Arvi In Children Born With Congenital Heart Defects

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ABSTRACT

In the pre-epidemic period of ARI, 31 children aged 3–12 years with congenital heart defects (the main group) were assessed for the effectiveness of a preventive program with recombinant liposomal interferon alpha-2: 250,000 units once a day, 2 times a week for 1 month (technique I). Due to insufficient effectiveness, we subsequently continued prophylaxis using method II: 250,000 units 2 times a day for 3 days, then 250,000 units once a day, 2 times a week for 1 month.

Keywords: children, method, congenital heart defects, local immunity

INTRODUCTION

In the structure of the general morbidity of children and adults in Uzbekistan, the leading place is occupied by diseases of the respiratory system [9], while the proportion of acute respiratory viral infections (ARVI), including influenza, reaches 95% [1]. The incidence of ARVI in children is 1.5–3 times higher than in adults [2]. A special contingent in this case are children with congenital heart defects (CHD), in whom acute respiratory infections (ARI) are observed more often and are more severe, and the infectious process is often characterized by a protracted course, accompanied by bacterial complications, and can cause death. This is a consequence of hemodynamic disturbances with an increase in blood flow in the pulmonary circulation and/or characteristics of the immune system [3].

MATERIALS AND METHODS

Under our supervision during 2021–2023. There were 51 children aged from 3 to 12 years. The main group included 31 patients with congenital heart disease (16 boys and 15 girls), who underwent cardiac surgical correction from 2 to 10 years ago. In all children, the frequency of ARI ranged from 6 to 12 times over the past year. The comparison group consisted of 20 healthy peers (10 boys and 10 girls).

The examination complex included the collection and analysis of complaints, anamnestic data, taking into account the number of ARI; severity of the current; presence of complications. Objective status was assessed at 4 visits: before the start (1st visit), on the 30th (2nd visit), 120th (3rd visit), 180th (4th visit) day from the start preventive effects. At the 2nd and 4th visits, monitoring of adverse events was carried out. At the 4th visit, satisfaction with the results of treatment was assessed using the integral patient satisfaction scale with the results of preventive treatment (IMPSS): "completely satisfied", "satisfied", "neutral", "not satisfied", "extremely dissatisfied".

RESULTS AND DISCUSSION

The work was completed in two stages. At the first stage, in the pre-epidemic period, RLα2αI was prescribed according to the instructions for the drug at a dose of 250,000 units once a day, 2 times a week for 1 month (method I). At the second stage, RLα2bI was prescribed for the purpose of emergency prevention of ARI (contact with a patient with ARI, increased incidence of ARI in children) 250,000 units 2

times a day for 3 days (instructions for the drug for the treatment of ARI), then 250,000 units once a day, 2 times a week for 1 month (according to the prevention instructions) - method II. Immediately before use, 30 minutes before meals, 1–2 ml of chilled boiled water was added to the bottle with lyophilized powder and shaken for 1–5 minutes until a homogeneous suspension was formed.

The criteria for the effectiveness of the preventive intervention were: dynamics of the frequency and duration of ARI, the presence of bacterial complications over the next 6 months. In children who received preventive treatment using Method II, changes in the content of local body defense factors—lysozyme, lactoferrin, and secretory immunoglobulin A (sIgA)—in the oropharyngeal secretion before and on the 30th day of preventive treatment were additionally studied. In the comparison group (healthy children) - at the initial examination.

The concentration of lysozyme in saliva was measured by the nephelometric method with a suspension of Micrococcus lysodekticus according to R. Parry, modified by Kh.Ya. Grant et al.

Lactoferrin is an iron-binding glycoprotein (molecular weight 80,000 Da), a factor of nonspecific defense of the body, a marker of acute-phase reactions of the inflammatory process. Lactoferrin is part of the secretions of the salivary, lacrimal, mammary glands, secretions of the digestive, respiratory and genitourinary tracts. It has bactericidal and bacteriostatic activity due to the ability to bind iron ions necessary for the life of a microbial cell, the ability to attach to the cell membrane, blocking its transport functions, and the ability to change the functional properties of neutrophils [3].

The dynamics of the level of lysozyme, lactoferrin, secretory immunoglobulin A in the oropharyngeal fluid under the influence of method II is shown in Table. 1-2. When assessing the state of local immunity, it was found that initially in children with a history of surgical correction of congenital heart disease and recurrent acute respiratory infections, in comparison with healthy peers, there is a decrease in the level of lysozyme in the oropharyngeal secretion (3.5 times, P1: 3 < 0.001)

Table 1. Dynamics of lysozyme content in the oropharyngeal fluid against the background of the preventive program according to method II

Lysozyme (g/l)	Main group (n = 31)		Comparison group (n = 20)	P
	Before the study begins	On the 30th day	Before the study begins	
	1	2	3	
M ± m	8,05 ± 0,77	21,75 ± 0,77	28,28 ± 0,87	$P_{1:2} < 0,001$ $P_{1:3} < 0,001$ $P_{2:3} < 0,001$
G	4,30	4,32	3,93	
Min	1,50	8,80	21,00	
Max	16,50	28,20	34,00	
CI, left border, 95%	6,47	20,16	26,44	
CI, right border, 95%	9,62	23,33	30,12	

Table 2. Dynamics of lactoferrin content in the oropharyngeal fluid against the background of the preventive program according to method II

Lactoferrin (ng/ml)	Main group (n = 31)		Comparison group (n = 20)	P
	Before the study begins	Before the study begins	До начала исследовани	

			я	
	1	2	3	
M ± m	4888,19 ± 354,72	7258,06 ± 362,75	8465,20 ± 327,61	
G	1974,97	2019,70	1465,11	$P_{1:2} < 0,001$
Min	1004,00	3008,00	5690,00	$P_{1:3} < 0,001$
Max	9650,00	10072,00	10960,00	
CI, left border, 95%	4163,77	6517,23	7779,51	$P_{2:3} < 0,001$
CI, right border, 95%	5612,62	7998,89	9150,89	

During the study using Method II, the RLI drug was well tolerated and no side effects were recorded. Parents of 96.78% of patients positively assessed the results of preventive treatment using Method II (IMPSS data): “completely satisfied” - 6 (19.35%); “satisfied” - 19 (61.29%); “I’m neutral” - 5 (16.13%); “not satisfied” - 1 (3.22%).

CONCLUSION

In children with congenital heart disease, a decrease in the level of lysozyme, lactoferrin and secretory immunoglobulin A was detected in the oropharyngeal secretion, which indicates a lack of local immunity and an increased risk of ARI.

The use of the drug RLI for the prevention of ARI in children from 3 to 12 years old with congenital heart disease, 250,000 units 2 times a day for 3 days, then 250,000 units 1 time per day 2 times a week for 1 month, revealed a high efficiency and safety. A preventive program using the specified method can be carried out in the pre-epidemic and epidemic periods, as well as before the child begins attending a children’s group.

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