IMMUNOANTIGEN STRUCTURE OF BLOOD GROUP IN CHILDREN WITH CHRONIC TONSELLITIS

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Abstract*. It is important to suggest that the problem of chronic tonsillitis remains relevant due to its high prevalence among the population, especially in childhood, and the likelihood of tonsillogenic complications [1,4]. Chronic tonsillitis (CT) is an infectious-allergic disease, manifested by a chronic inflammatory process in the tonsils and occurring, like many chronic diseases, with periods of remissions and exacerbations. This disease can be defined as a condition of palatine tonsils in which their natural protective functions are weakened or lost and they become a chronic source of infection, intoxication and allergization of the body [2,5].*

Keywords*: allergization, tonsillogenic, immunoantigenic, seromucoids, cardiointervalography.*

Definitely, all congenital and acquired diseases have genetic determination, and many of them have a polygenic predisposition. A specific disease of a child is genetically determined, however, the factors, that can realize these processes are refracted through a complex of endogenous and exogenous aspects. That's why genetic determination in the implementation of different pathologies in children, as a fundamental concept, which is included in the working hypothesis while carrying out these studies, where chemotherapy in children was chosen as a model [3,6,7].

The purpose of the study is to study the frequency of the presence in the blood of children with chemotherapy of the immunoantigenic structure of the corresponding blood group.

Materials and methods

The study is based on examination data of 192 children aged 4 to 14 years, patients with chemotherapy. General clinical research methods were carried out, including the presence of C-reactive protein in the blood, the content of total protein and protein fractions. The activity of transaminases (ALT, AST) was analyzed. Rheumatic tests were performed for DPA, seromucoids, and sialic acids. Instrumental methods were represented by electrocardiography (ECG), echocardiography (EchoCG) and cardiointervalography (CIG). A number of methods were used to determine the effect of inbreeding on the structure of susceptibility to chemotherapy and assess the clinical course of the disease. To determine the types of haptoglobin (Hp) and the phenotypes of ceruloplasmin (Cp), electrophoresis on a polyacrylamide gel was used in a modification, which makes it possible to obtain both the Hp types and the Cp phenotypes on the same phoregram.

Results and discussion

Undeniably, the results of the conducted studies fully confirmed the validity of the working concept while carrying out these studies. It is primarily applied to the most common antigens of the ABO system. Based on the frequency of blood groups O(I), A(II), it can be assumed that these antigens in the evolution of bioorganic systems in normal and pathological conditions are evolutionarily universal; it is on the basis of these blood groups that are considered as a unified structure of evolutionary development and distribution in different regions of the globe is compiled. This antigenic complex obviously is appearing at the stages of human evolutionary

development as an element of the biological essence of its body, later at certain stages of evolution began to acquire elements of pathological significance. Particularly, it is manifested in the fact that individuals of blood groups O(I) and A(II) are antigenically most extroverted to the effects of different biological factors (infectious, parasitic), which concretely increases the risk of developing pathological conditions in a significant way. So, in particular, these are individuals with blood groups O(I) and A(II), who are most susceptible to banal infectious and inflammatory diseases, immunopathological reactions of the first and second types. While the immunopathological state of the third and especially fourth types are more adherent to blood groups B (III) and AB (IV). As these studies have shown, these are CT diseases that dominate with the greatest frequency in children with group O(I) and A(II). At the same time, to a lesser extent with blood group B(III) and practically absent with blood group AB(IV). This anthology is fully consistent with the clinical manifestations of the disease. Namely: simple forms of chemotherapy are largely associated with O(I) and A(II) blood groups. B(III) and AB(IV) blood groups - with toxic-allergic manifestations of pathology (Table 1).

Table 1

Frequency indicators of blood group depending on clinical forms of chemotherapy in children (n=192)

Blood type	**Simple forms of chemotherapy**		**Toxic-allergic manifestations of chemotherapy**	
	Abs.	%	Abs.	%
O(I)	85	57,8±3,2	3	6,7±3,1***
A(II)	59	40,1±4,8	5	11,1±4,9±***
B(III)	3	2,0*±2,6	29	64,4±3,2±***
AB(IV)	-	-	8	4,2±2,9
Total	147	76,6	45	23,4

Note: * - reliability of data depending on the clinical manifestations of chemotherapy

It can be clearly seen from these positions, the infrastructure of the so-called cardio-tonsillogenic syndrome. Children with chemotherapy, with blood group O(I) and A(II), create a risk of vegetative-visceral neuroreflex mycardial dystrophies. At the same time, the condition of the heart should be considered as mycardosis - a consequence of neurogrophic changes in the myocardium. The principle diagram of this process can be presented as a chronic focus of infection in the manifestation of almond dysfunction in the higher parts of the autonomic nervous system. This is convincingly evidenced by the data on the state of synchrony of the function of the right and left parts of the heart in patients with chemotherapy, the manifestation of the phenomenon of vagal shortness of breath and other symptoms indicating the manifestation of a cardiac form of vegetative-vascular dystonia in children. Heart damage in children with chronic chemotherapy with blood group B(III) should be considered as a manifestation of toxic-allergic myocarditis and, accordingly, patients with blood group AB(IV) are able to realize type IV immunopathological reaction, namely rheumatism. The next stage of our study was to study the clinical and pathophysiological implementation of cardio-tonsillogenic syndrome among the examined children, which was recorded in 85.9% of cases. Clinical and pathophysiological implementation of cardio-tonsillogenic syndrome in children with chemotherapy, as studies have shown, is clearly differentiated depending on the antigenic blood group.

Along with this, the phase of damage to the tonsils is also characterized by a certain dependence of its expressiveness on the antigenic group affiliation according to the ABO system. The data is presented in Table 2.

Table 2

Clinical and pathophysiological characteristics of cardio-tonsillogenic syndrome in children with chemotherapy depending on blood type carriage

Blood group	Pathophysiological and pathomorphological characteristics of chemotherapy
O(I)	Dominance of the exudative phase of inflammation (swelling and blood filling of the tonsils)
A(II)	Predominance of the alterative-exudative phase (gaps are formed against the background of looseness and swelling of the tonsil structures)
B(III)	Predominance of proliferative-fibrous processes (fibrinoid effusion into the submucosal tonsils, manifestation “roller” of Karitsky)
AB(IV)	Dominance of proliferative granulomatous-sclerotic processes resulting in sclerosis of the lymphoid tissue of the tonsils (external sclerosis of the tonsils, formation of the sclerotic variant of Karitsky’s “roller”)

Definitely, a number of other antigens also determine the pathophysiological phenotype of inflammatory processes in general and during chemotherapy in particular. In this regard, comparison of the frequency of occurrence of various antigens of the ceruloplasmin system with the clinical manifestations of Status localis and the body-wide reactive state made it possible to identify a number of immunogenetic and clinical comparisons. Namely, the AB ceruloplasmin phenotype clearly correlates with a tendency to alternative exudative manifestations of inflammation at the level of lymphoid structures in the nasopharynx ($r=0.695$; $P<0.01$), while the AB phenotype is more associated with proliferative-sclerotic tendencies in the implementation of inflammatory processes ($r=0.548$; $P<0.05$). These aspects, of course, leave their mark on the clinical and morphological manifestation of chemotherapy, namely, the predominance of loose components, congestive hyperemia, the presence of purulent plugs, on the one hand, and the tendency to sclerotic changes in the structure of the tonsils with dry fibrinoid effusion. In connection with the above provisions regarding the ABO antigenic system, it can be stated that in determining the nature of inflammation of the lymphoid structures of the nasopharynx and, obviously, in the integrity of the body, a combination and complementarity of antigens O(I) group, A(II) group, with one on the other hand, and the AB ceruloplasmin antigen on the other. At the same time, antigens B(III) and AB(IV) of the ABO system are largely associated with ceruloplasmin B in the processes of clinical and morphological manifestations of chemotherapy in children. The differentiated influence of ceruloplasmin antigens is clearly regulated by the test for clinical pathophysiological changes of the sympathoadrenal type with ceruloplasmin antigen B, and at the same time, the AB antigen is more associated with parasympathetic changes in the body. The results of clinical and immunogenetic comparisons in patients with chemotherapy were confirmed by the results of a mathematical analysis of pairwise correlations between the frequency of the presence of O(I), A(II) antigens, on the one hand, and ceruloplasmin AB, on the other ($r=+0.8561$, $P<0,01$). While the B(III) and AB(IV) antigens correlated with the frequency of ceruloplasmin phenotype B quite reliably ($r=+0.5674$, $P<0.05$). From the presented data it follows that the nature of inflammation in the body in general and specifically in Status localis has a clear

immunogenetic determination, which determines the phase structure of inflammation and the severity of each phase.

Thus, we can conclude that the involution of lymphoid tissue, along with other mechanisms, is largely determined by the immunoantigenic complexes of ceruloplasmin and, in particular, the AB antigen. This is quite consistent with the morphology of inflammation, since the combination of the frequency of occurrence of AB ceruloplasmin with the exudative-alterative phase of inflammation creates the prospect of persistent inflammation. At the same time, the ceruloplasmin B phenotype promotes a tendency toward proliferation and sclerosis of lymphoid tissue.

Conclusions:

1. It has been established that the highest risk of chronic tonsillitis occurs in children with blood groups O(I) and A(II).

2. The immunoantigenic structure corresponding to blood group A(II) is associated mainly with simple forms of chemotherapy, and children with blood group B(III) and AB(IV) are associated with toxic-allergic manifestations of pathology, in which cardiac complications most often develop.

3. Clinical-immunoantigenic correlation characterizes the presence of the AB ceruloplasmin phenotype to alterative exudative inflammation of the lymphoid structures of the nasopharynx. The phenotype is largely associated with proliferative-sclerotic tendencies in the implementation of chemotherapy in children.

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