

# LOOKING FOR WAYS OF PREVENTION OF ACUTE RESPIRATORY DISEASES IN CHILDREN - INHABITANTS OF A MAJOR INDUSTRIAL CITY

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**Summary.** *The study of respiratory morbidity, lipid peroxidation indices, endotoxemia, immunity in children of early age - inhabitants of a major industrial city associated with the background of application of Flavozid was carried out. It has been established that the preventive application of Flavozid allows improving the immunity indices and reducing the incidence of acute respiratory diseases in children.*

**Key words:** *children, industrial city, acute respiratory diseases, Flavozid.*

## Introduction

Children living in environmentally unfavorable conditions have an increased incidence, in the structure of which respiratory tract diseases predominate at an early age [1, 11]. One of the causes of increased respiratory morbidity is the adverse effect of environmental, socio-economic factors on the immune system [6-9]. In previous studies, we found that inhabitants of a large industrial city have more frequent respiratory diseases [2] and are characterized of changes in the number of T-lymphocytes and their subpopulations, the activity of phagocytosis [5]. For solving the problem of frequent respiratory diseases, the preventive direction is of paramount importance. The most common cause of development of respiratory diseases are viruses. In addition, people with chronic persistent viral infection are more likely to have respiratory diseases, and therefore the implementation of preventive measures using antiviral drugs is justified. In recent years, the attention of researchers has attracted a new domestic antiviral and immunomodulating phytopharmaceutical product Flavozid.

**The goal** of the study was to evaluate the effectiveness of the prevention of acute respiratory infections in children living in a major industrial center using Flavozid.

## Material and methods of the study

65 children of middle and senior kindergarten groups were under observation. 30 children, whose names began with the letters A to K (the first and the seventeenth Russian alphabet letters respectively), were provided 2-week courses of preventive treatment using Flavozid (experimental group) during October, December and February. The drug was prescribed from the 1st to the 3rd day, 3 ml 2 times a day, from the 4th day - 4 ml 2 times a day. 35 children, whose names began with the letters Л-О (*the eighteenth-the thirty third Russian alphabet letters respectively*), were not provided any treatment (control group). The children were examined in October, before the treatment, and in April. In addition to general clinical parameters, the content of thiobarbituric acid of active products was studied, which characterizes the lipid peroxidation (LPO) system, the average molecules that characterize the manifestations of endotoxemia, secretory immunoglobulin A in saliva, the level of IFN- $\alpha$  and IFN- $\gamma$  interferons in serum. The concentration of thiobarbituric acid of the active products was determined by E.N. Korobeynikova [4], medium molecules 1 and 2 - according to S.S. Kireev et al. [3], secretory immunoglobulin A - according to G.Mancini et al. [10], interferons with the help of immunoenzyme test systems.

## The results of the study and their discussion

Children of the experimental and control groups had approximately the same values of the studied parameters before the study, which allowed them to be grouped together. In the control group, the level of thiobarbituric acid of the active products significantly increased during the study and the concentration of the average molecules increased inadequately, which indicates activation of lipid peroxidation processes and an increase in the level of endotoxemia (Table). Probably, these changes during the winter period

were due to seasonal hypovitaminosis. The level of interferons in the autumn and spring in the control group did not differ on average.

Table 1

**The dynamics of the studied parameters in children during the implementation of preventive measures**

Parameters	In autumn	In spring		p
		Experimental group	Control group	
Thiobarbituric acid active products, nmol/L	10.5±0.5	10.8±0.5	12.6±0.6*	xxx
Average molecules 1, c.u.	0.33±0.05	0.30±0.04	0.38±0.04	
Average molecules 2, c.u.	0.13±0.03	0.12±0.03	0.14±0.03	
Secretory IgA, mg/ml	0.46±0.06	0.62±0.06	0.43±0.06	xxx
IFN-a, pg/ml	19.6±1.5	24.7±1.6*	18.4±1.6	xxx
IFN-y, pg/ml	12.6±1.1	16.3±1.2*	11.3±1.2	xxx

Note. \* Significance of differences in comparison with the autumn examination ( $p < 0.05$ ); xxx - the reliability of the differences between the corresponding parameters of the experimental and control groups ( $p < 0.05$ )

In children, who were provided preventive courses of Flavozid, the level of secretory IgA decreased somewhat, which is a marker of local immunity of the mucous membranes. When analyzing the results of the study of children in the spring, significant differences were found between the concentration of thiobarbituric acid of active products, secretory IgA, interferon in children of the experimental and control groups. This suggests that the use of Flavozid in winter can avoid the activation of LPO and worsening of local immunity. It is important to increase the level of interferons in the group of children who were provided Flavozid, in theory this allows improving antiviral protection. We have not established significant differences in the content of medium molecules between the children of the experimental and control groups, but it is necessary to pay attention to the decrease in the manifestations of endotoxemia in children who were provided Flavozid. This is especially important in conditions of technogenic strain of major industrial cities.

We also analyzed the children's attendance of childcare centers and their morbidity. Due to the disease, the children of the control group missed 13.5% of the days, and the experimental group - 9.9%, which is one third less. Thus, the preventive use of Flavozid enables to significantly reduce the incidence of acute respiratory infections in preschool children. This decrease is ensured by the antioxidant properties of the drug, its ability to increase the level of secretory IgA and interferons, which are reduced in children living in environmentally unfavorable conditions. One of the reasons for reducing the incidence of the disease in children is probably the antiviral effect of Flavozid and, thus, improvement in overall immunity, changes in the viral and bacterial flora of the respiratory tract of children.

Certainly, the use of Flavozid did not completely prevent the development of ARI in the children of a major industrial center but their significant reduction allows us to recommend the use of the drug in complex recreational activities.

## Conclusions

The preventive application of the complex phytopharmaceutical product Flavozid makes it possible to reduce the incidence of acute respiratory diseases in children of a major industrial city with an unfavorable ecological situation due to antioxidant, immunomodulatory and antiviral actions.

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