Study of the State of Immunity in Chronic Obstructive Pulmonary Disease in Children

Ibatova Sh.M	Samarkand State Medical University, Samarkand, Uzbekistan
Islamova D.S	Samarkand State Medical University, Samarkand, Uzbekistan
Kodirova Sh.S.	Samarkand State Medical University, Samarkand, Uzbekistan

ABSTRACT

In the development of chronic obstructive pulmonary disease in children, the premorbid background of the child and the state of the general reactivity of the body play an important role. Among the endogenous factors that determine the degree of likelihood of developing this disease, great importance is attached to immunological processes. The use of various means aimed at enhancing immunity significantly increases the effectiveness of treatment. In this regard, we studied the state of immunity in sick children with chronic obstructive pulmonary disease. The indicators of cellular and humoral immunity were studied in chronic obstructive pulmonary disease in children. The studies carried out confirm the significant pathogenetic significance of immunological deficiency in the course of chronic obstructive pulmonary disease in children and indicate the need for its correction.

Keywords: Chronic obstructive pulmonary disease, patients, state of immunity, cellular immunity, humoral immunity, immunoglobulins.

Introduction

Domestic pediatricians have shown that the premorbid background of the child and the state of general reactivity of the body play an important role in the development of chronic obstructive pulmonary disease in children [1,2,7,19]. Among the endogenous factors that determine the likelihood of developing this disease, great importance is attached to immunological processes [3,4,5,11,14,17,20].

The course and outcome of a chronic inflammatory process in the lungs largely depends on the state of immunological reactivity.

The study of the state of immunity in this pathology in children began long ago. Currently, immunological changes in chronic bronchopulmonary diseases have been studied sufficiently in [6,9,12,16,22]. Despite the contradictory data on immunity indicators, we can already talk about the practical significance of these studies for the correction and control of the effectiveness of treatment [8,10,13,15.18,21].

. The use of various means aimed at enhancing immunity significantly increases the effectiveness of treatment.

In this regard, we studied the state of immunity in sick children with chronic obstructive pulmonary disease.

Purpose Of the Study

To study the indicators of cellular and humoral immunity in chronic obstructive pulmonary disease in children.

Materials And Research Methods

We examined 100 sick children with chronic obstructive pulmonary disease who were inpatient treatment in the children's department of the SamMI clinic No. 1 from 2011-2018. I - group consisted of 30 patients aged 3-7 years (with deformation of the bronchi - 24 patients; with bronchiectasis - 6), II group - 70 patients aged 8-15 years (with deformation of the bronchi - 46 patients; with bronchiectasis - 24). Tests of the first and second levels were investigated: the release of lymphocytes according to Boum (1974) on a ficcol - verografin gradient with a density of 1.077 g / cm. The number of circulating T-lymphocytes was estimated by the method of spontaneous rosette formation according to Jondal et.all., (1972). Determination of immunoregulatory subpopulations of T-lymphocytes, T-suppressors, T-helpers and B - rosette-forming lymphocytes (in reaction with erythrocytes of mice) was carried out according to I.V. Ponyakina and K.A. Lebedev (181). For the quantitative registration of antigen-binding lymphocytes (ASL) circulating in the peripheral blood, we used the method of indirect rosette formation proposed by F.Yu. Garib (1988). The content of the main classes of immunoglobulins A, M, G in blood serum by radial diffusion in agar according to Manchini et.all., (1965). Determination of the CEC level in blood serum was performed using a standard test system. Phagocytic activity of neutrophils was assessed according to the generally accepted method with a suspension of staphylococcus.

The diagnosis of chronic obstructive pulmonary disease was verified on the basis of a thorough collection of life history and medical history of the child, data from clinical, bacteriological, immunological, radiological, as indicated by bronchoscopic and functional research methods.

Results And Discussion

Studies have shown that in terms of immunological reactivity, patients with this pathology significantly differed from healthy children. The study of immunity indicators was carried out by us at admission of patients in the phase of exacerbation of the disease, at discharge from the hospital and in 56 patients in the follow-up.

The results of immunological studies depending on the age of the patients are presented in Table 1.

Table 1. Parameters of cellular immunity, FAN, ASL and CEC in chronic obstructive pulmonary disease in children on admission in the acute phase (M ± m)

Indicators	Healthy children		Children with chronic obstructive pulmonary disease	
	3 - 7 years	8- 15 years	3- 7 years	8 -15 years
T– limf.,%	59,1±1,03	58,1±1,18	42,94±1,31 P<0,001	40,7±1,2 P<0,001
T- abs. thousand / μkl	1,84±0,11	1,51±0,13	1,26±0,1 P<0,01	1,17±0,06 P<0,05
T– help.,%	43,9±0,69	46,1±0,93	33,97±0,94, P<0,001	33,93±0,83, P<0,001
T– suppress.,%	7,8±0,41	8,2±0,63	5,87±0,45, P<0,05	5,8±0,32, P<0,05
B– limf.,%	11,6±1,29	12,3±0,99	10,56±0,56, P>0,1	9,95±0,48 P<0,05
abs. thousand / μkl	0,36±0,04	0,3±0,05	0,39±0,03, P>0,1	0,31±0,02, P>0,1
Phagocytosis,%	55,6±0,76	58,4±1,21	42,52±1,19, P<0,001	41,24±0,96, P<0,001
abs. thousand / μkl	2,3±0,15	2,35±0,13	2,01±0,12, P>0,1	1,96±0,1, P<0,01

ASL, %	1,0±0,08	1,0±0,08	4,2±0,09 P<0,001	5,86±0,11 P<0,001
CEC %	94,5±1,0	96,8±1,2	149,2±9,17 P<0,001	177,9±8,42 P<0,05

Note: P - significance of the difference between the indicators of healthy children and children with chronic obstructive pulmonary disease.

A significant decrease in the relative number of T lymphocytes was established in all age groups, 42.94 ± 1.31% (P <0.001); 40.7 ± 1.2% (P <0.001) compared with the control group 59.1 ± 1.03%; 58.1 ± 1.18%, respectively, the absolute number of T-lymphocytes P <0.05 also changed.

There was also a significant decrease in T-helpers 33.97 ± 0.94% (P <0.001); 33.93 ± 0.83% (P <0.001); and T-suppressors 5.87 ± 0.45% (P <0.05); 5.8 ± 0.32% (P <0.05) in the stage of exacerbation of the disease.

The study of the content of B-lymphocytes revealed a significant decrease in the relative content in children aged 8 to 15 years 9.95 ± 0.48 P <0.05, in the absence of significant shifts at the age of 3-7 years (P> 0.05) ... When analyzing the absolute number of B lymphocytes, no significant deviation from the norm was found in all patients (P> 0.1).

Analysis of the results of the study of serum immunoglobulins showed that in the majority of children 54 (77.1%) at the age of 8-15 years there was an increase in the level of immunoglobulins of all classes (P <0.05), which is a normal reaction to prolonged irritation, in the remaining 16 patients in 22.9% of cases, there was some decrease in Ig A (P> 0.1), IgM (P> 0.1) and a significant increase in IgG (P <0.05).

The level of immunoglobulins A, M, G at the age of 3-7 years did not significantly differ from the control group of healthy children, however, in 27% of patients, the IgG content was significantly increased (P <0.001).

Indicators of humoral immunity in chronic obstructive pulmonary disease in children, depending on age, are presented in Table 2.

Table 2. Indicators of humoral immunity in chronic obstructive pulmonary disease in children (M ± m)

Indicators	Healthy children		Children with chronic obstructive pulmonary disease	
	3 - 7 years	8- 15 years	3- 7 years	8 -15 years
IgA, г/л	0,81±0,04	1,18±0,09	1,1±0,07, P>0,1	1,67±0,07, P<0,05
IgM, г/л	0,86±0,06	1,01±0,13	0,94±0,06, P>0,1	1,29±0,06, P<0,02
IgG, г/л	9,35±0,27	9,03±0,56	10,85±0,18, P<0,001	10,92±0,16, P<0,001

Note: P - significance of the difference between the indicators of healthy people and in children with chronic obstructive pulmonary disease.

The given data on the state of humoral immunity can be explained as a consequence of a prolonged inflammatory process, on the constant tension of the humoral immunity system. All this indicates the mobilization of the body's defenses mainly by the humoral route, which is not effective enough, since there is a decrease in cellular immunity, which should be taken into account when prescribing a complex of therapeutic effects.

A significant increase in immunoglobulins in 77.1% of patients aged 8-15 years indicates that the longer the disease lasted, the more immunoglobulins increased. This can be assumed by the greater maturity of the immunogenesis apparatus in patients 8-15 years old than at the age of 3-7 years. A

significant increase in IgG in all groups of patients indicates that organic damage to the bronchopulmonary tissue is accompanied by sensitization.

We studied the state of the antigen-specific link of the immune system by identifying antigen-binding lymphocytes (ASL) sensitized to tissue antigens of the lung.

The results of the study showed that in chronic obstructive pulmonary disease, a pronounced immune response develops with an increase of 5.86 ± 0.11% in the blood content of ASL to the pulmonary antigen in children aged 8-15 years and 4.2 ± 0.09% in at the age of 3-7 years compared with the group of healthy children 1.0 ± 0.08 (P <0.001).

Under the conditions of the nonequivalent ratio of antigen and produced antibodies, prerequisites for the formation of organ fixation of the CIC with the implementation of their pathogenetic effect on target organs are created [10]. As can be seen from the data shown in Table 1, in patients in the exacerbation phase, the CEC concentration was significantly increased in all age groups (P <0.001 <0.05). The revealed increase in the CEC is apparently associated with constitutionally altered or acquired immunological reactivity. When studying the parameters of immunity, we noted a more pronounced decrease in T - and B - cellular immunity in patients with bronchiectasis and severe condition with pulmonary heart disease (P <0.05), compared with patients with bronchial deformity and moderate severity. The content of immunoglobulins A, M, G was also high, both in comparison with the norm (P <0.05) and in comparison with the indicators of patients with bronchial deformity and moderate condition (P <0.05).

Conclusions

Thus, the studies carried out confirm the significant pathogenetic significance of immunological deficiency in the course of chronic obstructive pulmonary disease in children and indicate the need for its correction.

References

1. Ageikin V.A. Chronic bronchopulmonary diseases in children. // Medical science. and educational-method.zhur., No. 24, 2005, p. 7-31.
1. [2]. Ataullakhanov R.I., Gintsburg A.L. Immunity and infection: dynamic opposition of living systems. // Pediatrics, No. 4, 2005, p. 47-61.
2. Asadova G.U. Cardiointerval diagnostics and treatment of chronic bronchopulmonary diseases in children. // Soglikni saklash tizimining birlamchi buginida bolalarga kursatilaotgan yordam sifatini yakhshilash. Republic of ilmiy anjumani materialari. Toshkent, 2003.S. 101-103.
3. Dzhubatova R.S., Umarova Z.S., Gulyamov R.O. and others. The value of the psychological status in the formation of a chronic bronchopulmonary process in children. // Mater. 13th National Congress on Respiratory Diseases: Abstracts of reports. Moscow-2003. with. 65.
4. Ibatova Sh.M., Mamatkulova F.Kh., Rakhmonov Yu.A., Shukurova D.B., Kodirova M.M. Assessment of the Effectiveness of Treatment of Rachit in Children by Gas-Liquid Chromatography. // International Journal of Current Research and Review, 2021, 13 (6), P. 64-66.
5. Ibatova Sh. M., Mamatkulova F. Kh., Ruzikulov N.Y. The Clinical Picture of Acute Obstructive Bronchitis in Children and the Rationale for Immunomodulatory Therapy. International Journal of Current Research and Review. Vol 12 Issue 17. September 2020. - P.152-155.
6. Sh. M. Ibatova, F. Kh. Mamatkulova, N. B. Abdukadirova, Yu. A. Rakhmonov, M. M. Kodirova. Risk Factors for Development of Broncho-Ostructive Syndrome in Children. International Journal of Current Research and Review. Vol 12. Issue 23 December 2020. -P. 3-6.
7. Ibatova Sh.M., Mamatkulova F.Kh., Rakhmonov Y.A., Shukurova D.B., Kodirova M.M. Assessment of the

Effectiveness of Treatment of Rachit in Children by Gas-Liquid Chromatography. International Journal of Current Research and Review. Vol 13, Issue 06, 20 March 2021. P.64-66.
8. Sh.M. Ibatova, F.Kh. Mamatkulova, D.S. Islamova. Efficiency of combined application of apricot oil and aevit as a regulator of lipase activity of blood serum in children with vitamin D-deficiency rickets. Journal of Critical Reviews. // ISSN- 2394-5125. VOL 7, ISSUE 11, 2020. P.1266-1274.
9. Ibatova Sh.M., Baratova R.Sh., Mamatkulova F.Kh., Ergashev A.Kh. State of immunity in chronic obstructive pulmonary disease in children. Asian Journal of Multidimensional Research (AJMR). Vol.10, Issue 3, March, 2021. P. 132-136.
10. Ibatova Sh. M., Abdurasulov F.P., Mamutova E.S. Some aspects of diagnostics of out-of-social pneumonia in children indications for hospitalization. EPRA International Journal of Research and Development (IJRD) Volume: 6 | Issue: 4 | April 2021. P. 242-244.
11. Ibatova Sh.M., Mamatkulova F.Kh., Mukhamadiev N.K. State of immunity in chronic obstructive pulmonary disease in children. Central Asian Journal of Medical and Natural Sciences Volume: 02 Issue: 05 | Sep-Oct 2021 ISSN: 2660-4159. P. 103-107.
12. Ibatova Sh.M., Muhamadiev N.Q. Efficiency of immunomodulating therapy in acute obstructive bronchitis in children. Central Asian Journal of Medical and Natural Sciences. Volume: 02 Issue: 02 | March-April 2021 ISSN: 2660-4159. P. 210-213.
13. Ibatova Sh.M., D.T. Rabbimova, E.S.Mamutova, N.B.Abdukadirova, M.M. Kadirova. Gas-chromatographic appraisal of aplication of apricot oil and aevit in complex therapy of vitamin D-deficiency rickets in children. International Scientific Journal Theoretical &Applied Science, 24.04.2019, Philadelphia, USA, P.333-336.
14. Ibatova Sh.M. Evaluation of the effectiveness of the use of apricot oil and aevit in the complex treatment of children with rickets // J. Bulletin of the Association of Physicians of Uzbekistan. - 2015. - No. 4. - P.50-53.
15. Ibatova Sh.M. Optimization of the treatment of rickets in children // J. Infection, immunity and pharmacology. - 2015. - No. 5. - S. 99-103.
16. Ibatova Sh.M. D.S. Islamova, Sh.O. Akhmedov. The use of cumin oil in the treatment of children with rickets // J. Problems of biology and medicine, Samarkand. - 2015. - No. 2 (83). - S. 50-52.
17. 18.Sh.M.Ibatova, F.Kh.Mamatkulova, N.B.Abdukadirova, Kh.M.Oblokulov, F.A. Achilov. The effectiveness of the use of apricot oil in children with rickets. // Scientific and practical journal "Questions of Science and Education", Moscow, 2019, No. 27 (76), -P.40-46.
18. Sh.M.Ibatova, F.Kh.Mamatkulova Gas chromatographic evaluation of the use of apricot oil and aevit in the complex therapy of vitamin D-deficient rickets in children. Scientific journal "New day in medicine". No. 2 (30/2) 2020. -P. 265-267.
19. 20. Ibatova Sh.M., F.Kh. Mamatkulova M.M. Kodirova. Evaluation of the effectiveness of treatment of rickets in childrenby gas-liquid chromatogramphy Asian Journal of Multidimensional Research Vol. 9, Issue 10, October, 2020. P. 44-47.
20. Ibatova Sh.M., Islamova D.S., Goyibova N.S. Studying the level of immunoglobulins in the blood serum of children in depending on feeding. eurasian journal of medical and natural sciences. 2023. P. 10-14.
21. Ibatova Sh.M., Mamatkulova F.Kh., Normakhmatov B.B. Giardiasis in children and its significance in the etiopathogenesis of diseases in children.

American Journal of Technology and Applied Sciences. 2023.P. 36-41.