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Evaluation of the relationship between some mental state parameters and the quality of life in patients with allergic diseases

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Summary

Aim. The aim of the study was to assess the relationship between symptoms of depression, the level of sense of coherence (SOC) and the quality of life in patients with allergic diseases.

Material. The study involved 50 bronchial asthma patients, 72 patients with seasonal allergic rhinitis, and 48 patients with atopic dermatitis. The control group consisted of 50 healthy volunteers.

Methods. The mental status and quality of life were assessed by questionnaires: Short Form-36 Health Status Survey (SF-36), Beck Depression Inventory (BDI), Sense of Coherence-29 (SOC-29.

Results. Mean depression severity values were higher in allergic rhinitis patients and atopic dermatitis patients than in the control group. Patients in the latter group also showed higher rates of depression than those with bronchial asthma. In all study groups, statistically significantly lower values of sense of coherence were demonstrated compared to healthy subjects. There were no differences in the values of sense of coherence, in comparisons between the study groups. In all patient groups, lower values in physical functioning (PCS) of the quality of life scale were observed compared to the control group. The severity of symptoms of depression in all groups showed negative correlations with quality of life parameters and a sense of coherence. In addition, the SOC value correlated negatively with the parameters of mental functioning (MCS) of the quality of life scale.

Conclusions. (1) Patients with atopic dermatitis showed the greatest severity of depressive symptoms. (2) Patients with seasonal allergic rhinitis showed a better quality of life than patients with chronic bronchial asthma and patients with atopic dermatitis. (3) Low level of sense of coherence in patients suffering from allergic diseases and the occurrence of symptoms of depression can worsen the quality of life.

Key words: depression, sense of coherence, quality of life, allergic diseases

Introduction

The interaction of mental and somatic factors in the development and course of disease is an undeniable fact. Depression accompanies many somatic diseases, and its appearance can be influenced by numerous factors: physical suffering, lack of support from family, attitude of the environment, changes in appearance, lack of knowledge about the disease, change in life situation, uncertainty of further events, as well as the method of treatment (side effects of drugs). The problem of the association of depression with hormonal or immunological disorders as well as with atopic allergic diseases is also often raised [1-4]. Atopic diseases include asthma, allergic rhinitis and atopic dermatitis, which can be characterized by a chronic course and lead to impairment of the function of the affected organ. In addition, according to studies, people affected by allergic diseases are at risk of developing mental disorders [5]. The occurrence of psychopathological symptoms such as anxiety, depression or sleep disorders, which are often a complication of the disease itself, adversely affects their course and, as a consequence, can lead to a deterioration in the quality of life [6-8]. Depressive symptoms may also be accompanied by a reluctance to take any action, including following medical advice. Chronic disease is always a source of stress, and coping with it is carried out using different strategies. The way of coping with a difficult situation can be associated with the personality traits of the patient, his ability to overcome adversities and come to an agreement with their existence, and it may also depend on a personality variable such as a sense of coherence. Sense of coherence (SOC) is a property that characterizes the mechanisms of the fight against stress. It is defined as a way of looking at the world that allows for the perception and recognition of surrounding phenomena in an intelligible, controlled and meaningful manner [9, 10]. Treating the disease as a state of chronic stress, people with a strong sense of coherence are more likely to behave adaptively, lead a healthy and hygienic lifestyle, pay attention to the symptoms of the disease and follow doctors' recommendations. Part of the concept of sense of coherence is the assumption that it can be significantly lower in people with somatic and mental disorders and that it can be regarded as a variable important in coping with the disease [11].

The aim of the study was to assess the relationship between symptoms of depression, the level of sense of coherence and the quality of life in patients with allergic diseases.

Material

The study group comprised 170 patients, divided into the following subgroups:

(1) A group of 50 patients with chronic bronchial asthma (AO) (24 women and 26 men aged 18-45 years, average age – 30.0 years). The average disease duration was estimated to be 14.9±8.83 years. Patients during the study period remained in the phase of controlling the symptoms of the disease. Asthma symptoms were controlled with inhaled glucocorticoids and inhaled beta$_2$ prolonged-action mimetics.

(2) A group of 72 patients with seasonal allergic rhinitis (SANN) (37 women and 35 men aged 18-45 years, average age – 28.5 years). The average disease duration was estimated to be 12.3±4.31 years. The study was conducted during the period of natural allergen exposure. Patients remained in a stable phase of the disease, the symptoms of which were controlled with oral antihistamines.
(3) A group of 48 patients with atopic dermatitis (AZS) (22 women and 26 men aged 18-47 years, average age – 31.0 years). The average disease duration was estimated to be 11.2±8.77 years. Symptoms of the disease were controlled with oral antihistamines and antipruritic drugs used externally.

The study did not include patients who:

– did not consent to the study,
– confirmed the use of steroids systematically during the three months preceding the study,
– were suffering from other chronic diseases (including mental disorders).

All patients were treated at the Allergy Outpatient Clinic in Zabrze.

The control group (K) included 50 healthy volunteers (26 women and 24 men aged 18-51 years, average age – 28.8 years), appropriately selected by gender and age, showing no signs of allergy and with no chronic diseases.

The study was approved by the Ethics Committee of the Medical University of Silesia in Katowice.

Methods

The following self-assessment questionnaires were used in the evaluation of the parameters:

(1) Beck Depression Inventory (BDI);
(2) Sense of Coherence Questionnaire (SOC-29);
(3) Short Form-36 Quality of Life Scale (SF-36).

Beck Depression Inventory (BDI) was used to assess depression levels. It is a self-assessment tool that allows to identify the symptoms of depression and reflect its severity. The answer scoring range for each question is the same, ranging from 0 to 3 points, with more points indicating a greater severity of the changes assessed [12].

In assessing the sense of coherence the Polish adaptation of Aaron Antonovsky's Life Orientation Questionnaire SOC-29 *(Sense of Coherence 29)* was used. The questionnaire consists of 29 questions and allows to estimate on a point scale the overall level of coherence (TOT-SOC) and the level of three dimensions that it consists of: sense of comprehensibility – PZR (eleven questions), sense of manageability – PZ (ten questions), sense of meaningfulness – PS (eight questions). The sum of the scores of all three subscales reflects the overall sense of coherence. Obtaining a high score indicates strong sense of coherence [8]. The scale was not standardized, so it is not possible to refer to numerical standards, but numerous studies show that reaching

around 140-160 points means a strong sense of coherence, 110-130 – average, and below 100 points – a low sense of coherence [11].

J.E. Ware's 36-point *Short Form-36 Health Status Survey (SF-36)* was used to assess quality of life in the Polish version, with the prior written consent of the author. It is a generic scale that allows to assess the quality of life in the course of various diseases. This scale includes 36 questions on eight spheres of life: general health (GH), physical functioning (PF), physical limitations in role-playing (RP), emotional limitations in role-playing (RE), social functioning (SF), physical pain (BP), vitality (VT), mental health (MH), and two subscales that comprehensively capture physical functioning (PCS – Physical Component Summary Scale) and mental functioning (MCS – Mental Component Summary Scale). After using the corresponding conversion formula, a score of 0-100 points is obtained in each domain. A higher score indicates a better quality of life [13, 14]. The SF-36 scale is not standardized in Polish conditions (there are standards for the American population and the population of some Western European countries).

Statistical analysis of data

For comparison of different groups of patients, the Kruskal-Wallis and Mann-Whitney U test were used. The SOC parameters, depression and their relation to quality of life were analyzed with Spearman's rank-order correlation test. *P*-values below 0.05 were considered to be statistically significant. Statistical analysis was performed with Statistica 12.0 PL (Statsoft Inc., USA).

Results

The study groups did not differ statistically in terms of age, gender and duration of disease.

Symptoms of depression

In the group of patients with seasonal allergic rhinitis (SANN) and atopic dermatitis (AZS), compared to the healthy group (K), statistically significantly higher levels of depression assessed by the BDI were noted. The values for depression severity were also significantly statistically higher in the atopic dermatitis (AZS) group compared to the bronchial asthma (AO) group. In the latter group, the severity of depression symptoms was lowest among all examined groups of patients (Figure 1).

Parameters of sense of coherence

Patients in all study groups showed a lower level of total sense of coherence (TOT-SOC) compared to healthy subjects (K). When comparing the study groups, no statistically significant differences were observed in the values of the sense of coherence (Figure 2).

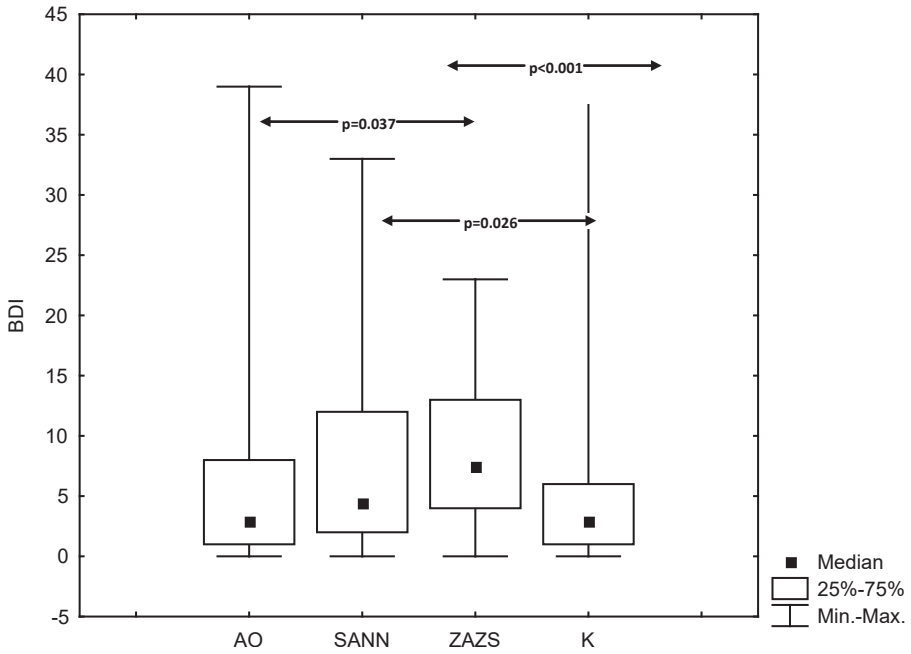

Figure 1. **Depression levels (BDI) in the study and control groups**

AO – bronchial asthma; SANN – seasonal allergic rhinitis; ZAZS – atopic eczema/dermatitis syndrome; K – control group; statistically significant differences $p < 0.05$; Mann-Whitney U test

Assessment of quality of life in study groups

In order to simplify data analysis, the PSC and MCS summary scales were taken into account in the quality of life assessment. In all of the studied groups – the bronchial asthma (AO) group, seasonal allergic rhinitis (SANN) group, and atopic dermatitis (AZS) group – compared to the healthy (K) group, there were statistically significantly lower values on the physical component summary scale (PCS) (Figure 3). Comparing the individual patient groups, significantly statistically lower values of the PCS scale were observed in the bronchial asthma group (AO) and in the atopic dermatitis (AZS) group than in the seasonal allergic rhinitis (SANN) group (Figure 3). When analyzing the values achieved by the subjects on the mental functioning summary scale (MCS), no statistically significant differences were shown for both the control group and the compared test groups (Figure 4).

Relationship between test parameters

In all study groups, statistically significant negative correlations were noted between the MCS and PCS values of the SF-36 questionnaire and the severity of symptoms of depression. In addition, statistically significant positive correlations were observed in

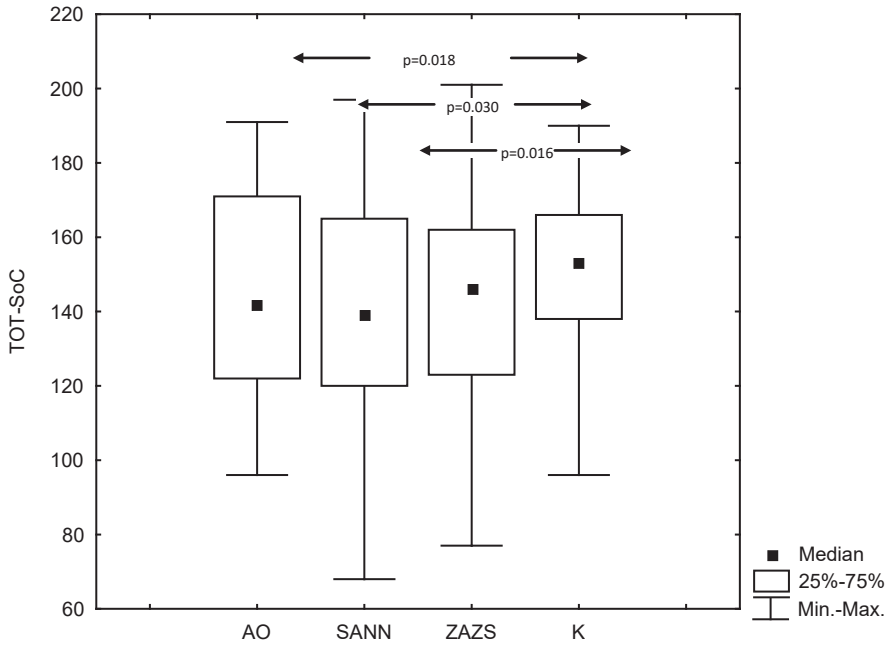

Figure 2. **Total sense of coherence (TOT-SOC) values in the study and control groups**

AO – bronchial asthma; SANN – seasonal allergic rhinitis; ZAZS – atopic eczema syndrome/dermatitis; K – control group; statistically significant differences $p < 0.05$; Mann-Whitney U test

all study groups between the MCS scale of the SF-36 questionnaire and the values of the sense of coherence parameters. The values of the PCS scale did not statistically correlate with the parameters of the sense of coherence. In addition, statistically significant negative correlations between the values of sense of coherence parameters and the severity of symptoms of depression were observed in all study groups (Tables 1-3).

Table 1. **R-values of Spearman's rank correlation in bronchial asthma (AO) patients in the case of dependencies, for which statistical significance was found ($p < 0.05$, Spearman's rank correlation)**

	PCS	MCS	TOT-SOC
BDI	-0.38	-0.55	-0.69
TOT-SOC	n.s.	0.65	-

PCS – Physical Component Summary Scale; MCS – Mental Component Summary Scale; TOT-SOC – total level of sense of coherence; BDI – severity of depression

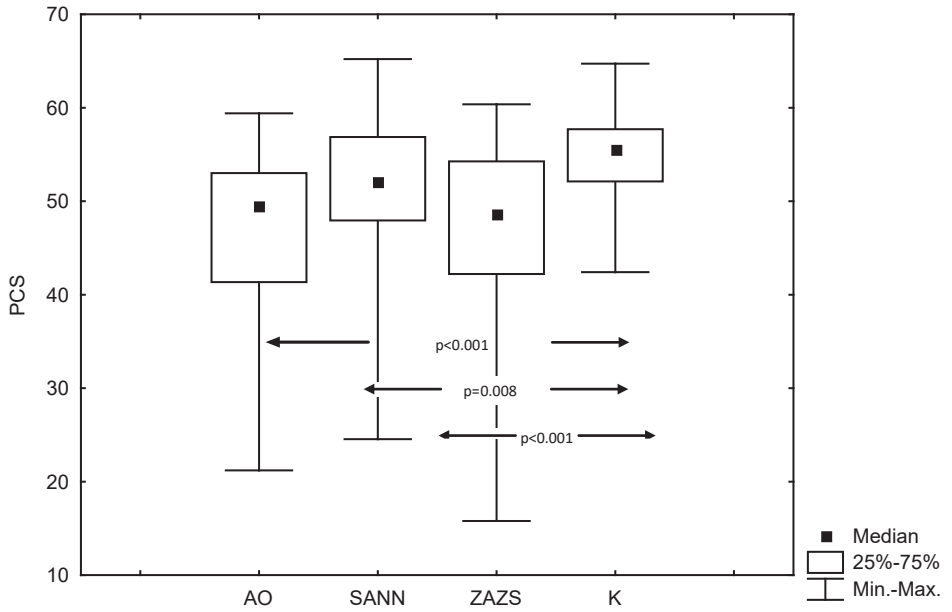

Figure 3. **PCS scale (physical functioning) values in the study and control groups**

AO – bronchial asthma; SANN – seasonal allergic rhinitis; ZAZS – atopic eczema syndrome/dermatitis; K – control group; statistically significant differences $p < 0.05$; Mann-Whitney U test

Table 2. **R-values of Spearman's rank correlation in seasonal allergic rhinitis (SANN) patients in the case of dependencies, for which statistical significance was found ($p < 0.05$, Spearman's rank correlation)**

	PCS	MCS	TOT-SOC
BDI	-0.36	-0.80	-0.82
TOT-SOC	n.s.	0.74	-

PCS – Physical Component Summary Scale; MCS – Mental Component Summary Scale; TOT-SOC – total level of sense of coherence; BDI – severity of depression

Table 3. **R-values of Spearman's rank correlation in atopic dermatitis (AZS) patients in the case of dependencies, for which statistical significance was found ($p < 0.05$, Spearman's rank correlation)**

	PCS	MCS	TOT-SOC
BDI	-0.36	-0.76	-0.70
TOT-SOC	n.s.	0.66	-

PCS – Physical Component Summary Scale; MCS – Mental Component Summary Scale; TOT-SOC – total level of sense of coherence; BDI – severity of depression

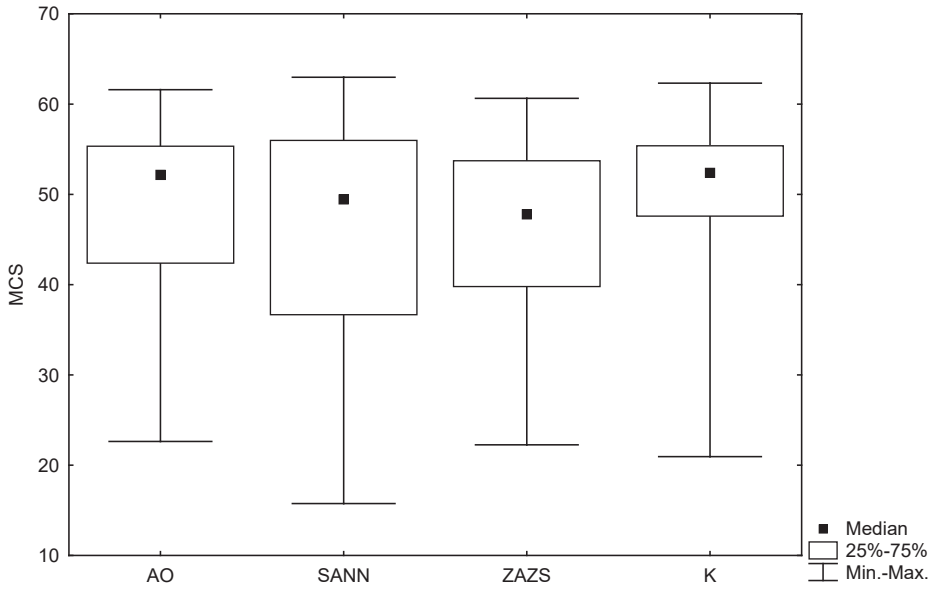

Figure 4. **MCS scale (mental functioning) values in the study and control groups**

AO – bronchial asthma; SANN – seasonal allergic rhinitis; ZAZS – atopic eczema/dermatitis syndrome; K – control group; statistically significant differences $p < 0.05$; Mann-Whitney U test

Discussion

Emotional disorders accompany many somatic diseases, especially those with a chronic course, and such include allergic diseases. In the study, comparing the occurrence of symptoms of depression between groups of patients suffering from various allergic diseases, there was a higher severity of depression in the group of patients with atopic dermatitis compared to both the control group of healthy people and the group of asthma patients. This difference may be due, on the one hand, to a greater "chronicity" of symptoms in atopic dermatitis than in asthma, which, despite the presence of both diseases during the symptom control phase, may cause a greater impact of the exacerbations on the mental state of patients with atopic dermatitis. At the same time, the feeling of "relief" in asthma patients during the stabilization period of the course of the disease may result in a greater reduction in depressive symptoms, as would be indicated by the tendency to the least worsening of depression in this group of patients, compared to others. On the other hand, the possibility of a worse mental state being able to influence the clinical picture of skin lesions in the course of atopic dermatitis also seems important [15]. Both changes in mental state and the chronic course of the underlying disease alone can have a significant impact on quality of life.

As demonstrated in this analysis, in all study groups the prevalence of symptoms of depression correlated with a decrease in the quality of life in both physical (PCS)

and mental (MCS) functioning domains. These results coincide with data obtained in other studies [16-18]. In the study by Jones et al. [19], depression symptoms assessed on the Hospital Anxiety and Depression Scale (HADS) in bronchial asthma patients showed a higher degree of correlation with quality of life parameters than with lung function parameters. Negative correlations were also observed in patients with atopic dermatitis between the severity of the disease and the symptoms of depression and the quality of life parameters [20]. The association of the symptoms of depression with allergic diseases is multifactorial. In addition to affecting quality of life, these disorders can hinder the treatment process by contributing to difficulties in the doctor-patient relationship, overuse of medications in the presence of accompanying anxiety symptoms, or underestimating the need to use them as a result of a depressive assessment of reality [21, 22].

It is also worth noting that the symptoms of depression can have a significant impact on the effectiveness of drugs used in allergic diseases [23, 24]. Diseases evoke feelings of threat, vulnerability, uncertainty, undermine life goals and adversely change the self-image of a person [25]. Effective struggle with stress, illness, and disability depends on many factors, including the choice of adequate remedial action, which may be related to a sense of coherence [26, 27]. In this study, overall sense of coherence values were lower in all patient groups than in healthy subjects. At the same time, no differences were observed between the study groups. Can the fact of a chronic illness be one of the cause factors in reducing the sense of coherence? Most of the subjects struggled with allergic disease for many years, which was also in the period when parameters of the sense of coherence were being shaped. Some kind of "vicious circle" is created: a chronic disease leads to developing lower sense of coherence, which in turn impairs the patient's ability to cope with the disease. It should be noted that regardless of the type of allergic disease, the degree of decrease in the parameters of the sense of coherence was similar. It can be concluded that the kind of symptoms, the extent to which they endanger the health of a person and cause disturbances are less relevant. The sense of being less capable physically, having some "defect" while suffering from a chronic disease is very important for developing the sense of coherence.

The presented results are only the outcome of a certain range of values. The effect of the disease on the parameters of the sense of coherence is different in different patients. What is important, however, is the extent to which this effect through a sense of coherence will shape the parameters that characterize the disease, how it will affect possible additional symptoms and its consequences. Since most allergic diseases begin in childhood, the parameters of a sense of coherence can be considered in this group of patients not only as elements responsible for the ways of coping with the disease, but also as elements that are shaped by it. In this analysis, a lower severity of depression was observed at higher quality of life values in patients with high levels of sense of coherence. Thus, people who have developed a lower sense of coherence may probably more often experience a lower quality of life and may also experience more frequent emotional disorders [28-31].

Conclusions

1. Patients with atopic dermatitis showed the greatest severity of depressive symptoms.
2. Patients with seasonal allergic rhinitis presented a better quality of life than patients with chronic bronchial asthma and patients with atopic dermatitis.
3. In all study groups, low level of sense of coherence and the symptoms of depression coexisted with a lower quality of life.

Limitation of the study

The effects of both anti-allergic drugs and inhaled steroids on the occurrence of depressive symptoms and the assessment of quality of life are not taken into account in the study.

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