

# The State of Cellular Immunity in Children with Infectious Mononucleosis

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**Resumé:** The main feature of infectious mononucleosis in children is the defeat of the immune system, primarily the T-cell link. Undoubtedly, the low number of CD4 + lymphocytes is associated with reduced resistance to secondary infections. This requires an inadequate immunological response and leads to the chronicity of infectious processes.

**Keywords:** infectious mononucleosis, T-cell link,

**Relevance.** Infectious mononucleosis is an acute anthroponotic viral-infectious disease that is characterized by fever, generalized lymphadenopathy, tonsillitis, damage to the liver and spleen with changes in immune status [1,3]. Infectious mononucleosis is recorded mainly in children and young people, more often males. The disease occurs everywhere in the form of sporadic cases. Epidemic outbreaks are observed very rarely. The maximum incidence occurs in the cold season [4]. A special place among herpesviruses is occupied by infection caused by the Epstein-Barr virus (EBV) infection, is one of the most relevant and common diseases in modern pediatrics and pediatric infectology, as well as among the adult population [5]. One of the most common forms of EBV infection is infectious mononucleosis (MI) [6]. Immune disorders in infectious mononucleosis are complex, they relate to both the cellular and humoral link, entail a heavier course, an increase in the complications of the disease, which reflects the essence of infectious mononucleosis as a disease and a millionth system [6]. Analysis of the state of the immune status in conjunction with changes in the cytokine spectrum in children with infectious mononucleosis has not been conducted in the literature available to us to date, which served as the basis for setting the goal of the study.[ 7]

**The purpose of the study:** the state of cellular immunity in children with infectious mononucleosis.

**Materials and methods of research.** We conducted studies of the immune system in 22 children with infectious mononucleosis, which made up the main group. At the same time, 22 children of the control group underwent an immunological examination during the period of exacerbation of the disease and in remission. Indicators of cellular immunity in all children with infectious mononucleosis were compared with the indicators of the control group of sick children. The average age of the examined children was  $7.5 \pm 0.45$ . All the examined children received generally accepted therapeutic measures.

**The results** of the study of the average parameters of T-cell rings infected with infectious mononucleoz are presented in the table.

**Table**  
**Mean number of T-cell rings in children with infectious mononucleosis**

| Index                   | The period of exacerbation of the disease | Period of remission of the disease | Control group    |
|-------------------------|---|------------------------------------|------------------|
| Leukocytes, cl/ $\mu$ l | 4231 $\pm$ 49***                          | 2211 $\pm$ 69***                   | 2023 $\pm$ 148   |
| Lymphocyte %            | 23,8 $\pm$ 2,0**                          | 24,6 $\pm$ 2,0***                  | 24,2 $\pm$ 0,78  |
| CD3+, %                 | 49,8 $\pm$ 2,30**                         | 48,3 $\pm$ 4,57***                 | 55,83 $\pm$ 0,97 |
| CD4+, %                 | 20,3 $\pm$ 0,97***                        | 20,2 $\pm$ 0,62***                 | 20,17 $\pm$ 1,30 |

|               |               |              |            |
|---------------|---------------|--------------|------------|
| CD8+, %       | 27,8±1,19***  | 28,1±1,34*** | 23,67±0,88 |
| IRI (SD4/SD8) | 0,75 ±0,04*** | 0,75±0,05*** | 1,36±0,19  |
| CD16+, %      | 17,2±0,84*    | 17,1±0,83*   | 18,40±1,15 |
| SD20+, %      | 21,8±0,81*    | 20,8±1,36**  | 23,17±1,17 |
| SD25+, %      | 12,8±0,49***  | 14,7±0,97*** | 22,34±0,83 |
| SD38+, %      | 37,3±1,68***  | 36,3±1,60*** | 21,18±0,63 |
| CD95+, %      | 34,7 ±1,20*** | 37,6±1,42*** | 21,14±0,58 |

Note: \* - difference compared to the data of the control group (\* - P<0.05.)

In peripheral blood, the structural percentage of lymphocytes decreased without displacement, which, in turn, did not differ from the normative indicators. Thus, in children infected with infectious mononucleosis, there was an increase in the number of leukocytes due to inflammation in the peripheral blood, the absolute number of lymphocytes compared to the control group statistically increased (P<0.001).

The results of the analysis of the T-cell link of immunity showed that the number of T3 + lymphocytes in the children of the main group was lower than in the control group. In the control group, the amount of T3+ was 55.83±0.97%, and in the main group this indicator during the exacerbation period averaged 49.8±2.3% and in period remission 48.3±4.6% (R<0.05).

Analysis of subpopulation parameters of T-cells of the immune system, inclusion of regulatory CD4 + and DM8 + lymphocytes showed a 1.6-fold decrease in T-helper / inducers (T-cell4 +) in the peripheral blood of children infected with infectious mononucleosis. The reason for the increase in the total number of leukocytes, the amount of T-lymphocytes went in parallel with the increase in absolute indicators. It is likely that T-lymphocyte inducers/helper cells had a function of immune control with a parallel decrease. Thus, the relative number of T helper/inducers in the children of the main group in the study was significantly lower than in the children of the control group (R<0.05).

When analyzing the subpopulation composition of the immune T-cell link, it was found that the number of T helper cells / inducers (TD4 +) in the main group of children decreased by 1.6 times. Judging by the high values of leukocytes, the absolute number of T-lymphocytes tended to increase. The ratio of TD4 + / CD8 + (immunoregulatory index - IRI) showed an incredible decrease (R>0.05) compared with the control group and the comparison group. In the children of the main group, the range of individual values of IRI ranged from 0.45 to 0.97, but in most patients with IRI was below 0.80.

A change in IRI in this case was observed as a result of a decrease in T4 + lymphocytes and an inaccurate increase in T8 + lymphocytes. On our part, it was found that the number of T8+-lymphocytes did not significantly differ from the indicators of the control group. It can be seen that the presence of an immunodeficiency state in children depends on the presence of an infectious process and a deficiency of an inadequate immune response to the pathogen.

The deficit of the T-lymphocyte population in children of the main group in this case is mainly due to a decrease in the T4 + helper / inducer, which is a necessary link in the regulation of adequate inflammatory processes and the regulation of the formation of killer cells that directly destroy infectious agents. Analysis of the data obtained revealed the presence of reliable results between the indicators of children of the control and main groups.

Thus, the state of T-cell immunotancy, expressed in children of the main group, was expressed by immunoregulatory immunodeficiency of subpopulations of T-lymphocytes, strongly pronounced T4 + T-immunodeficiency of cells and CD8 + T-cytotoxic lymphocytes with an increase in the number in peripheral blood.

A comparative analysis of the expression of DM16 + lymphocytes revealed the uncertainty of a significant increase in the comparative analysis of the indicators of children of the control group and the main group (R>0.05). Thus, the number of T16+ diabetes in children of the main group during the period of exacerbation of infectious mononucleosis was 17.2±0.84% against 18.4±0.38% and 18.09±1.03%, which is 1.3 times higher than in the control group. The results of the analysis of B-lymphocytes showed a tendency to

reduce T20 + lymphocytes and their markers in children of the main group, but no significant difference was detected. The fact is that this is due to the fact that T20 + is a marker of B-lymphocytes, during the inflammatory process, especially in children, there is a violation of the production of lymphocytes, so immunocompetent cells lose their maturation property and function.

Analysis of the relative amount of T25+ in the children of the main group showed a significant difference compared to the indicators of the control group. Interestingly, this decrease in the expression of T25 + lymphocytes is associated with the effect of interleukin-2 deficiency on the immaturity of immunocompetent blood cells, which in turn indicates the presence of an immunodeficiency state in children with infectious mononucleosis.

Analysis of the amount of T2D38 + in children of the main group showed a significant difference compared to the values in the control group, and such a decrease in the expression of CD38 + lymphocytes is associated with the effect of interleukin-2 on the immaturity of immunocompetent blood cells, which in turn leads to immunodeficiency in children with infectious mononucleosis.

Analysis of markers of late activation of T95+ in children of the main group showed that in children with infectious mononucleosis, a significant difference was revealed between the analysis of children of the control group, since the relative and absolute number of CD95 + lymphocytes significantly increased compared to the control group.

**Conclusions.** Thus, the cellular immune response was characterized by a highly developed state of T-cell immunodeficiency in children of the main group, characterized by a decrease in the relative number of T3 + lymphocytes, an increase in T4 + T helpers / inducers due to SD8 + T-cytotoxic lymphocytes and a decrease in the immunoregulatory index. Qualitative and quantitative changes in the expression of T25+ and T95+ lymphocytes indicate a clear inflammatory process in children with infectious mononucleosis.

#### References used.

1. Belozarov E. S. Immunodeficiencies and donozological forms of immunosuppression / E. S. Belozarov, N. K. Shagshardanov, E. I. Zmushko. - Semipalatinsk, 2008. pp. 141–163.
2. Boshyan R. E. Infection caused by epstein-Barr virus: epidemiological manifestations and laboratory diagnostics: Avtoref. dis
3. cand. honey. Sciences. - M., 2018. - 42 p.
4. Burmagina I. A., Pozdeeva M. A., Agafonov V. M. Infectious mononucleosis in the Northern region // *Sovremennaya meditsina: actual voprosy*. - 2014. - № 33. - S. 26-31.
5. Volokha A. P. Epshteyna-Barr viral infection in children // *Sovremennaya pediatricsya*. - 2015. - No 4 (68). - P. 103
6. Keldiyorova Z.D. Immunological features of infectious mononucleosis epstein-barr-viral etiology in children.// *New Day in Medicine. Bukhoro* - No. 2 (34). 2021. C. 231-234
7. Keldiyorova Z.D. The state of the immune system in children with infectious mononucleosis and the rationale for immunocorrifying therapy.// *Central Asian Journal of Medical and Natural Sciences*.
8. Keldiyorova Z.D., // State of the immune system in children with infectious mononucleosis.// *New day in medicine. Бухоро* -1 (33) 2021. C. 283-286
9. Аслонова.М.Р. (2021). Возникновение Случаев Гиповитаминоза Из-за Гельминтозов// *CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES*. – 2021.- P. 46-50.
10. Aslonova.M.R. (2022). Determination of suicidality against the background of Parasitic Diseases in children // *INTERNATIONAL JOURNAL OF PHILOSOPHICAL STUDIES AND SOCIAL SCIENCES*. – 2022.- P. 9-12.