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Diagnosis and Treatment of Seasonal Allergic Rhinitis

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Abstract: Allergic diseases represent a major health problem worldwide. Allergic rhinitis (AR) is the most common disease among both children and adults. According to WHO, "...more than 40% of the population of developed countries have signs of allergic readiness. Currently, the frequency of allergic rhinitis in the general population is 10–20%, and these figures tend to further increase this disease.

Keywords: Allergic rhinitis, seasonal allergic rhinitis, diagnosis of allergic rhinitis, treatment optimization, quality of life.

Allergic rhinitis (AR) is a fairly common pathology of the body in which the target organ is the nasal cavity, characterized by a symptom complex that includes swelling of the mucous membrane and nasal congestion, itching in the nasal cavity and sneezing, rhinorrhea and difficulty in nasal breathing. AR affects every fifth representative of all age groups of the population, while seasonal allergic rhinitis (SAR) accounts for about 68% of all allergic rhinitis [11].

The dominant point of view is that local disturbances of blood flow and functional disorders of the secretory cells of the nasal mucosa are caused by disturbances of autonomic innervation.

Among children with allergic rhinitis, there was a significant predominance of persons with the vagotonic type of initial autonomic tone (IVT) (53.9%), normotonic and sympathicotonic types of IVT were found in the same proportion. In case of year-round AR (CAR), the vagotonic type of IVT also predominated (56.8%) [17].

In 2009-2014 in our country, an increase in the incidence of AR was recorded at 13.5% (from 98.5 to 111.83 per 100,000 inhabitants) [8]. In Uzbekistan, studies were conducted on the incidence of AR in preschool children with pathologies of the ENT organs and a high incidence of SAR and PAR was noted even at this age [6, 7]. In the city of Tashkent, 42.7% of primary school students suffer from AR, more often boys, as well as 57.3% of 13-14 year old schoolchildren with a predominance of girls [10, 20].

A Vojacek (fluff) test was carried out: "one part of the nose was closed with a finger, and a light fluffy cotton wool (a string of gauze) was brought to the other and the subject was asked to breathe through the nose, if the patency was preserved, the cotton wool deviates in the rhythm of breathing, pay attention to the movements of the muscles of the wings of the nose - when breathing is difficult, they swell" [15]. The result was described in terms: free , satisfactory, difficult, absent.

The method of breathing spots (Zwaardemaker) was also used: "a polished metal plate on a handle (Glyatzel's mirror), which had previously been in the refrigerator, was sequentially brought to both parts of the nose , the plate had semicircles that served as a guideline for assessing the size of fogging, the patient was asked to breathe, wet the warm air that the patient

exhales forms condensation spots on the cold surface of the mirror; the adequacy of nasal breathing was judged by the size of these spots " [15]. The result was described in terms: free , satisfactory, difficult, absent.

The state of the transport function of the nasal mucosa was determined by recording the time of movement of the indicator from the mucous membrane of the NNR to the nasopharynx. An indifferent powder, saccharin, was used as an indicator.

The absorption function of the nasal mucosa was studied using the method of B.M. Sagalovich with applications of 0.1% atropine sulfate and increased heart rate over time [15].

The sense of smell in patients with SAD is standard according to V.I. Voyachek: "fragrant substances of olfactory action were used in ascending order of odors: 0.5% solution of acetic acid, wine alcohol, valerian tincture, ammonia" [15].

The assessment of the state of the ANS was carried out according to the characteristics of the initial autonomic tone (IVT), autonomic reactivity and autonomic support of activity (VOS). Autonomic tone and autonomic reactivity make it possible to judge the homeostatic capabilities of the body, and VOD - about its adaptive mechanisms. IVT was assessed based on the results of the standardized "Questionnaire for identifying signs of autonomic changes" by Guillaume - Vein and "Research Scheme for identifying signs of autonomic disorders" [15].

The "Questionnaire to identify signs of autonomic changes" was filled out by the subject, and the "Research Scheme to identify signs of autonomic disorders" was filled out by the doctor. The patient answered each question "yes" or "no" or specified parameters if necessary, after which the patient's scores were summed up. Using the same principle, the doctor filled out the "Research Scheme for identifying signs of autonomic disorders" and the patient's scores were summed up. Then a comparative assessment of the diagnostic information content of the table indicators was carried out.

We assessed autonomic reactivity using the Danini - Aschner oculocardiac reflex by recording heart rate (HR) for 30 seconds. Due to different initial heart rates (more or less than 70–72 per minute), we simultaneously carried out calculations using the Galyu formula.

To determine the adaptive and compensatory capabilities of the body, we performed an orthoclinostatic test on the examined patients.

To assess the autonomic parameters of the nervous system, we also determined the Kerdo autonomic index (VI) in the examined patients .

Quality of life was assessed using a special Mini questionnaire Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ). The questionnaire was filled out by the patients themselves. Patients assessed their condition in points: "0 – not bothered; 1 – barely noticeable anxiety; 2 – sometimes bothers you; 3 – moderately bothered; 4 – quite disturbing; 5 – very worried; 6 – extremely worrying" [15].

By us for the period 2020–2023. 126 patients with SAR aged 21–50 years were examined (average age 31.6±1.4 years), of which there were 52 men, 74 women. The average age of the observed men was 33.7±1.3 years, women – 29.2±1.5 years (Table 1).

The control group consisted of 32 practically healthy individuals, whose average age was determined to be 31.3 ± 1.6 years, without impaired nasal breathing and changes in the nasal cavity and nasopharynx during rhinoscopy.

Table 1. Distribution of patients in both groups, taking into account age and gender

Patient groups	Age groups				Total	
	18-44 years old (young age)		45-59 years (average age)			
	Abs	%	Abs	%	Abs	%
OG	109	86.51	17	13.49	126	100
Women	67	90.54	7	9.46	74	100
Men	42	80.77	10	19.23	52	100
KG	27	84.38	5	15.63	32	100
Women	17	89.47	2	10.53	19	100
Men	10	76.92	3	23.08	13	100

The diagnosis of SAR was made in accordance with generally accepted criteria based on complaints, a carefully collected anamnesis, duration of the process and objective examination, as well as on the results of laboratory tests. Information about the effectiveness and methods of previous therapy was taken into account.

When making a diagnosis, we adhered to the ICD 10 classification (class X - "Respiratory diseases", section "Other diseases of the upper respiratory tract" (J30-J39), J30.1 - Allergic rhinitis caused by pollen, J30.2 - Other seasonal allergic rhinitis) [29].

We used clinical, laboratory, ultrasound, instrumental, functional research methods, and also carried out statistical processing of the research results.

Using a visual analogue scale (VAS), the study patients subjectively determined the severity of SAD.

Generally accepted laboratory diagnostics included a general clinical analysis of peripheral blood (number of erythrocytes and leukocytes, hemoglobin, ESR, hemogram with counting of basophils, eosinophils, lymphocytes, monocytes, band and segmented leukocytes).

In order to confirm the allergic nature of SAR, a thorough ascertainment of the patients' own allergic history was carried out. The development included patients who at the time of the study had eosinophilia in peripheral blood and nasal smears.

The observed patients with SAD were examined for respiratory, transport, absorption, and olfactory functions.

A Vojacek (fluff) test was carried out: "one part of the nose was closed with a finger, and a light fluffy cotton wool (a string of gauze) was brought to the other and the subject was asked to breathe through the nose, if the patency was preserved, the cotton wool deviates in the rhythm of breathing, pay attention to the movements of the muscles of the wings of the nose - when breathing is difficult, they swell" [15]. The result was described in terms: free , satisfactory, difficult, absent.

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Table 2. Indicators of transport and absorption functions of the epithelium of the nasal mucosa in patients with SAR during an exacerbation

Study groups	MK (minutes)	BB (minutes)
City residents with SAD (n =32)	31.42±2.14*	28.53±3.18*
Rural residents with SAD (n =94)	29.67±2.17*	31.12±2.46*
LT SAR (n= 23)	24.12±2.13*, **	35.82±0.33*, **
ST SAR (n= 73)	29.48±2.15*, **	29.13±2.18*
TT SAR (n= 30)	35.73±2.49*	26.23±2.61*
All patients with SAR (n =126)	30.72±2.39*	30.83±2.85*
CG (n=32)	17.92±0.85	37.93±0.74

Note: * - P < 0.05 reliable in relation to the CG indicators,

** - P <0.05 significant in relation to TT SAR indicators

It should be noted that there is no significant difference in MK and VE between urban and rural residents with SAD, but there is a significant difference in their indicators with the results of practically healthy people. And also the presence of a statistically significant difference in groups with different severity of SAR among themselves and relative to the CG (P<0.05).

Conclusions:

1. Patients with SAD have the following variants of IVT: normotonia in 22.22% of cases, parasympathotonia – in 57.14% and sympathotonia – in 20.63% of cases. In the majority of patients (57.14%), shifts in autonomic homeokinesis and initial vagotonia are observed in combination with predominantly excessive hyperdiastolic type activity , which causes a more severe course of SAR.

2. With Doppler, the observed increase in blood flow in the vessels of the SVR in patients with SAR occurs due to the blood filling of the cavernous tissue and effusion edema of the soft tissues surrounding the vascular plexuses, its pressure from the outside on the walls of the vessels and, as a consequence, narrowing of the lumen of the venules and an increase in the lumen of the capillaries and arterioles due to excess pressure of the incoming blood flow, and excess pressure, in turn, leads to the effusion of the liquid part of the blood through the lumen of the vessels into the surrounding soft tissue.

3. The quality of life of patients with SAR showed a statically significant decrease in the sum of mini RQLQ scores during the period of remission of SAR by 41.73% of the maximum possible in the group of severe SAD, by 42.14% in the group of moderate severity of SAD and 38.03% in the group mild SAR ($p<0.05$). The average increase in mini RQLQ indicators during the period of pallination reached 64.28% of the maximum possible in the group of severe SAD, 62.12% in the group of moderate severity of SAD and 50.74% in the group of mild SAD.

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