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Features of cellular immunity in adolescents of the Far East region

Native and non-native adolescents of the Sakha (Yakutia) Republic and Khabarovsk were surveyed. The features of the phenotypic characteristics of peripheral blood lymphocytes in the young indigenous of Yakutia were revealed. The revealed regional features of the immune status of Sakha (Yakutia) Republic adolescents are considered as adaptive, aimed at compensation of the effects of climatic, technological and emotional environmental factors.

Keywords: cellular immunity, adolescents, Far Eastern region.

Introduction

Is now generally accepted that the immune system is one of the earliest and most sensitive indicators of adverse effects on the environmental factors and may serve as a criterion of a significant risk of disease and dysfunction of the immune system may be responsible for up to 2% of child

mortality[5].

The immune system is an extremely complex system consisting of rapidly multicomponent and resting cells. Therefore, it is highly sensitive to the effects of various anthropogenic factors that determine the relevance of studying the immune response in children during the period of active growth and development [4]. Unfavorable climatic, ecological and geographical characteristics of the Far East region is largely determined not only by the formation of Regional Pathology and structure of infant morbidity, but also, primarily, is one of the reasons for changes in statutory rates. One of the conditions for the assessment of immunological resistance is the presence of regulatory indicators of immune status, characterized by regional specificity, due to climatic and geographical, social and living conditions and to a certain extent, the ethnic factor [1,2]. Therefore, when conducting immunological studies for the analysis of various physiological and pathological conditions in adolescents should take into account the level of immunological parameters of apparently healthy pediatric population [3].

Given the improvement of material-technical base, the regulatory framework, indicators are not absolutely unchanged immune status is necessary to investigate from the standpoint of modern immunological concepts to appropriate diagnostic and preventive measures, as well as the use of adequate and effective immune. Since the existing rules on the majority of indicators

developed in recent years of the last century, the relevance of determining the values of apparently healthy population is very timely. In connection with this study was to determine the features of cellular immunity in adolescents in the climatic and environmental conditions of the Far East.

Materials and method

We examined adolescents Republic of Sakha (Yakutia), indigenous and migrant populations, a comparison group were practically healthy students of secondary schools in the city of Khabarovsk. The sample of 65 adolescents aged 10 to 14 years. The material for immunological studies served as the peripheral blood of healthy children who do not have the time of the survey and in the preceding month of acute exacerbations of chronic diseases and pathology. Identification of membrane markers of different clones of T-lymphoid populations was performed with a panel of monoclonal antibodies using imported ("Becton Dickinson") on the flow cytometer FACSCalibur firm "Becton Dickinson". Designation of clusters of differentiation (CD) is given in accordance with international classification adopted at the 4th International Meeting on differentiation antigens of human lymphocytes. The panel of monoclonal antibodies consisted of six markers to the following populations of lymphocytes: $CD3^+/CD45^+$ (mature T-lymphocytes), $CD19^+/CD45^+$ (mature B-lymphocytes), $CD3^+/CD4^+/CD45^+$ (T-helper/inductors), $CD3^+/CD8^+/CD45^+$ (T-suppressors/cytotoxic), $CD3+/CD25^+$ (marker of lymphocyte activation), $CD(16+56)/CD45^+$ (natural killer cells), $CD3^+/HLA\text{-}DR^+$ (activated T and B lymphocytes).

Results and Discussion

The sensitivity of individual links the immune system to environmental factors varies. This leads to the formation of the body changes prenosological immune reactivity, which, on the one hand, are markers of unfavorable environmental conditions, and on the other - provide the basis for the subsequent development of disease, chronic or worsening of existing diseases. Conducting research on cellular immunity, we obtained the following data. In adolescents, the indigenous population of Yakutia was noted higher rates of the total number of lymphocytes in the peripheral blood compared with those in the comparison group (47,12±3,21 and 39,5±1,5%, respectively), while the newcomers population of Yakutia is defined statistically significant decrease in lymphocytes ($p < 0.01$).

As a result, studies have identified the following features of phenotypic characteristics of peripheral blood lymphocytes. Reduce the percentage of $CD3^+/CD45^+$-lymphocytes in young indigenous occurred mainly at the expense of lymphocytes expressing CD4, whose number is significantly different from that of the index in adolescents Khabarovsk (41,0±1,13 and 29,82±1,55%,

respectively). In adolescents, the alien population there was a marked reduction of lymphocytes with $CD3^+$-phenotype (1.8-fold) relative to the comparison group, and the decline was mostly on the phenotype, which characterizes the $CD3^+/CD4^+/CD45^+$-subpopulation. Changing the number of regulatory lymphocytes, both helper-inductor properties and to suppressor-cytotoxic activity, could not affect the index of the ratio of these subpopulations. As a result, the immunoregulatory index was reduced in both groups of young native and alien population of the Republic of Sakha (Yakutia) with a high degree of confidence ($p<0.01$ and $p<0.001$).

The relative and absolute content of B-lymphocytes in young indigenous people were not significantly different from the same indicator in the comparison group, while the alien population was reduced by 1.6 times. The number of NK cells characterized by expression of CD(16 +56)/$CD45^+$, was reduced both in adolescents indigenous and alien population, and was 4,20±0,73 and 4,32±1,01% (in comparison group: 14,5±1,02%). A similar situation was observed with respect to lymphocyte population with the phenotype $CD3^+$/HLA-DR^+: a young indigenous and migrant populations, and 11,69±1,41 10,61±2,19%, respectively, in the comparison group 17,2±1,13%.

Conclusion

Thus, almost all teenagers Yakutia indicators of cellular link of immunity was significantly reduced compared with those characterizing the magnitude of cellular immunity teenagers Khabarovsk Krai. The regional characteristics identified the Republic of Sakha (Yakutia) are regarded as adaptive, designed to compensate for the adverse effects of climatic and geographical, technological and psycho-emotional factors of the environment. More pronounced features of cellular immunity in adolescents coming population of Yakutia indicate that inhibition of immune reactivity and reducing the reserve capacity of adaptation mechanisms in the unique regional conditions that may be pathogenetically important background for the formation of immune-mediated diseases.

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