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THE CHARACTERISTIC OF THE IMMUNE STATUS AT HIV-INFECTED CHILDREN WITH ACUTE RHINOSINUSITIS

Narzullaev N.U.
Bukhara State Medical Institute

ABSTRACT

The immune status has been studied at 35 HIV-infected of children with ARS. The control group of comparison consisted from 14 practically healthy faces. At a HIV-infected of patients with ARS has revealed deep infringements of the immune status, especially from the T-link of immunity and its subpopulations, and also frustration humoral an immunity link, suppression of proinflammatory cytokine IL-10 and increase proinflammatory IFN-γ. Under the influence of the spent treatment have not revealed certain changes from the immune status at patients. It is possible to ascertain only positive changes of maintenance IL-10 and parallel decrease IFN-γ in dynamics of treatment. In the main group there were 25 HIV-infected patients with ARS, and in the control group there were 14 practically healthy children of the same age who did not have a history of ARS and HIV. All 35 HIV-infected children were registered with the Bukhara Regional AIDS Center. Patients received antiretroviral therapy, antibacterial, anti-inflammatory and local therapy in a hospital setting.

***Key words**: The immune status, a HIV-infection, acute rhinosinusitis, cellular immunity, humoral immunity, an immunodeficiency, cytokines.*

ХАРАКТЕРИСТИКА ИММУННОГО СТАТУСА У ВИЧ-ИНФИЦИРОВАННЫХ ДЕТЕЙ С ОСТРЫМ РИНОСИНУСИТОМ

Нарзуллаев Н.У.
Бухарский государственный медицинский институт

АННОТАЦИЯ

Иммунный статус изучен у 35 ВИЧ-инфицированных детей с ОРС. Контрольную группу сравнения составили 14 практически здоровых лиц. У ВИЧ-инфицированных больных ОРС выявлены глубокие нарушения иммунного статуса, особенно со стороны Т-звена иммунитета и его субпопуляций, а также расстройства гуморального звена иммунитета, подавление провоспалительного цитокина ИЛ-10 и повышение противоспалительного ИФН- γ. Под влиянием проведенного лечения не выявили определенных

изменений со стороны иммунного статуса у больных. Можно констатировать только положительные изменения содержания ИЛ-10 и параллельное снижение ИФН-γ в динамике лечения. В основной группе было 25 ВИЧ-инфицированных с ОРС пациентов, а в ко-нтрольной - 14 практически здоровых детей аналогичного возраста, не имевших в анамнезе ОРС и ВИЧ. Все 35 ВИЧ-инфицированные дети состояли на учете в Бухарском областном СПИД-центре. Больные получали антиретровирусную терапию, антибактериальную, противовоспалительную и местную терапию в условиях стационара.

Ключевые слова: *иммунный статус, ВИЧ-инфекция, острый риносинусит, клеточный иммунитет, гуморальный иммунитет, иммунодефицит, цитокины.*

O'RS BILAN KASALLANGAN OIV INFEKTSIYALI BOLALARDA IMMUN STATUS TAVSIFI

Narzullaev N. U.
Buxoro davlat tibbiyot instituti

ANNOTATSIYA

Immunitet holati O'RS bilan kasallangan 35 nafar OIV infektsiyali bolalarda o'rganildi. Nazorat guruhini 14 nafar sog'lom bolalar tashkil etdi. OIV bilan kasallangan O'RS bilan kasallangan bemorlarda immunitetning chuqur buzilishlari, ayniqsa immunitetning T-bo'g'inlari va uning subpopulyatsiyalari, shuningdek, immunitetning gumoral bog'lanishining buzilishi, yallig'lanishga qarshi sitokinning bostirilishi aniqlangan. IL-10 va yallig'lanishga qarshi IFN-g ning ko'payishi kuzatildi. O'tkazilgan davolanishning ta'siri ostida bemorlarda immunitet holatida aniq o'zgarishlar aniqlanmadi. Biz faqat IL-10 tarkibidagi ijobiy o'zgarishlarni va davolash dinamikasida IFN-g ning parallel pasayishini aytishimiz mumkin. Asosiy guruhda OIV bilan kasallangan 25 nafar ARS bilan kasallangan bemorlar, nazorat guruhida esa xuddi shu yoshdagi 14 nafar amalda sog'lom, OIV va OIV bilan kasallangan bolalar bor edi. OIV infeksiyasiga chalingan 35 nafar bolaning barchasi Buxoro viloyati OITSga qarshi kurash markazida ro'yxatga olingan. Bemorlarga shifoxona sharoitida antiretrovirus terapiyasi, antibakterial, yallig'lanishga qarshi va mahalliy terapiya o'tkazildi.

Kalit so'zlar: *immunitet holati, OIV infektsiyasi, o'tkir rinosinusit, hujayra immuniteti, gumoral immunitet, immunitet tanqisligi, sitokinlar.*

INTRODUCTION

The problem of infection caused by the human immunodeficiency virus (HIV) has been studied in otorhinolaryngology in our country since the early 1990s. Identified and described diseases that are an indicator of acquired immunodeficiency syndrome (AIDS), studied the symptoms of lesions of the ear, throat and nose in HIV-infected and AIDS patients (1,3,5).

Due to a significant increase in the number of cases of HIV infection, the likelihood of contact of an otorhinolaryngologist with HIV-infected patients is increasing. With HIV infection, various manifestations of the disease often occur with damage to the upper respiratory tract. Otorhinolaryngologists, as well as other specialists, already have to take an active part in the diagnosis, treatment of HIV-infected persons, preventive work, which, of course, will require knowledge of the features of the pathology of the ear, throat and nose in HIV infection (AIDS) (2, 8.9).

The variety of clinical manifestations of HIV infection is due to the addition of opportunistic infections, among which fungal, bacterial and viral infections are of the greatest importance. The classic manifestation of HIV infection that an otorhinolaryngologist may encounter is the development of acute rhinosinusitis. Acute rhinosinusitis is one of the most common bacterial infections in children with a normal immune system, but the features of the course of these diseases in immunodeficiencies are poorly understood.Meanwhile, our own experience and the few data from clinical studies that are available today suggest that this disease, in acute, chronic and recurrent forms, is common in HIV-infected children.And although in most cases the etiology, symptoms and course of these diseases in HIV-infected children and in children with a normal immune system are the same, nevertheless, a prolonged, severe or unusual course of these infections, with frequent relapses, or the isolation of atypical pathogens (including pathogens of opportunistic infections) should alert the physician to possible HIV infection. This disease has long attracted the attention of otorhinolaryngologists and paediatricians, especially since observations and studies have appeared indicating an association of acute rhinosinusitis with HIV infection (6,7,10).

The aim of the study was to study the parameters of the immune system in HIV-infected children with acute rhinosinusitis.

MATERIAL AND METHODS

We investigated 35 children at the age from to 3 till 14 years of a HIV-infected with ARS, were on hospitalization in LOR-BRANCH of the Bukhara regional

children's versatile medical centre. Boys have made 56.6%, girls – 43.4%. Unilateral defeat of sine was observed at 57.8%, bilateral - at 42.2%. Except inflammation signs the general anxiety, a bad dream, refusal of a chest food, headaches was marked. Besides traditional inspection (the general analysis of blood, urine, bacteriological and bio-chemical researches) all patients have passed LOR-survey, under indications - sine sounding (26.5%), X-ray additional bosoms of a nose (9.6%). In the basic group there were 25 HIV-infected with ARS pa-tients, and in a control - almost healthy 14 children of similar age who did not have in anamnesis ARS and a HIV. All 25 HIV-infected children consisted on the account in the Bukhara regional AIDS-cen-tre. Patients received antiretroviral therapy, antibacterial, anti-inflammatory and local therapy in the conditions of a hospital.

The HIV diagnosis was based on revealing of specific antibodies in standard serological tests (ELISA, immune bloating in updating Western-bloat) and comparisons epidemiological and serological data.

Immunologic studies were carried out in conjuction with the the Institute of Immunology NA RUz (Tashkent). In researches included patients from a HIV-infection and ARS which parents have given the informed consent to participation in the given researches (work has been executed according to the Helsinki declaration and it is approved by ethical committee of Bukhara State Medical Institute).

Phenotyping lymphocyte carried out indirect by immune fluorescent method with the help monoclonal antibodies to CDs-receptors «Sorbent Ltd» (Russia). Defined T-lymphocytes (total set - CD3); T-helpers (subset of Th - CD4); T-suppressors (subset of Ts - CD8); B-lymphocytes (subset CD19).

Calculated an immunoregulatory index (IRI) – the ratio of CD4/CD8. Concentration serum antibodies (Ig) A, M and G defined a method of radial immune diffusion[7]. Level cytokines (IFN-γ, IL-10) in whey of peripheral blood was studied a method of the immune enzyme analysis with use of test sys-tems by firms "Vectors-best" (Russia). Parameters of the immune status studied twice: before and 1 month after treatment.

The obtained data was exposed to statistical processing with use of computer program Micro-soft of Excel 2003 on LG-Pentium IV. Significance of differences when comparing the mean values were determined by Student´s **t** test. Data are presented as of M ± m. Differences were considered significant at $P<0.05$.

RESULTS OF RESEARCH AND THEIR DISCUSSION

The retrospective analysis of studying of the immune status at a HIV-infected of children with ARS has shown that in terms before carrying out before treatment at

them essential infringements have been revealed from their immune system (tab. 1). At a HIV-infected with ARS patients observed 0.7-fold fall of absolute value of leukocytes and the relative contence lymphocyte, double decrease in the absolute values of lymphocyte. Such decrease was reflected in statistically significant decrease from 2 to 3 times of absolute values of the total pool T (CD3) - and B (CD19)-lymphocyte (tab. 1).

At a HIV-infected patients with ARS children showed profound suppression T-cell immunity in their relative expression, namely, 0.6-fold reduction in T-cells with the phenotype (CD3), even more si-gnificant suppression T-share helpers cells - Th (CD4) – up to 13.8 ± 2.3% (in the control group 34.2 ± 1.6%; $P<0.001$), while the content of subset of T-cells - T (CD8)-cytotoxic exceeded the background va-lues in the control group moderate ($P>0.05$).

In this connection in the given group there is an inversion an immune regulatory index (IRI) – the ratio of CD4/CD8, - that leads to serious changes in immune system of patients with HIV-infec-tion, combined with the ARS. Thus, we find out a disbalance of T-cell subset with a decrease in the proportion of helpers Th(CD4) and increase suppression parts - Ts(CD8) (tab. 1). Reduction IRI regis-tered by us at HIV-infected with ARS children testifies to functional insufficiency of cages with a phe-notype of Ts(CD8), and it is a sign of the profound immunodeficiency which has developed at patients. At a HIV-infected of patients with ARS have revealed small activation of subset of T-killers - Tk (CD16) that, possibly, is also pathognomonic at this pathology.

In respect of B-cell component of the immune system can be said that moderate decrease occurred, which was statistically is possible to tell that there was a moderate decrease that statistically confirmed ($P>0.05$). Decrease B(CD19) lymphocytes was reflected in the spectrum of serum immuno-globulin (SI) content of two classes - IgA and IgG, and quantity IgM, on the contrary, increased (tab. 1).

The data obtained by us testifies to profound infringements in the functioning of the immune sy-stem in children of patients with a HIV-infection and ARS, which were reflected a spectrum cellular and humoral immunity factors. These disorders appear to be quite possible as a fact that plays an im-portant in the pathogenesis of this mixed-pathology in children. The decrease of the relative quanti-tative propeties of Th(CD4) - this aggravating factor, and an unfavorable forecast criterion.

The spent treatment did not lead to appreciable changes of parameters of immune system at a HIV-infected of children with ARS. We observed a tendency in

moderate increase of separate links of cellular immunity and humoral immunity, however restoration of key parameters of the immune status (tab. 1). Besides, at patients with chronic processes saved pressure of the humoral component of sys-tem of immunity remained at P>0.05. In a HIV-infected of patients with ARS have found out weak increase T(CD3) and B(CD19) in their relative and absolute values, and also moderate increase of production of Tk (CD16), Ts (CD8), the concentration of IgA (tab. 1).

Spectrum studying cytokines at a HIV-infected of children with ARS has shown that at them presence of significant differences between values of the basic group with control group was marked. So, for example, if at healthy children level IFN-γ made 23.70 ± 5.38 pg/ml, at a HIV-infected of children with ARS the similar parameter was in 3/5 times above and there was at level 82.84 ± 21.17 g/ml (tab. 2). So, high level IFN-γ at a HIV-infected of children with ARS testified to expressiveness of degree of inflammatory reaction.

It is known that as a source IFN-γ serve activated T-lymphocytes and natural killers. Among T-lymphocytes producers IFN-γ are both the cytotoxic Ts (CD8), and Th (CD4) cells, however at a differ-rentiation of the last on Th1 and Th2 ability to develop IFN-γ keep only Th1-cells. The major function IFN-γ is its participation in medium interrelations between lymphocytes and macrophages, and also in regulation of a parity cellular and humoral components of the immune response. Being the basic pro-

duct Th1-клеток, IFN-γ reduces secretor activity Th2-cells. Thus, IFN-γ enhances the development of cellular immunity and suppresses displays humoral immunity. Hence, IFN-γ plays an important role in immune regulation, being key by the cytokine cellular immune response and inhibitor of the humoral

immune response [8].

Table 1. Parameters of immune system at a HIV-infected of children with ARS in dynamics of treatment.

Indicator	**Healthy** (n=14)	**Patients** (n=25)
Leukocytes, num./mklt	6123 ± 162	4251 ± 321***
		4437± 234***
Lymphocytes, %	29.6 ± 1.7	21.4 ± 2.15**
		22.7 ± 2.4*
Lymphocytes, abs.	1812.4 ± 35.7	931.5 ± 97.2***
		1003.6 ± 47.5***

T(CD3), %	58.3 ± 2.5	38.4 ± 3.2***
		41.2 ± 2.7***
T(CD3), abs.	1058.2 ± 72.2	362.5 ± 43.6***
		425 ± 51,4***
Th(CD4), %	34.4 ± 1.6	13.8 ± 2.3***
		12.4 ± 2.7***
Ts(CD8), %	22.7 ± 1.2	24.2 ± 2.8
		26.5 ± 3.1
IRI (CD4/CD 8)	1.5 ± 0.14	0.58 ± 0.31**
		0.49 ± 0,36**
Tk(CD16), %	15.4 ± 0.9	16,2 ± 2,5
		18,4 ± 3,2
B(CD19), %	24.3 ± 1.22	19,62 ± 4,4
		22.5 ± 2.6
CD19, abs.	351.6 ± 29.4	182.1 ± 20.5***
		228.7 ± 34.9**
IgA, mg%	129.2 ± 10.8	84.4 ± 7.8**
		101.9 ± 13.6
IgM, mg%	86.7 ± 8.9	140.4 ± 13.1***
		136.3 ± 16.5**
IgG, mg%	1047.3 ± 33.4	888.7 ± 42.7**
		761.4 ± 54.6***
The note: in numerator the data before treatment, in a denominator - after treatment; * - P <0.05; ** - P <0.01; *** - P <0.001 - in comparison with control group.		

Table 2. The maintenance pro- and anti-inflammatory cytokines at HIV-infected of children in a combination with ARS in dynamics of treatment.

Indicator	Control group	The basic group
IFN-γ, pg/ml	23.70 ± 5,38	82.84 ± 21.17**
		21.93 ± 7.42
IL-10, pg/ml	10.95 ± 3.63	86.08 ± 19.43***
		52.04 ± 12.06**

The note: in numerator the data before treatment, in a denominator - after treatment;
* - P <0.05; ** - P <0.01; *** - P <0.001 - in comparison with control group.

Level IL-10 in group at a HIV-infected of children with ARS approximately in 8 times higher than those values of the control group. It is known that IL-10 it is described as the factor stimulating B-lymphocytes as it causes proliferation B-cells. The main producers IL-10 are Th2 cells. IL-10 inhibits functions of macrophages and secretion by them IL-1, FNO and IL-6, having thus anti-inflammatory an effect. IL-10 causes proliferation and a differentiation B - and T-lymphocytes, influences development hematopoietic cells, on macrophages, natural killers, basophiles, being the functional antagonist cyto-kines, produced Th1 cells. IL-10 promotes development of allergic reactions, possesses the expressed anti-inflammatory action [8].

The comparative analysis has shown that the parity IFN-γ/IL-10 (proinflammatory/anti-inflammatory cytokines or Th1/Th2) at healthy children equaled 2.2. In the presence of the expressed inflammatory process, that is at children of the basic group, this indicator made 0.96. The expressed disbalance in functioning of the core regulator cytokines which was expressed by acute lifting of level anti-inflammatory cytokines and suppression proinflammatory cytokines, acute inflammatory condi-tions being the basic regulators is revealed.

Thus, the HIV-infected of children with ARS have an expressed stimulation of production both proinflammatory, and anti-inflammatory cytokines. Such processes can as a necessary condition for protection against the infectious agent and system damaging action of high concentration proinflam-matory cytokines [8].

After treatment carrying out in group of a HIV-infected of children with ARS level IFN-γ has come nearer to control values, and level IL-10 in dynamics of treatment if decreased, but nevertheless remained at high level, in 5.5 exceeding those parameters at children of control group.

The parity IFN-γ/IL-10 in the basic group tended to even bigger to decrease, making 0.42.

CONCLUSION

Thus, at a HIV-infected of children with ARS deep deficiency of most of the parameters of the immune status is observed. One of the major disorders of the immune status is a significant suppres-sion of Th (CD4)-lymphocytes and inversion of the IRI with an increase in functional activity of Ts (CD8)-lymphocytes,

which is unfavorable clinical criteria. The given patients did not have positive dynamics of changes of the immune status after treatment carrying out. Under the influence of treatment there was a suppression proinflammatory of cytokine IFN-γ. However, it should highlight that the dete-cted change in the level of IL-10 and a violation of the proportion of pro- and anti-inflammatory cyto-kines indicates the presence of preexistingimmune deficiency, which, apparently, and was manifested in the form of complications associated with HIVinfection.

REFERENCES

1. Ikramova F.S., Radjabov R.R. Improving tactics of treatment of allergic rhinitis with chronic diffus diseases// Eurasian journal of academic research Volume 1, Issue 1 April 2021. – P. 760-767.
2. Ikramova F.S., Erkinov N.N. Evaluation of the effect of hygienic isotonic nose in pregnant women on early active rhinometry indicators //Eurasian journal of academic research Volume 1, Issue 1 April 2021. –P. 668-673.
3. Nurov U.I., Ikramova F.S. Features Of Non-Specific Protection Factors And Cytokine Status In Inflammatory Diseases Of The Paranasal Sinuses In Twin Children// The american journal of medical sciences and pharmaceutical research Volume 3 Issue 02, 2021. –P. 2689-1026
4. Nurov U.I., Ikramova F.S., Alimova Sh.A. Functional status of immune status in inflammatory diseases of the paranasal sinuses in twin children// Academic research in educational sciences volume 2 | issue 5 | 2021 ISSN: 2181-1385 Scientific Journal Impact Factor (SJIF) 2021: 5.723, pp 238-246.
5. Narzullaev .N.U. The characteristic of the immune status at hiv- infected children with acute rhinosinusitis . International scientific and practical conference. ADTI. 2019.pp.223-231.
6. Narzullaev N.U. Fregvency of occurrence of the exudative average otitis at the HIV-infected children. International scientific and practical conference. ADTI. 2019. pp.232-240
7. Narzullaev N.U. Clinic-immunological features the current of the chronic tonsillitis at a HIV-infected children depending on infection ways. //International scientific review of the problems and prospects of modern science and aducation. Boston.USA. 2018. P.- 50-52.
8. Narzullaev N.U. FarGALS efficiency in complex treatment of HIV-infected children with acute purulent sinusitis//European Science Review. - Austria, 2017. - No.1-2. -P.86-88.

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ASI Factor = 1.7

9. Narzullaev, N. U. (2012). The Incidence of Exudative Otitis Media in HIV Infected Children. *International Journal of Biomedicine*, *2*(3), 211-213.
10. Narzullaev, N. U., Suleymanov, S., Ismailova, A., & Sabitova, R. (2013). Immune Status of HIV-positive Children with Acute Rhinosinusitis. *International Journal of Public Health Science (IJPHS) USA*, *2*(3), 83-88.