



GASTROINTESTINAL TRACT IN CHILDREN WITH ALLERGIC RHINITIS

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ABSTRACT

Since the initial days of life (and before than intrauterine) intestine affects formation of immune response. So, development of protective mechanisms and their activity in the future depend on the stability and balance of micro flora settling on sterile surface of intestinal mucous membrane of a new-born baby [1,3,6]. Thus, prerequisites of disorders in the immune system appear in early childhood. Immature organism of a young child has to adjust to new, sometimes hostile conditions

Since the initial days of life (and before than intrauterine) intestine affects formation of immune response. So, development of protective mechanisms and their activity in the future depend on the stability and balance of micro flora settling on sterile surface of intestinal mucous membrane of a new-born baby [1,3,6]. Thus, prerequisites of disorders in the immune system appear in early childhood. Immature organism of a young child has to adjust to new, sometimes hostile conditions. After birth protection received from mother (antibodies, or special protein complexes transmitted through placenta and breast milk) helps to overcome certain risks (infection). However, it is valid only for a few months; after that a baby needs his own immunity, even imperfect one. Gastrointestinal tract is a physiological barrier for antigens, in other words alien substances. Every day it catches hundreds and thousands of pathogens such as viruses, bacteria, allergens, parasites, and food proteins [2,4].

The objective: to study peculiarities in intestinal micro flora in children with allergic rhinitis (AR).

Data and research methods. Forty children, diagnosed with AR at the moment of the first application, were enrolled in the study. Among them 51.7% of the patients had combined allergic lesion of nose and gastrointestinal tract.

Twenty-one children applied with the initial manifestations of AR observed at the age of 3-6 years old (average age 5.09 years old) and nineteen children within the period from 6 to 9 years old (average age 7.8 years old). Maximal number of primary applications due to clinical symptoms of AR was registered among the children under 3 (38.6 %), less among the children of 3-6 years old (36.3 %), and the least from 6 to 9 years old (25.1 %). Comparison group included 20 children from 3 to 9 years old with no hereditary atopic pathologies (average age 7.9 years old).

Research methods included definition of qualitative and quantitative composition of intestinal micro flora in children, dynamic definition of the number of eosinophiles by means of immersion microscopy of stained smears in compliance with Romanovsky-Gimza's method

and definition of total immunoglobulin E (IgE) using enzyme immunoassay according to the recommendations of the manufacturer. Morbidity rates with somatic and infectious origin were assessed with the help of interviewing parent and analysis of children's medical cards (history of physical development № 112). Statistical processing of the result was performed using STATISTICA for WINDOWS 6.1 software.

Results and discussion. All the children with AR had hereditary predisposition to allergy, most often inherited from mothers (67.6%). Among the relatives of the children in both groups we registered high prevalence rates of intestinal pathologies (27.5%) and helminth-protozoa infections (8.9%). Allergic and somatic diseases in the majority of the mothers conditioned the high rates of morbidity within pregnancy. Mother of children with AR had chronic tonsillitis more often, than those from the comparison group (29.2 % versus 7.5 %, $p=0.011$), and four of them (6.7 %) had exacerbation during pregnancy. Pregnancy with chronic pyelonephritis was registered in 18 women out of 40 from the basic group (45 %) and 6 out of 20 in the comparison group (30.0 %), exacerbation was registered only among the women of the basic group ($n=12$, $p=0.017$).

Health status of all children at birth was considered to be satisfactory. We revealed no statistically significant differences in mean anthropometric parameters. The work with the mothers of the children with AR started from the maximal preservation of lactation. Symptoms of allergic rhinitis in 78.3% of the children under 5 were observed during the whole year.

Total immunoglobulin E was tested at the primary application and by the end of the second year of follow-up. First test of IgE showed average 465.50 ± 121.71 IU, while the next showed 99.14 ± 23.6 IU ($p=0.001$), which testifies decrease in the allergic process intensity ($p=0.001$). Number of eosinophiles in the children of the basic group reached 4.9 ± 0.21 %, and in the comparison group 1.4 ± 0.2 % ($p=0.001$). Statistically significant prevalence of eosinophiles in children of the basic group was preserved until 6 months. Later there was no notable difference, while the level of eosinophiles was higher in the comparison group due to greater prevalence of worm infestation.

In our study children with AR were randomized to two groups. In the basic group children received basic therapy for the main disease with addition of probiotic, while in the control group children received only basic therapy. That agent was chosen as it is the only probiotic effecting all parts of gastrointestinal system, including large intestine.

Children were examined again at the end of the first hospitalization and at the next hospitalization in 7-9 months. The basic group included 17 children with AR and the control group included 24 children. Performed therapy caused decrease in the expression of gastrointestinal complaints (Table 1). In the basic group we observed a positive dynamics in all studied symptoms of digestion.

Table 1.

Dynamics of gastrointestinal symptoms in the follow-up of the children before the therapy

Symptoms	Basic group n=17		Control group n=24	
		%		%
	First examination			
Stomachache	17	100	11	46.0
Discomfort in abdomen	17	100	21	87.5
Nausea	14	82.3	7	29.1
Vomiting	10	58.9	4	16.7
Heartburn	6	35.2	3	12.5
Diarrhea	8	47.0	5	21.0
Constipation	4	23.5	4	16.7
Flatulence	12	70.5	14	58.3
Rumbling	13	76.4	17	71.0

The most explicit positive dynamics was observed in stomachache. In the majority of the children symptoms disappeared within initial weeks of the therapy, but in some part of them, insignificant one, the symptoms were revealed in several months. It was mostly relevant to heartburn and rumbling in stomach. Reappearance of heartburn in some children with AR allows us to think that $\frac{1}{4}$ of the patients had gastro esophageal reflux requiring additional tests and therapy. Reappearance of a symptom such as rumbling in stomach seemingly indicates the necessity of a longer therapy with probiotics (Table 2).

Table 2.

Dynamic of gastrointestinal symptoms before and after the therapy

Symptoms	Basic group n=17		Control group n=24	
	before (%)	after (%)	before (%)	after (%)
Stomachache	17 (100)	1 (5.8)	11(46.0)	5 (20.8)
Discomfort in abdomen	17 (100)	2 (11.7)	21 (87.5)	7 (29.1)
Nausea	14 (82.3)	4 (23.5)	7 (29.1)	2 (8.3)
Vomiting	10 (58.9)	-	4 (16.7)	-
Heartburn	6 (35.2)	-	3 (12.5)	1(4.1)
Diarrhea	8 (47.0)	-	5 (21.0)	1 (4.1)
Constipation	4 (23.5)	-	4 (16.7)	1 (4.1)
Flatulence	12 (70.5)	1 (5.8)	14 (58.3)	5 (20.8)
Rumbling	13 (76.4)	2 (11.7)	17 (71.0)	8 (33.3)

At the same time dynamics of flatulence was clearly positive. In the control group at the time of therapy in most of the children stomachache, discomfort in stomach, nausea, vomiting, heartburn, diarrhea, flatulence disappeared with complete absence of any changes in constipation. However, at the next hospitalization in fact many symptoms (stomachache, discomfort in abdomen, vomiting) were observed again, while the prevalence

of heartburn even increased. There were few children with nausea, flatulence and rumbling in stomach. The obtained data testify that, though the therapy of the basic disease has a positive effect on GIT, in long-term follow-up disorders in digestive system are preserved and require specialized testing and therapy.

Conclusion. Thus, recently intestinal micro biota is considered to be a leading etiological factor in the development of allergic immune pathological states, including AR in children. Data indicate the necessity of further study of both the whole microbe community and its separate representatives. The basic marker controlling allergic process in children with hereditary predisposition within initial months of life is the level of eosinophiles and total IgE. Inclusion probiotic into the therapy mostly effects intestinal micro flora recovering its misbalance in patients with AR.

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