



Pollen-sensitive individuals have specific psychological profiles

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Abstract It was shown that allergic diseases can have a psychosomatic component, and it may be important to consider it in the allergy treatment. So the aim of the study was to determine the presence of a leading psycho-type in a group of subjects with a confirmed diagnosis of seasonal allergy in order to improve both medical care and information delivery to patients. The study was carried out among adult men and women using the MMPI (The Minnesota Multiphasic Personality Inventory) methodology. It involved 86 volunteers. Twenty-five of them constituted the control group of 13 women and 12 men, who previously had never been diagnosed with seasonal allergy. The remaining 61 patients were 30 women and 31 men who had been earlier clinically diagnosed

with pollen sensitivity. It was shown that in men with a clinically diagnosed pollinosis, a leading psycho-type of rigidity, paranoia and schizophrenia is determined. A similar effect is observed in pollen-sensitive women who are characterized by the formation of a complex psycho-type with increased indices on scales of depression (D), hysteria (Hy), psychopathy (Pd), paranoia (Pa), psychasthenia (Pt) and hypomania (Ma). The results of the study suggest that the main approach to treatment of patients with seasonal allergies should consider a combination of two treatments regimens—drug therapy and psychotherapeutic support of patients both during the exacerbation of the disease and at the stage of remission.

Keywords Seasonal allergy · Psychological profiles · MMPI · Scales of paranoia · Depression · Psychasthenia

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1 Introduction

Allergic diseases are considered to be psychosomatic complaints due to the fact that nervous and immune systems, as it has been seen in recent years, regulate each other (Montoro et al. 2009). For example, it is proved that central cognitive processes may influence asthma symptoms and the manifestation of measurable changes in immune and physiologic markers of asthma, which shares several risk factors with

depressive disorder and has similar patterns with depression in terms of dysregulation in key biological systems, including the neuroendocrine stress response, cytokines and neuropeptides (Van Lieshout and MacQueen 2008). The same might be true with for seasonal allergy that, in addition to its physiological effect, may have psychological consequences in terms of stress, anxiety or depression. This might be explained by the fact that the seasonality of allergies to pollen and fungal spores can provoke in sensitive individuals the obsession about the upcoming season. Despite the fact that the earliest available sources showing scientists' interest in the problem of interrelationship between psychology of patients and their allergy date back to 1962—and they contain references to even earlier works (Feingold et al. 1962)—there have been few studies of relation between the seasonal allergy and psychological factors (Mehrinedjad et al. 2013). This is in contrast with the amount of research on psychology of patients with food and skin allergies (Conner et al. 2018; Lee et al. 2018; Thyssen et al. 2018). However, a number of studies suggest that the occurrence of the allergic symptoms can in turn be associated with a certain psycho-type of the patient, which commonly develops in childhood (Cheng et al. 2015; Wang et al. 2016).

Finally, yet importantly, pollen forecast, active dissemination of information about plant species producing allergenic pollen, etc. can be a source of iatrogenesis—an effect that does not support a goal to protect the person affected. Furthermore, pollen and information about other types of allergies that patients have to cope with can increase their anxiety and lead to worsening of allergy symptoms or other unpredictable effects (Knibb and Semper 2013).

Therefore, the purpose of the study was to determine the presence of a leading psycho-type in a group of subjects with a confirmed diagnosis of seasonal allergy in order to improve both medical care and information delivery to patients.

2 Materials and methods

The study was carried out among adult men and women using the MMPI (The Minnesota Multiphasic Personality Inventory) methodology. This is a questionnaire consisting of 72 questions in Russian, which was adapted under the supervision of the International

Psychology Associations to standardize the MMPI procedure for the Russian-speaking patients. The names of the scales are not equivalent to a psychiatric diagnosis, and the literal interpretation of scales in the questionnaire should be avoided. If the tested individual has a high score on a certain scale, it indicates that he has a tendency to emotional or behavioral reactions of a certain type of personality. For example, it cannot be assumed that a high score on the “schizophrenia” scale (Sc) indicates the presence of such a disease. The test authors emphasize that it is not the mental disorders themselves that are measured with the help of the MMPI, but only the symptoms inherent in people with certain disorders. Mobility of mental processes in the emotional and volitional areas is characteristic for people having elevated scores on paranoia scale (Pa). High values on this scale can reflect the signs of psychological maladjustment that are reflected by the accumulation of negative emotions by the affected individual, his or her inability to find solutions of problems, and, as a result, by the tendency to somatization in order to obtain secondary benefits. People who have high scores on Sc scale are characterized by isolation, difficulties in social contacts, by stiffness of poses and gestures, by lack of understanding of thoughts and feelings of others. Paranoia and schizophrenia seen in the same profile indicate a tendency to dystrophy, irritability, rigid thinking, vindictiveness and aggressive tendencies. The items on hypochondriasis scale (Hs) concern physical symptoms and well-being. People of this psycho-type are characterized by hypersensitivity and concentration on their somatic condition. Such people are prone to constant revision of their body. In severe cases, this tendency can lead to disadaptation with astheno-neurotic manifestations. The elevated scores on depression scale (D) reflect the high level of pessimism among the respondents of this group, their dissatisfaction with themselves and with life circumstances. Combination of high scores on Hs and D scales are often seen in the elderly and sick men. The high score of patients on psychasthenia scale (Pt) confirm our hypothesis of a predisposition to somatization in individuals with a high level of anxiety. Persons of this type are characterized by self-doubt and indecision; they react with guilt and self-flagellation to the slightest failures and mistakes. They seek to avoid conflict at all costs. Combination of high Hs, D, Pt and Sc scores in sensitized men can indicate their

negative emotions, anxious type of character and are often characteristic for hypochondriacal schizophrenia. Combination of D and hysteria (Hy) can signal emotional immaturity in women, their inability to deal with family life and low performance, general tension, anxiety and weakness. A high level of Hy at the same time can demonstrate agitation. Combination of the high scores on the above-mentioned scales with high scores on Pa scale can be seen in the early stage of psychosis. High D and Pt scores are accompanied by tension, nervousness, increased fatigue, anxiety, obsessive fears and insomnia. A person feels his or her inferiority, has painful sensations. Hy combined with D in the profile points to abundance of somatic complaints, anxiety and at menopause can lead to frequent hysterical seizures, insomnia, complaints of general fatigue and weakness. Combination of Hy and hypomania (Ma) can mean dramatic outbursts of emotions in pollen-sensitive women. High psychopathic (Pd) and Pa scores are an indicator of allergic disorders, hypertension, poor social adaptability, difficulty in contact with another gender combined with irritability, suspicion, isolation, defective judgments. Combined elevated indices of Pd and Pt can mean a tendency to self-flagellation, cycloid mood swings, periodic actions with low control (Sobchik 2001). Testing involved 86 volunteers. Twenty-five of them constituted a control group of 13 women and 12 men who previously had never been diagnosed with the seasonal allergy. The remaining 61 patients were 30 women and 31 men who had been earlier clinically diagnosed with pollen sensitivity.

Symptoms in all the patients were intermittent and were observed during the pollen season only. In several cases of polysensitization (household mite and food intolerance), symptoms were persistent. In 70% of cases, light allergic rhinitis was observed, in 30% of cases it was of moderate severity.

The patients had been experiencing symptoms, on average, for 2–5 years. Allergic rhinitis in combination with asthma was observed in 10% of the volunteers, and the rest had isolated rhinitis. Antigen-specific immunotherapy was taken by 30% of individuals, 70% of them were occasionally treated with antihistamines and topical steroids with no immunotherapy.

Quality of life of the volunteers deteriorated since the onset of clinical symptoms. In those 40% of the patients who took a second or third course of

immunotherapy there was a motivation to continue since, in the summer period, they observed an alleviation of clinical symptoms after the first year of allergen administration.

No psychological problems were observed in the history of most patients. But one of these patients had a psycho-emotional disorder. Another patient was nervous while she had no effect of SIT.

Patients with prevalent nasal congestion during the pollen season were characterized by higher irritability and sleep disturbances in comparison with patients who had mostly sneezing, rhinorrhea or conjunctival symptoms.

Questionnaires were usually filled in during the exacerbation of the symptoms of the disease.

Tests were administered when the patients visited their doctors. The MMPI data were processed by the staff of the Department of Medical Psychology and Psychiatry of National Pirogov Memorial Medical University, Vinnytsia. After processing, the data were analyzed using the Excel.

3 Results and discussion

Average points for all codes in the control group were within the normal range.

The individuals diagnosed with seasonal allergy were mostly city dwellers (63% of females and 71% of males). Most of the volunteers—80% of males and 83% of females—worked indoors, so they were not overly exposed to the atmospheric air.

Approximately half of the patients—54% of men and 50% of women diagnosed with seasonal allergy had elevated scores (60 and more) on at least one tested scale. Four of the pollen-sensitive women had increased indices on 5–7 scales at once, while among the men there were just two such patients.

Nearly one-third or 32% of pollen-sensitive men involved in the study had two leading psycho-types with elevated scores on the sixth (scale of Pa) and on the eighth scale (Sc). High scores on the first scale (Hs), second (D) and seventh (Pt) scales were seen in 23% of the pollen-sensitive men (Table 1).

In the group of women, 23% of the pollen-sensitive volunteers demonstrated an increase in the normative indices on the D scale. Twenty percent of female volunteers had elevated scores on Hy, Pd, Pa, Ma and Pt scales (Table 1).

Table 1 Standardized profiles by MMPI test of pollen-sensitive individuals

Scale	Males			Females		
	<i>T</i> scores, % of total			<i>T</i> scores, % of total		
	< 40	40–59	≥ 60	< 40	40–59	≥ 60
Hs	6.0	71.0	23.0	10.0	73.0	17.0
D	22.5	55.0	22.5	17.0	60.0	23.0
Hy	22.5	68.0	9.5	20.0	60.0	20.0
Pd	16.5	77.0	6.5	27.0	53.0	20.0
Pa	23.0	45.0	32.0	17.0	63.0	20.0
Pt	16.0	61.0	23.0	43.0	37.0	20.0
Sc	10.0	58.0	32.0	30.0	53.0	17.0
Ma	10.0	74.0	16.0	7.0	73.0	20.0

It is not easy to interpret the results of studies of psychological intervention in patients with allergy due to the heterogeneity of patient samples and outcome measures (Van Lieshout and MacQueen 2008). However, it is known that allergic rhinitis can adversely affect every aspect of a patient's life, including sleep quality, mood and daily activities (Kalmarzi et al. 2017). This may affect psychological condition of the patients, which supports our hypothesis about specific life and information perception by the people suffering from pollen allergy.

This idea is supported by Lv et al. (2010), who showed that women with moderate-to-severe persistent allergic rhinitis show poorer psychological functioning, indicating the close relationship between moderate-to-severe persistent allergic rhinitis and psychological functioning. Some authors found elevated MMPI indices on Hs, D, Hy, Pt and Sc scales in women with moderate-to-severe persistent allergic rhinitis, which closely correspond with the current findings. Another study suggests that symptoms of treatment-resistant allergic rhinitis were diminished by the use of antidepressants since the psychosomatic factor is of great importance in patients with this complaint (Uça et al. 2017).

The study performed in the USA concluded that more and better information about the patients' condition and approaches available to improve their quality of life is needed (Meltzer et al. 2017). So, specific changes in psychological profiles of pollen-

sensitive individuals should also be considered during the dissemination of pollen information.

Further research is needed in order to have a more detailed understanding of the change in the psychological profiles of patients with seasonal allergy.

4 Conclusions

Thus, it was shown that in men who are clinically diagnosed with pollinosis, a leading psycho-type of rigidity, paranoia and schizophrenia is determined. It is characterized by accumulation of negative emotions, inability to find ways to solve problems, tendency to dystrophy, irritability, rigid thinking, vindictiveness and aggressiveness and, hence, by a tendency to somatization in order to obtain secondary benefits.

A similar effect is observed in pollen-sensitive women, which is characterized by the formation of a complex psycho-type with increased indices on scales of D, Hy, Pd, Pa, Pt and Ma. This can denote emotional immaturity in these women in combination with anxiety, tension, irritability, suspicion, poor social adaptability and other negative effects.

The results of the study suggest that the main approach to treatment of patients with seasonal allergies should consider a combination of two treatment regimens—drug therapy and psychotherapeutic support of patients both during the exacerbation of the disease and at the stage of remission.

The psychological profiles of pollen-sensitive individuals should also be considered during the dissemination of pollen information.

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