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FEATURES OF FREQUENTLY ILL CHILDREN IN PEDIATRICS

Kodirov Khusan Solievich
Senior teacher of the "Pediatrics" department for the medical faculty of ASMI

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Abstract:
In the morbidity structure of frequently ill children (FIC), repeated upper respiratory tract infections (URI) predominate; 10–15% of FRIs have lower respiratory tract infections (LRTI), and, as a rule, this category of children is not susceptible to infections in other body systems: gastrointestinal tract, central nervous system, urogenital tract or skin.

Keywords: Illness, children, treatment, method, FIC.

INTRODUCTION

In infancy and early childhood, the child's immune system encounters many antigens for the first time, responds with immune reactions, and acquires immunological memory. Young children are exposed to many pathogenic microorganisms and are therefore most vulnerable to infection. But if the gastrointestinal and urogenital tracts, skin, and even more so the nervous system are the most protected, especially in relation to viral infection, then this does not apply to the respiratory system of the body [1].

MATERIALS AND METHODS

It is known that the formation of the respiratory organs ends on average before the age of 7, and then only their size increases. All airways (AP) in children are significantly smaller in size and have a narrower lumen than in adults. The mucous membrane is thinner, more delicate, and easily damaged. The glands are underdeveloped, the production of IgA and surfactant is insignificant. The submucosal layer is loose and contains a small amount of elastic and connective tissue elements, many of which are vascularized. The cartilaginous frame of the DP is soft and pliable. This contributes to a decrease in the barrier function of the mucous membrane, easier penetration of infectious and atopic agents into the bloodstream, and the emergence of preconditions for narrowing of the DP due to edema, which can lead to repeated viral infections of the DP (IDV) [2].

RESULTS AND DISCUSSION

In this regard, it can be considered normal for a child to grow up if the number of episodes of IDP does not exceed 6–8 times a year, especially if the child attends a nursery, kindergarten or school, or if there are older brothers or sisters. It should be remembered that viral UTI in 60% of cases is complicated by a bacterial infection, at least if it lasts more than 7-10 days. Children with repeated IDPs are a group of close observation; they require a thorough differential analysis of the existing clinical symptoms, taking into account an allergic history, the results of additional immunological and instrumental examinations, since repeated IDPs may be the first manifestations of bronchial asthma, and repeated pneumonia may indicate more severe pathology (primary immunodeficiency or abnormal development of the lungs).

According to the literature, changes in the immune response in frequently ill children (FIC) are numerous, but they do not indicate immunodeficiency, but only the characteristics of the immune response to infection. FIC have an immune system characterized by some immaturity and, accordingly, its normal functioning is altered, especially under the influence of external circumstances - frequently recurring viral infections, which leads to dysfunction of the immune system [4]. The secondary post-infectious nature of these changes is confirmed by the fact that after the child stops getting sick with RTIs frequently, these immunity disorders disappear. It should be emphasized that the combination of nonspecific changes in immune reactions and viral infection can lead to quite profound virus-induced immune dysfunction, which contributes to the recurrence of respiratory infections [3].

So what immune dysfunctions have been described in FIC during the period of clinical well-being, in the absence of acute respiratory infection?

62% of them had a reduced number of CD4+, CD8+, CD19+ and NK cells. The most common (from 23 to 40%) are combined changes in the T- and B-link systems of immunity; the content of pro-inflammatory interleukins (IL2, IL4) is significantly increased, incl. interleukins involved in the chronicization of inflammatory processes (IL6, IL8), the production of IL12 and the content of interferon (IFN), especially IFN (in 40% FIC), are reduced, while a combined decrease in alpha and gamma types of IFN was noted in 16 % of children. A decrease in the production of cytokines by lymphocytes (IL4, IL10, IFN, IL2), a decrease in the amount of IgM, IgA, IgG subclasses, mannose-binding

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lectin and the removal of apoptotic neutrophils by alveolar macrophages was shown, pathological phagocytosis was noted, and neutrophil chemotaxis was reduced.

Thus, immune dysfunctions in FIC concern all parts of immunity, both cellular and humoral, IFN production and phagocytosis. At the same time, at a certain stage, the induced production of pro-inflammatory cytokines becomes insufficient, which indicates the depletion of the reserve capabilities of the child's immune system. The immune system is characterized by extreme tension in immune response processes, which is the result of a long and massive antigenic effect on the body.

FICs pose a major challenge to pediatricians from both therapeutic and preventive perspectives. Interest in the preventive treatment of FIC has increased significantly in recent years. Such treatment should help reduce the incidence of IDPs. The latest trends in the prevention of common diseases of the respiratory system in children of early and preschool age are based on the use of methods of stimulating immunity.

Active immunostimulating therapy (IST) includes specific IST (this is vaccination, in this case against influenza and other viral infections) and nonspecific IST, which is an antigen-independent activation of the immune system aimed at strengthening "general" immunity. These include cytokines (IFN, colony-stimulating factors, IL1 and IL2) and non-cytokine adjuvants (immunomodulators of microbial origin, cytokine inducers, thymic peptides and thymomimetics, chemically synthesized immunomodulators) [5].

A striking example of cytokines used to stimulate the immune system is Viferon® – a domestic preparation of recombinant interferon α-2b with highly active antioxidants tocopherol acetate and ascorbic acid. Dosage forms of the drug Viferon® - rectal suppositories (suppositories), gel and ointment provide a simple, safe and painless method of its administration, which is especially important in pediatrics. Viferon® protects cells from damage, activates the immune system, and has antioxidant activity. Randomized studies have revealed a protective effect of viferon therapy in suppositories on the incidence of subsequent acute respiratory viral infections [2]. Viferon prophylaxis in suppositories should be carried out by FIC according to a modified scheme, which involves higher single doses of the drug at the beginning, followed by a dose reduction with increasing duration of use. Thus, the regimen for using the drug Viferon® rectal suppositories is as follows:

• children aged 1 month to 3 years, 500,000 IU
2 times a day for 5 days, then 150,000 IU 2 times a day for 5 days;
• children aged 3 to 7 years, 500,000 IU
2 times a day for 5 days, then 500,000 IU 1 time a day in the morning and 150,000 IU 1 time a day in the evening for 5 days;
• children aged 7 to 18 years, 1,000,000 IU
• 1 time a day in the morning and 500,000 IU 1 time a day in the evening for 5 days, then 500,000 IU 2 times a day for 5 days.

CONCLUSION

Preventive treatment of FIC should include immunomodulatory therapy, since the immune system of a frequently ill child is characterized by extreme tension in the immune response processes. Currently, there are several possibilities for immunomodulatory therapy with drugs such as Viferon®, Ribomunil (especially in combination with influenza vaccination) and Imunorix. Many clinical and experimental studies have confirmed their effectiveness and pharmacological safety.

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