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## **Allergic Rhinosinusopathy and Its Ethnic Characteristics among the Population of Eastern Siberia**

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*The work is devoted to research of the ethnic characteristics of allergic rhinosinusopathy spread among the population in Evenkia, as well as to clarification of its pathogenetic mechanisms. The author studied the spread and structure of allergic rhinosinusopathy among Caucasians and Mongoloids in Evenkia.*

*Using mathematical method of correlation adaptometry the author revealed the presence of significant correlations between the detected characteristics.*

*Keywords: allergic rhinosinusopathy, software module, method of correlation adaptometry, ethnic characteristics.*

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Allergic rhinosinusopathy (AR) is one of the chief problems of modern medicine, not only due to the rapid increase in its spread, but also because of its progress, as well as the modification of its course.

According a number of authors, the proportion of AR in the structure of allergic diseases is up to 60-70 %. Conducted in different countries epidemiological studies confirm a progressive rise in the AR incidence rate and its high prevalence. Only during the last decade the prevalence of allergic rhinosinusopathy has doubled [Med. Standards, 2001]. Currently there is quite a lot of research on the problem of the ethnic characteristics of otorhinolaryngological and allergical diseases of among the population of Eastern Siberia [Sitnikov, V.P., 1981; Smirnova S.V., 1997; Ignatov, I.A. et al., 1998, 2005; Cherniak, B.A. et al., 2002].

The population of the northern territories of Russia belongs to different ethnic groups. The distribution of HLA system genes among Mongoloids living in Siberia confirm some general patterns that are typical of the genetic structure of Mongoloid ethnic groups all over the world. These are a high frequency of genes HLA-A9, B15, B40, and the absence or a very low frequency of genes B8, B14, B18 and B21 [Fefelova, V.V., 1991].

The concept of allergic rhinosinusopathy is collective, defining both separate nosological form and pseudoallergic syndrome of background pathology. The characteristics are united by common diagnostic criteria regarding Nose and paranasal sinuses. Yet the characteristics differ in the etiology and pathogenesis. Regardless of the etiopathogenetic course of allergic rhinosinusopathy, common pathogenetic link is the release of inflammatory mediators, resulting in tissue damage. At the 11<sup>th</sup> National Congress on Respiratory Diseases in Moscow [2001] there were presented clinical and pathogenetic variants

of allergic rhinosinusopathy. Taking into account the main pathogenetic mechanism all kinds of allergic rhinosinusopathy were divided into two forms: real allergic rhinosinusopathy (RAR) and pseudoallergic one (PAR).

The purpose of the research is based on the study of the prevalence of real allergic and pseudoallergic rhinosinusopathy among the indigenous peoples (Mongoloid) and newcomers (Caucasians) in Evenkia; the aim is to identify ethnic characteristics of this disease.

The researchers studied population living in the basin of Podkamennaya (Stony) Tunguska and Khatanga rivers (in the villages of Baikit, Poligus, Surinda, Ekonda, Chirinda, Sulomai, Kuyumba, Vanavary) in order to identify the prevalence of allergic rhinosinusopathy. Total 4770 people aged 15 to 79 were studied. Among them the number of the indigenous people (Mongoloids) amounted to 1248 people (the average age is  $35,7\pm 0,55$ ; men – 594, women – 654), the number of newcomers (Caucasians) amounted to 3522 people (the average age is  $35,9\pm 0,78$ ; men – 1911, women – 1611). In addition, we examined the Kets (n = 73), the Yakuts (n = 33) and the Métis people (n = 62). Coverage of the surveyed population is 80.6 % of the newcomers, 83.7 % of the indigenous population. In forming the sample of those having allergic rhinosinusopathy we used the cohort cross-sectional single-step study of V.D. Beliakov et al., [2001].

In the course of selection of mathematical processing methods there occur certain difficulties in the process of statistical data processing [Gorban', A.N. et al., 1987]. To date, among the available software development there is no specialized integrated software package that allows to automatize the study of epidemiological data. We together with L.I. Pokidysheva, Candidate of Technical Sciences, the head of the department of the Faculty of Informatics and Computer Facilities in Krasnoyarsk State

Technological University developed multifactorial software module “Allergic rhinosinusopathy” and used the method of correlation adaptometry, which enabled to conduct a statistical analysis of the data with high quality and in a short time.

The software module works with a database of 4770 records along 78 parameters and contains detailed information about each patient. Files on all indicators contain codes on their gender, age, ethnicity, length of stay in the North, etc.

We investigated the prevalence of allergic rhinosinusopathy among Caucasians and Mongoloids in Evenkia. It is noteworthy that the AR rate among the coming population (Caucasians) is 2.2 times higher than among the indigenous population (Mongoloids) ( $P < 0,05$ ). The results are shown in Figure 2.

The prevalence of real AR among all the surveyed population in Evenkia is 11.7 per 1000 ( $P < 0,05$ ); among the coming population – 14.2 ( $P < 0,05$ ); among the indigenous population – 4,8 ( $P < 0,05$ ).

Pseudo-AR prevalence in the whole group of the surveyed is 10.3 per 1.000 ( $P < 0,05$ ); among the coming population – 11,6 ( $P < 0,05$ ); among the indigenous population – 6.4 ( $P < 0,05$ ). The prevalence of AR of mixed origin (MAR) is as follows: totally in the whole group – 1.0 per 1.000 ( $P < 0,05$ ); among the coming population – 1.1 ( $P < 0,05$ ); among the indigenous population – 0,8 ( $P > 0,05$ ).

While studying the structure of AR pathogenic forms among men and women from the surveyed ethnic groups of inhabitants of Evenkia we identified indicators of one direction only. Most people have real AR true: women (among the coming population – 38.1 %; among the indigenous population – 37.3 %), and among the coming men (48.1 %), the exception is the indigenous men who dominate in pseudo-AR – 44.1 % (Fig. 3).

Analysis of the structure of AR occurrence depending on the length of stay in the North showed a high percentage of incidence rate,

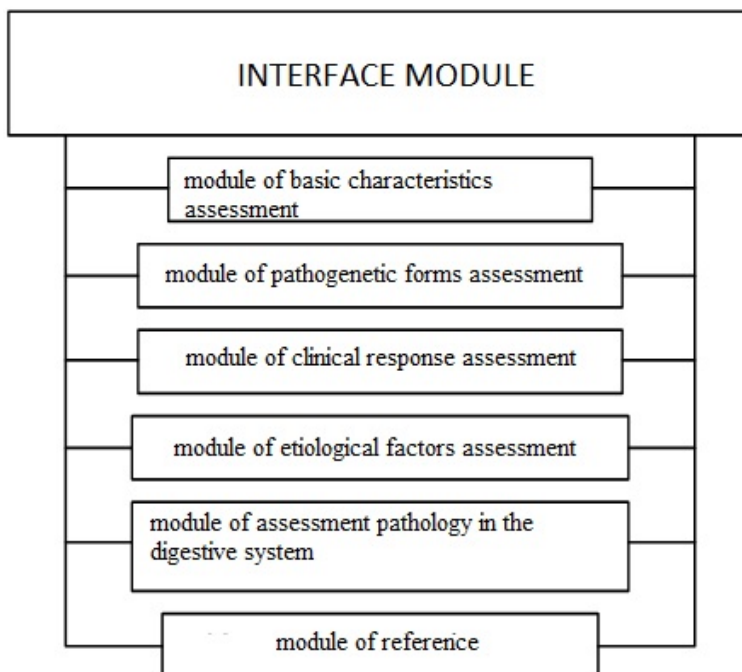


Fig.1. Software Module “Allergic rhinosinusopathy”

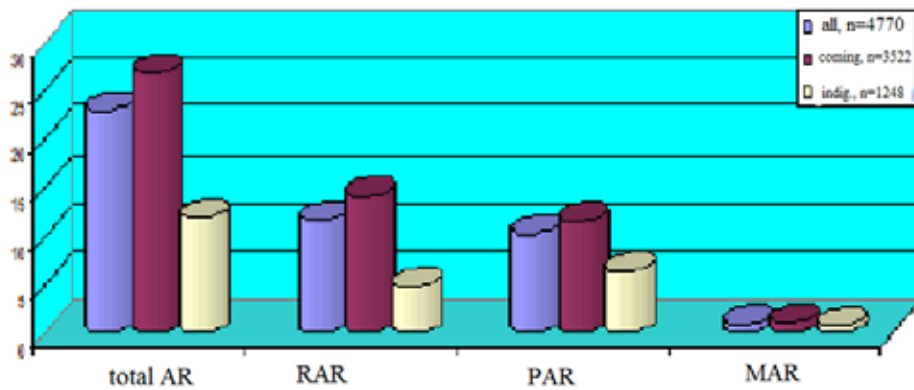


Fig. 2. Prevalence of pathogenic forms of AR among the coming and indigenous population in Evenkia

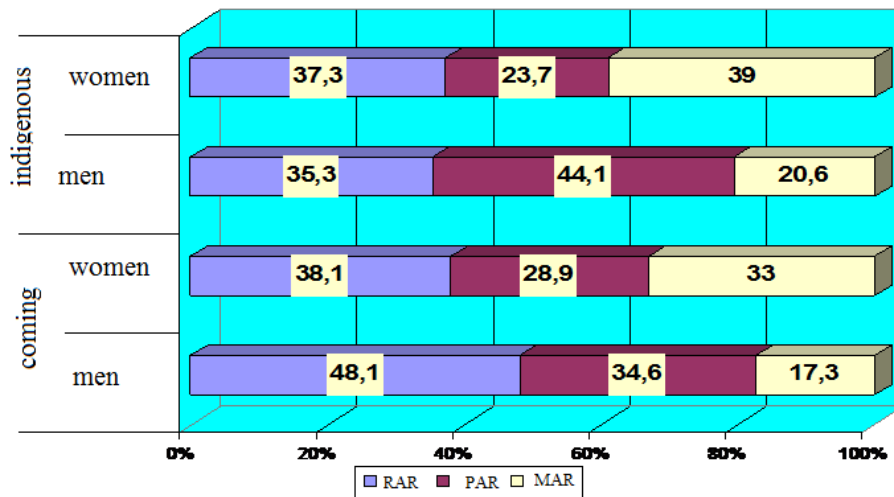


Fig. 3. The structure of the pathogenic form of allergic rhinosinusopathy among men and women of the indigenous and coming population in Evenkia

regardless of AR pathogenic forms in those age groups: “since birth”, “from 6 to 10” and “from 11 to 20 years”. So, in the total group of patients with AR “since birth” 32.2 % of them live in the North; 18.6 % is the rate among those “from 6 to 10”; and 36.4 % is the rate among those “from 11 to 20 years”. Among the coming population suffering from AR “since birth” 19.9 % of them live in the North; 24.3 % is the rate among those “from 6 to 10”; and 39.9 % is the rate among those “from 11 to 20 years”. Among the indigenous population suffering from AR “since birth” 70 %

of them live in the North; and 27.0 % is the rate among those “from 11 to 20 years”.

The results are shown in Fig. 4, 5.

The researchers also studied the structure of the combination of AR with other clinical manifestations of allergy (Fig. 6). Among the coming population the share of AR is 2 times more than among the indigenous population (31.5 % vs 14,9 %,  $P < 0,05$ ).

In the structure of AR incidence the disease is followed by other clinical manifestations of allergy like: general respiratory disease (GRD), nasal

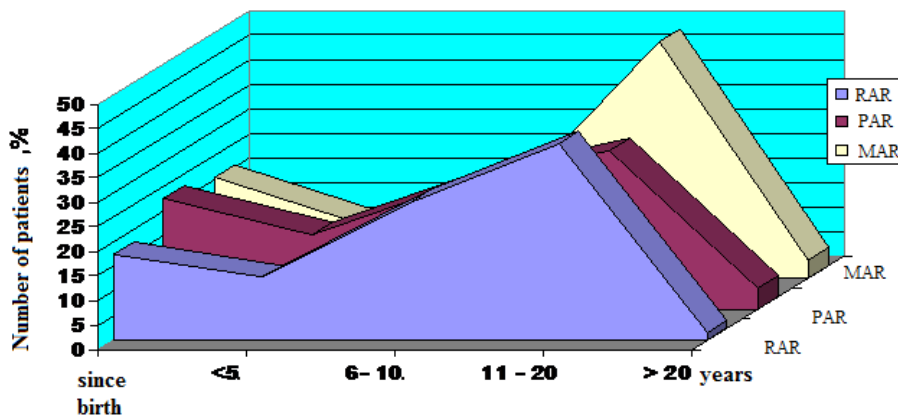


Fig.4. The structure of the AR incidence of Evenkia coming population depending on the length of stay in the North

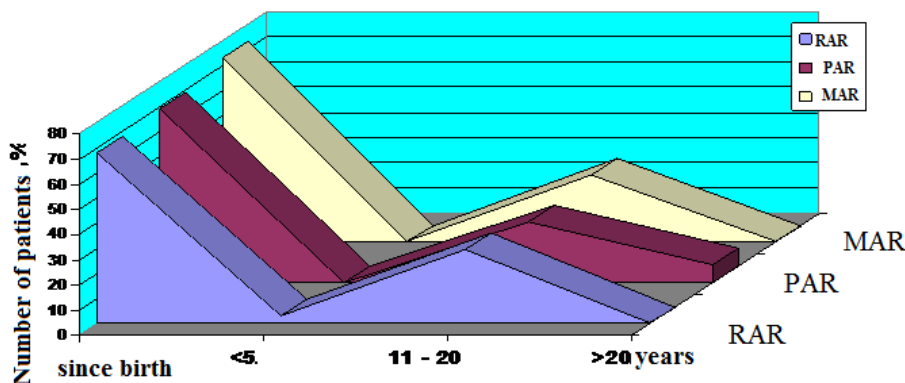


Fig.5. The structure of the AR incidence of Evenkia indigenous population depending on the length of residence in the North

conjunctival syndrome (NCS), dermatological respiratory syndrome (DRS). The most frequent is the combination of AR with skin manifestations. Analysis of indicators of the structure of clinical manifestations of allergy among the population of the North revealed a prevalence of DRS among the indigenous population (63.1 %, whereas this indicator among the coming population – 54.8 %). GRD dominates among the indigenous population (10.4 %, whereas this indicator among the coming population – in aliens). In both ethnic groups the most well-spread is pseudoallergic form of GRD, but to a greater extent it concerns

the indigenous population (6.0 %, whereas this indicator among the coming population – 3.0 %). NCS is the most often among the native population (11.6 %, whereas this indicator among the coming population – 5.7 %,  $P < 0,05$ ).

Summing up, it should be noted that there are some ethnic peculiarities of the prevalence of allergic rhinosinusopathy in Eastern Siberia (the incidence rate among the coming population – 26.9 per 1.000, among the indigenous one – 12.0 per 1.000). At the same time in the structure of AR incidence rate among male Caucasians real allergic rhinosinusopathy accounts to almost half of the

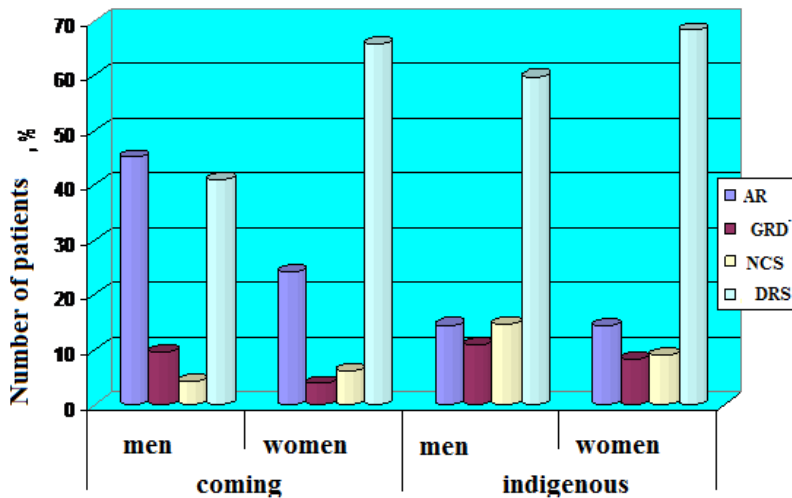


Fig. 6. The structure of the combination of AR with other clinical manifestations of allergy among men and women in Evenkia

cases (48.1 % versus 35.1 % of male Mongoloids), while the indigenous men are more likely to suffer from pseudoallergic rhinosinusopathy (44.1 % versus 34.6 % of male Caucasians). The indicators of AR structure among the inhabitants of Evenkia depending on the length of stay in the North also have their specifics: among the indigenous population 70 % of this group have been living in the North “since their birth”, while the coming population the group, which often suffers from allergic rhinosinusopathy (39.9 %), consists of people living in the North “from 11 to 20 years”. During the study of the prevalence of allergic rhinosinusopathy among the population in Evenkia depending on the etiological factor the researchers determined that the most common

cause of allergic rhinosinusopathy is nutritional factors, and the coming population suffers from allergic rhinosinusopathy connected food genesis 2 times more often than the indigenous population (76.0 versus 33.3 per 1000 people). This difference is statistically significant ( $P < 0,05$ ).

The identified ethnic peculiarities of the incidence of allergic rhinosinusopathy among the population in Evenkia are of great importance not only for future identification of the AR causes, but also for detecting its pathogenetic mechanisms. And this, in turn, will help determine the most reasonable way (from the standpoint of pathogenesis) to treat them therapeutically and to take preventive measures, thus improving ENT and Allergic medical service.

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## **Аллергическая риносинусопатия и ее этнические особенности среди населения Восточной Сибири**

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*Статья посвящена исследованию этнических особенностей заболеваемости аллергической риносинусопатией населения Эвенкии, а также уточнению ее патогенетических механизмов. Исследована распространенность и структура аллергической риносинусопатии среди европеоидов и монголоидов Эвенкии. С помощью математического метода корреляционной адаптометрии выявлено наличие достоверной корреляционной связи между обнаруженными особенностями.*

*Ключевые слова: аллергическая риносинусопатия, программный модуль, метод корреляционной адаптометрии, этнические особенности.*

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