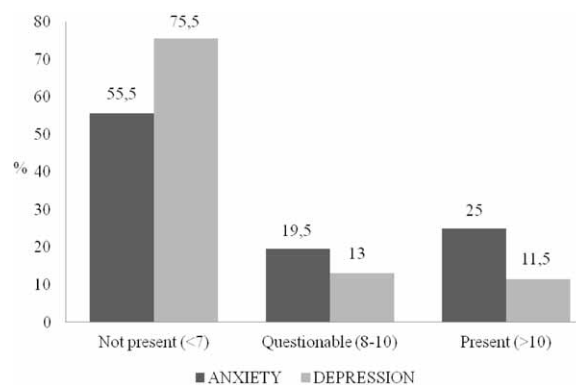


Fig. 2. The distribution of the patients according to the presence of anxiety and depression.

**TABLE 4**  
DISTRIBUTION OF PATIENTS ACCORDING TO SYMPTOMS OF ASTHMA AND LEVEL OF ANXIETY

Symptoms of asthma	Anxiety			Total N (%)	p†
	Not present N (%)	Questionable N (%)	Present N (%)		
Early morning or persistent cough	12 (10.8)	3 (7.7)	8 (16.0)	23 (11.5)	0.429
Shortness of breath (wheezing...)	37 (33.3)	10 (25.6)	13 (26.0)	60 (30)	
Pressure in the chest	9 (8.1)	3 (7.7)	0	12 (6)	
Creating sewage which is difficult to release	7 (6.3)	1 (2.6)	3 (6.0)	11 (5.5)	
Wake-up or walk at night	2 (1.8)	1 (2.6)	0	3 (1.5)	
No symptoms	44 (39.6)	21 (53.8)	26 (52.0)	91 (45.5)	
Total	111 (100)	39 (100)	50 (100)	200 (100)	

\*χ<sup>2</sup>-test

**TABLE 5**  
DISTRIBUTION OF PATIENTS ACCORDING TO SYMPTOMS OF ASTHMA AND LEVEL OF DEPRESSION

Symptoms of asthma	Depression			Total N (%)	p <sup>†</sup>
	Not present N (%)	Questionable N (%)	Present N (%)		
Early morning or persistent cough	14 (9.3)	6 (23.1)	3 (13)	23 (11.5)	0.414
Shortness of breath (wheezing...)	48 (31.8)	6 (23.1)	6 (26.1)	60 (30)	
Pressure in the chest	12 (7.9)	0	0	12 (6)	
Creating sewage which is difficult to release	8 (5.3)	1 (3.8)	2 (8.7)	11 (5.5)	
Wake-up or walk at night	3 (2)	0	0	3 (1.5)	
No symptoms	66 (43.7)	13 (50)	12 (52.2)	91 (45.5)	
Total	151 (100)	26 (100)	23 (100)	200 (100)	

\* $\chi^2$ -test

**TABLE 6**  
RELATION BETWEEN THE PRESENCE OF ANXIETY SYMPTOMS AND SPIROMETRY RESULTS

Spirometry	Anxiety			p <sup>†</sup>
	Not present N=111	Doubtful N=39	Positive N=50	
	Sv (SD)*	Sv (SD)*	Sv (SD)*	
Vital capacity (VC)	109.66 (13.4)	105.43 (15.2)	95.9 (19.7)	<0.001
Forced vital capacity (FVC)	111.27 (13.7)	106.46 (16.6)	96.84 (21.3)	<0.001
Forced expiratory volume in 1 <sup>st</sup> (FEV <sub>1</sub> )	105.24 (18.6)	98.05 (21.3)	88.14 (27.9)	<0.001
TIFF % (FEV <sub>1</sub> /VC)	97.09 (10.9)	94 (12.9)	91.94 (16.3)	0.256
Peak expiratory flow (PEF)	103.22 (44.9)	91.74 (19.4)	87.04 (29.3)	0.007

**TABLE 7**  
BASIC MEASURES OF MEAN AND DISPERSION OF OBSERVED PARAMETERS ACCORDING TO THE LEVEL OF ANXIETY IN BOTH MEN AND WOMEN

Spirometry	Anxiety			p <sup>†</sup>
	Not present N=111	Questionable N=39	Present N=50	
	Sv (SD)*	Sv (SD)*	Sv (SD)*	
<b>MALE</b>				
Vital capacity (VC)	107.57 (15.5)	106.62 (8.9)	98.83 (18.13)	0.193
Forced vital capacity (FVC)	108.80 (16.10)	107.80 (11.73)	100.05 (19.59)	0.221
Forced expiratory volume in 1 <sup>st</sup> second (FEV <sub>1</sub> )	99.17 (21.3)	99.00 (15.15)	89.55 (31.79)	0.313
TIFF % (FEV <sub>1</sub> /VC)	92.85 (12.30)	94.75 (11.15)	88.77 (31.79)	0.529
Peak expiratory flow (PEF)	107.00 (44.8)	95.75 (15.37)	88.83 (34.06)	0.450
<b>FEMALE</b>				
Vital capacity (VC)	110.63 (12.31)	104.61 (18.54)	94.37 (20.74)	<0.001
Forced vital capacity (FVC)	112.40 (12.46)	105.95 (19.57)	95.03 (22.40)	<0.001 t
Forced expiratory volume in 1 <sup>st</sup> second (FEV <sub>1</sub> )	108.03 (16.69)	97.39 (25.10)	87.34 (26.12)	<0.001
TIFF % (FEV <sub>1</sub> /VC)	99.04 (9.79)	93.47 (14.25)	93.72 (16.12)	0.254
Peak expiratory flow (PEF)	101.47 (20.18)	88.95 (21.66)	86.03 (26.92)	0.008

\*Standard deviation; †Kruskal Wallis test

the patients without the symptoms of anxiety (Table 6), and especially in women (Table 7). In addition, we found that patients with anxiety symptoms tended to have higher asthma levels, but the difference was not statistically significant ( $p=0.067$ ). It is evident that all the spirometry parameters were significantly lower ( $p<0.001$  and  $p=0.006$ ) in patients with depression, comparing to patients without depression (Table 8). Due to the fact that all spirometric parameters were significantly lower in each stage of anxiety and depression, the lung function was significantly worse among the patients with anxiety and depression symptoms, unlike among the patients without these symptoms. Based on the results obtained by Q test we did not found a statistically significant difference between the parameters of Q test and the degree of anxiety, while there was a significant difference in the number of patients who were left without air last week ( $p=0.031$ ) (Figure 3) and number of inhaler use for the past week ( $p=0.006$ ) in relation to the degree of depression (Figure 4). Observing the relationship between asthma severity and anxiety, it is evident that differences exist but are not statistically significant. Depression, on the other hand showed a statistically significant difference ( $p=0.011$ ) in all patients (Table 9).

**Discussion**

The association of anxiety and depression with asthma has been confirmed in numerous studies<sup>7-9</sup> as well as that it already occurs in childhood and adolescence<sup>10-12,15,21-24</sup>. Psychiatric disorders were significantly more frequent in asthmatics than in non-asthmatic population<sup>25,26</sup>, and the ratio of various psychiatric disorders, particularly anxiety and depression, according to various researchers varied and range from 9% to 65%<sup>17,27-29</sup>. The results of this study show a high proportion of anxiety and depression symptoms in patients with diagnosed asthma, which is consistent with the results of other studies<sup>16,19,30-37</sup>. The study confirmed that asthma patients with anxiety symptoms visit the doctor or demand emergency care more often because of asthma symptoms, which is associated with greater use of bronchodilators and corticosteroids that significantly increases, both direct and indirect health care costs. According to the

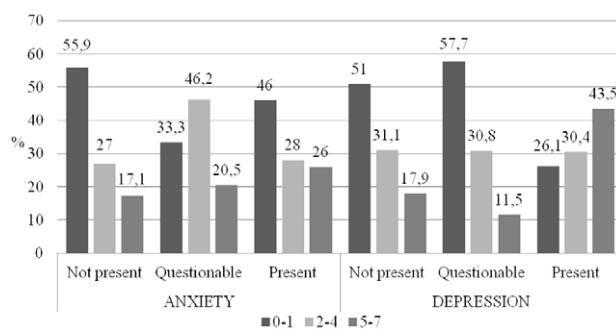


Fig. 3. The difference in the number of patients who left without air according to the q test for anxiety and depression.

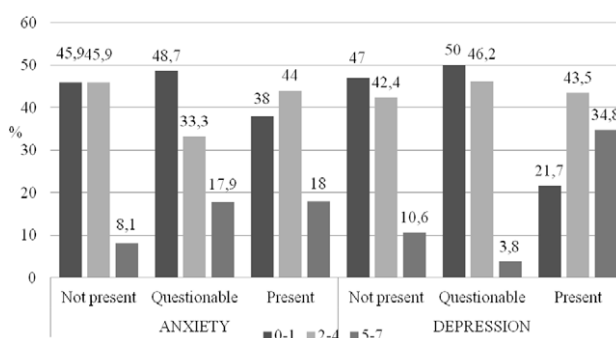


Fig. 4. The difference in the number of patients who left used inhaler according to the q test for anxiety and depression.

research<sup>8,24,33,38,39</sup> there is a strong correlation between respiratory symptoms and indicators of psychological status. It is believed that, due to the partial overlapping of symptoms, asthma patients with psychiatric disorder have significantly more respiratory symptoms. Hyperventilation is known as a common indicator of physical anxiety<sup>40</sup>. However, this research did not confirm a statistically significant difference in the prevalence of individual symptoms and the degree of anxiety and depression. The results showed that the degree of asthma-severity is positively associated with studied mental disorders, particularly in women. The thesis that the more severe

**TABLE 8**  
RELATION BETWEEN THE PRESENCE OF DEPRESSION SYMPTOMS AND SPIROMETRY RESULTS

Spirometry	Depression			p <sup>†</sup>
	Not present N=151	Doubtful N=26	Positive N=23	
	Sv (SD)*	Sv (SD)*	Sv (SD)*	
Vital capacity (VC)	108.4 (13.8)	101.1 (16.9)	90.9 (22.8)	0.001
Forced vital capacity (FVC)	109.8 (14.4)	102.9 (19.4)	90.9 (24.0)	0.001
Forced expiratory volume in 1 <sup>st</sup> (FEV <sub>1</sub> )	103.5 (19.5)	92.2 (27.0)	81.9 (28.5)	<0.001
TIFF % (FEV <sub>1</sub> /VC)	96.5 (11.9)	91.6 (15.2)	90.6 (16.0)	0.103
Peak expiratory flow (PEF)	101.1 (39.9)	84.3 (26.8)	84.4 (30.9)	0.006

**TABLE 9**  
DISTRIBUTION OF PATIENTS REGARDING TO ANXIETY AND DEPRESSION AND ASTHMA SEVERITY ASSESSMENT

Asthma severity score	Anxiety			Total N (%)	p <sup>+</sup>
	Not present N(%)	Questionable N(%)	Present N(%)		
Intermittent asthma	52 (46.8)	16 (41)	17 (34)	85 (42.9)	0.067
Mild persistent asthma	39 (35.1)	12 (30.8)	16 (32)	67 (33.5)	
Moderate persistent asthma	19 (17.1)	9 (23.1)	11 (22)	39 (19.5)	
Severe persistent asthma	1 (0.9)	2 (5.1)	6 (12)	9 (4.5)	
Total	111 (100)	26 (100)	23 (100)	200 (100)	

Asthma severity score	Depression			Total N (%)	p <sup>+</sup>
	Not present N (%)	Questionable N (%)	Present N (%)		
Intermittent asthma	71 (47)	9 (34.6)	5 (21.7)	85 (42.5)	0.011
Mild persistent asthma	50 (33.1)	10 (38.5)	7 (30.4)	67 (33.5)	
Moderate persistent asthma	27 (17.9)	5 (19.5)	7 (30.4)	39 (19.5)	
Severe persistent asthma	3 (2)	2 (7.7)	4 (17.4)	9 (4.5)	
Total	151 (100)	26 (100)	23 (100)	200 (100)	

asthma is associated with mental disorders is also supported by Garden and Ayres<sup>42</sup>. Lung function, measured by spirometry, with all parameters in this study is significantly worse in severe persistent asthma, and shows a significant association with asthma severity score by GINA<sup>1,33,43</sup>, while the duration of asthma was not found as a statistically significant correlate. Conolly and co.<sup>43</sup> show that the highest lung capacity becomes lower at each higher level of treatment, what suggests that these patients may have irreversible damage – changes on lungs were already noticed. We also confirmed that the pulmonary function is significantly worse for patients that have present anxiety and depression (significantly higher for women), than for patients without a psychiatric disorder, which is consistent with some studies<sup>33</sup>, while other studies indicate the opposite and that is a strong relationship between respiratory symptoms and psychological status indicators, but a negative correlation with pulmonary function<sup>8,34,44</sup>. Moy<sup>45</sup> also states that measurements of lung function are not predictors of quality of life, while taking relievers and intensity of symptoms as dyspnea, wheezing and coughing are significant predictors of quality of life. The goal of asthma treatment is to achieve and maintain good disease control with minimal side effects associated with therapy. However, numerous studies have shown that despite available effective drugs, control of the disease can be achieved only in some patients<sup>46</sup>. One possible reason for poor disease control and poor patient compliance and failure to comply with the recommended therapy is often caused by the accompanying anxiety or depression and therefore we should act on the early recognition of anxiety and depression symptoms and thus that the questionnaires on asthma control should include the questions about possible mental disorders. Consequently to that,

the appearance and intensity of asthma symptoms will be lower, pulmonary function in patients with asthma will be the better what will contribute to better asthma control and improvement of their quality of life.

## Conclusion

In patients with asthma, there are a significant number of patients with anxiety and depression symptoms. Patients with anxiety and depression symptoms have a more severe level of asthma. However, we did not confirm statistically significant difference between asthma symptoms and the degree of anxiety and depression. Visits to the GP or ERS because of asthma symptoms were significantly more frequent in patients with anxiety symptoms. All spirometric parameters showed that the pulmonary function is worse in patients with anxiety and depression. Patients with anxiety and depression have poorer disease control measured by Q test, than patients with asthma without these disorders, but the results were not statistically significant. The prevalence of patients with anxiety and depression symptoms in asthma is significant and has a negative impact on symptoms and lung function in asthma patients, resulting in poorer disease control and increased use of health care. Therefore, it is crucial that physicians in the evaluation of the disease control and the evaluation of treatment strategies take into account the impact of negative moods and reduce undeniable negative impact on the quality of life of asthma patients. It is necessary that questionnaires about asthma include questions about possible psychological problems, as they may be one of the most promising strategies, not only to improve suppression of asthma, but health in general. Certainly we know that the quality of life of all asthmatics, especially the ones with

comorbid anxiety or depression, is significantly reduced because they are less tolerant to physical exertion and mental stress<sup>47</sup>. It is not yet known how the treatment of

anxiety and depression symptoms can affect asthma control and quality of life for these patients and further longitudinal studies are required.

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## **PREVALENCIJA ANKSIOZNIH I DEPRESIVNIH POREMEĆAJA U BOLESNIKA S ASTMOM I UTJECAJ NA SIMPTOME I PLUĆNU FUNKCIJU U BOLESNIKA S ASTMOM**

### **S A Ž E T A K**

Cilj ove studije je utvrditi učestalost simptoma anksioznosti i depresije u bolesnika s astmom koji su ambulantno liječeni te utvrditi utjecaj simptoma anksioznosti i depresije na plućnu funkciju i simptome astme. Studija je provedena u pulmološkoj ambulanti Odjela za plućne bolesti KBC Osijek na 200 ambulantno liječenih bolesnika s astmom u dobi od 18–50 godina, od toga je bilo 65,5 % žena i 45,5% muškaraca. Svakom bolesniku učinjen je klinički pregled s opsežnom anamnezom i auskultacijom pluća. Funkcija pluća ispitana je metodom spirometrije. Demografski podaci i podaci o općim i socioekonomskim obilježjima ispitani su koristeći interno napravljen upitnik za potrebe ovog istraživanja, a psihološki status je ocijenjen HAD upitnikom, te je kao mjera kontrole astme korišten Q test. Na osnovu HAD upitnika 44,5% bolesnika s astmom ima kriterije za anksioznost, a 24,5% bolesnika ima kriterije za depresiju. Nije dokazana značajna povezanost simptoma astme sa stupnjem anksioznosti ili depresije, dok je plućna funkcija bolesnika s astmom negativno povezana sa stupnjem anksioznosti i depresije, odnosno plućna funkcija bolesnika s astmom i simptomima anksioznosti i depresije je značajno lošija nego u bolesnika s astmom, a bez simptoma anksioznosti i /ili depresije. Rezultati pokazuju da u bolesnika s astmom postoji velik udio bolesnika koji imaju i simptome anksioznosti i depresije. Bolesnici s astmom i simptomima anksioznosti i depresije imaju lošiju plućnu funkciju nego bolesnici sa samo simptomima astme, dok značajna povezanost s pojavom pojedinih simptoma astme nije potvrđena. Potvrdili smo da bolesnici sa simptomima anksioznosti značajno češće posjećuju liječnika opće prakse ili HMP u odnosu na bolesnike sa simptomima depresije.