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HETEROGENEITY OF ESOPHAGITIS IN SCHOOLCHILDREN

Abstract. *We observed 60 8-18 years old children who could have suspected features of esophagitis. Endoscopy of the esophagus was performed to all the children, during which the biopsy samples were taken. The children were divided into 3 groups: the main group №1 - 20 children with gastroesophageal reflux, who had some signs of food allergy at that time or in the past, they had standard antisecretory therapy and elimination or hypoallergenic diet, levocetirizine, probiotic bacteria Lactobacillus reuteri; the main group №2 - 20 children with gastroesophageal reflux who had pronounced manifestations of autonomic dysfunction who received standard antisecretory therapy and Phenibut; control group - 20 children with gastroesophageal reflux, who received standard antisecretory therapy. After 1 month of starting treatment an evaluation of its efficacy was conducted. Modification of GERD treatment in children with manifestations of food allergy and autonomic dysfunction promotes more rapid positive dynamics of the disease and better treatment results.*
Key words: *GERD, autonomic dysfunction, food allergies, schoolchildren*

Introduction. Pathology of the digestive organs occupies a considerable position in the structure of pediatric somatic sickness in the whole world including highly developed countries. Its current occurrence in Ukraine is 148,41per1000 children and it ahs a tendency to grow. In the structure of gastroenterological diseases among children of different ages diseases of the upper portions of the alimentary canal occupy the first position. Nowadays they constitute 49,1% of all the pathology of the digestive organs [1].

Esophageal lesions occur more and more frequently among children of different ages in a wide spectrum of chronic inflammatory diseases of the digestive tract. Since recently pathology of the esophagus has included mainly developmental abnormalities and defects, injuries of the mucous membrane due to thermal or chemical lesions or remote consequences of these lesions, today inflammatory changes of the mucous membrane occur more frequently [2].

The findings of modern epidemiological studies are indicative of an increasing occurrence of esophageal diseases, and first of all gastroesophageal reflux disease (GERD). According to literary evidence this tendency is found in all the countries of the world and involves different age periods [3, 4, 5, 6, 7, 8]. There are certain evidences concerning an increasing sickness rate for GERD among children, although, in spite of a growing interest of pediatric gastroenterologists to this pathology, the results of investigations do not enable to estimate a real spread of this disease [4-6, 8-10].

Practically all chronic esophagitis (CE) in children are considered to be a consequence of pathological gastroesophageal reflux, that is a sign of GERD. Actually, GERD is not rare in pediatric practical work, it occupies a dominating position in the structure of CE. Other possible mechanisms of its development should not be neglected.

During the recent decades a number of allergic diseases has been increasing constantly associated with lesions of the gastro-intestinal tract (GIT). The manifestations of GIT allergy are various, therefore formation of chronic esophagitis is not an exception [11].

Insufficient functional activity of the lower esophageal sphincter plays an important role in the development and progression of GERD. Its relaxation is found to be innervated by the nervus vagus through the preganglionic cholinergic fibers and postganglionic non-cholinergic and non-adrenergic nerve fibers. Therefore, investigation of the state of the vegetative nervous system in case of GERD in children promotes specification of

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pathogenic mechanisms causing development and progression of the disease [12].

Objective: to detect peculiarities of esophagitis in schoolchildren against the ground of food allergy and vegetative dysfunction in order to improve the therapeutic tactics for gastroesophageal reflux disease.

Materials and methods. 60 children aged from 8 to 18 were under our observation including 23 boys and 37 girls, who were treated at the Municipal Pediatric Clinical Hospital in Lviv with suspected esophagitis. Endoscopy of the esophagus was performed to all the children, during which the biopsy samples were taken for further verification of the diagnosis.

The children were distributed into 3 groups. The main group №1 included 20 children (7 boys and 13 girls), an average age was 14,0±2,4, with the diagnosis of gastroesophageal reflux disease (GERD), with the signs of food allergy in anamnesis or at the moment of examination; the main group №2 included 20 children (10 boys and 10 girls), an average age was 14,7±1,81, with the diagnosis of GERD, 3who had the signs of vegetative dysfunction; and the control group included 20 children (6 boys and 14 girls), an average age was 15,1±1,83 with the diagnosis of gastroesophageal reflux disease. The main group №1 received standard anti-reflux therapy and elimination or hypoallergenic diet (depending on the results of food allergy tests), levocetirizine in the dose of 5 mg once a day in the morning on empty stomach, probiotic bacteria Lactobacillus reuteri in the dose of 10^8 vital bacteria once a day irrespective of taking meals. The main group №2 received standard anti-reflux therapy and Phenibut (Noophen®, Olain Farma, Latvia) in the dose of 250 mg twice a day during 21 days. The control group received standard anti-reflux therapy according to the Order of the Ministry of Public Health of Ukraine №59 dated 29.01.2013 «Unified Clinical Protocols of Medical Aid for Children with Digestive Diseases».

The role of food allergy and causative food allergens were detected by means of skin allergy tests (prick-tests).

To evaluate vegetative changes of the nervous system Wien's questionnaire (1998) and Kerdo or vegetative index (KI) were applied.

The patients were examined twice to detect the dynamics of GERD signs, during the primary examination and 4 weeks later after the beginning of treatment.

Results and discussion. According to our findings clinical signs of esophagitis in children were not specific. The main complaints during the primary examination were pain the epigastric region of various intensity (100% of children from the three groups), low appetite (75% children of the main group №1, 80% children of the main group №2 and 75% children from the control group), heartburn (65%, 70% and 60% children respectively), periodical regurgitation (50%, 50% and 45% children respectively), nausea (25%, 35% and 30% children respectively), vomiting (10%, 10% and 15% children respectively) and dysphagia (10% of the main group №1 and 5% children from the control group).

Objective examination found pain with palpation of the epigastric region of various intensity in all the children.

The skin prick-tests made in the main group №1 presented the following results: most frequently positive tests were found for yolk and egg-white of chickens (85% and 80% respectively), cow milk casein (75%), hake and pollack (65%), soya beans, chicken, oranges, tangerines (60%), less often – lemons (55%), carp and cocoa (45%), raspberries (35%), tomatoes (30%), rarely – beef, pork, carrot (20%), grapes and water-melon (15%), beets, bananas, oatmeal (10%). 4 children (20%) from the main group had negative food allergy tests.

According to the results obtained after Wien's questionnaire an average score in the main group №2 was 24,55±3,30, and in the control group - 23,9±1,94. In addition we have found: inclination to flush (when excited) in 35% children of the main group №2 and 40% of the control group; paleness – in 5% children of the main group №2; numbness or cool sensations of finger and toes – in 45% children of the main group №2 and 40% children of the control group; the whole hands and feet – in 5% children from both groups; colour changes (paleness, cyanosis, redness) of finger and toes – in 30% and 35% children respectively; colour changes of the whole hands and feet – in 5% of the control group; heartbeat, sensations of a sinking heart or cardiac arrest – in 50% children of the main group №2 and 45% children of the control group; excessive perspiration – in 60% and 65% children

respectively; sensations of difficult breathing (lack of air, desire to take a deep breath, shortness of breath) – in 30% and 25% children respectively; functional disorders of the alimentary canal (inclination to constipation, diarrhea, abdominal bloating, stomach ache) – in 90% and 85% children respectively; cases of unconsciousness – in 15% and 10% children respectively; attacks of headache – in 25% and 20% children respectively; low ability to work, quick fatigue – in 60% children of both groups; sleep disorders (difficulty in falling asleep; troubled sleep; sleepy sensations; feeling of tiredness in the morning after waking up) – in 25% children of the main group №2 and 20% children of the control group.

At the beginning of the study KI was 14,7±12,3 in the main group №2 and 14,4± 11,2 – in the control group.

Endoscopic examination found macroscopic changes of the mucous membrane of the esophagus in 100% of all the examined children and teens.

Moreover, endoscopic examination found focal or diffuse erythema and mucous membrane swelling, multiple white coating in 100% children of the main group and 60% of the control group, erosive changes in 15% children of the main group №1, 70% children of the main group №2 and in 35% children of the control group (Fig.1).

Morphological examination of tissue sampling (material taken for biopsy from the mucous membrane of the esophagus) found the following changes: dystrophy of epithelial cells - in 90% children of the main group №1, in 75% children of the main group №2 and 65% children of the control group; destruction of keratohyalin granules - in 60%, 40% and 50% children respectively; vascular hyperemia in microcirculation - in 90%, 90% and 85% children respectively; hemorrhages of a diapedetic character – in 65% , 50% and 65% children respectively; perivascular polymorphocellular infiltration – in 35% children of the main group №2 and 5% children of the control group; focal intraepithelial hemorrhages – in 25% and 5% children respectively; swelling of the stroma – in 10% children of the main group №2 (Fig.2).

After the course of treatment a positive dynamics was observed in children from all the groups, although its rate was different. Complaints of pain in the epigastric region remained in 10% children of the main group №1, 20% children of the main group №2 and in 25% children of the control group; low appetite - in 25%, 40% and 45% children respectively; heartburn - in 10%, 30% and 30% children respectively; periodical regurgitation - in 5%, 10% and 15% children respectively; nausea - in 5% children of the main group №2 and in 5% children of the control group. There were no complaints of vomiting and dysphagia in all the groups (Table 1).

Objective examination found pain retention during palpation in the epigastric region although of less intensity in 10% children of the main group №1, 25% children of the main group №2 and25% children of the control group.

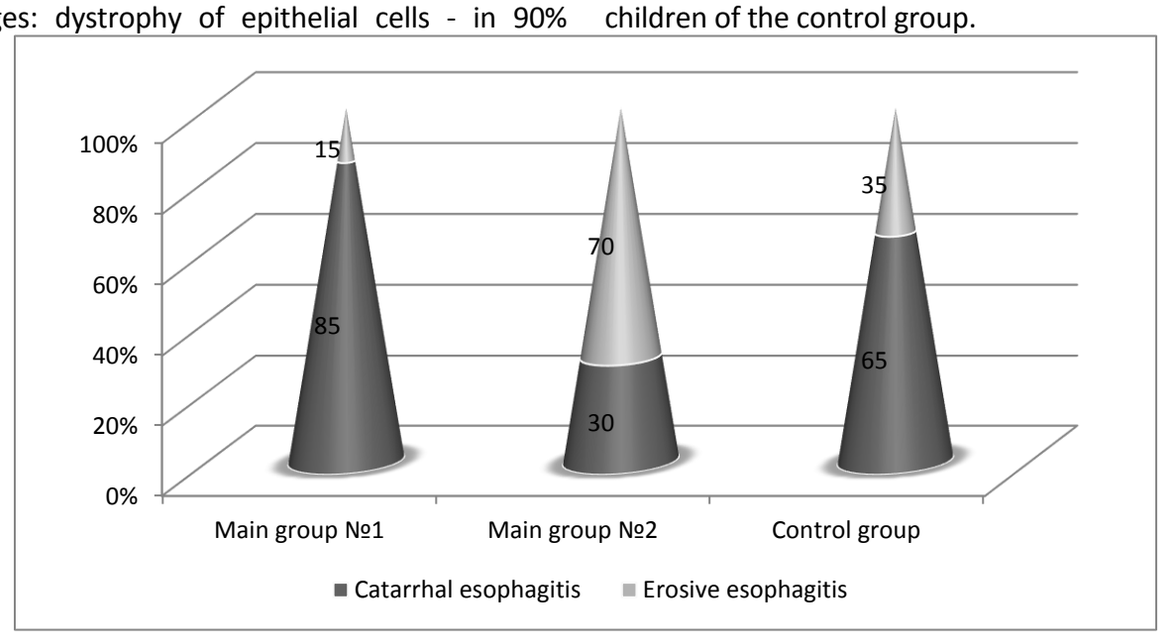

Fig. 1. Structure of endoscopic changes of the esophageal mucous membrane in schoolchildren with gastroesophageal reflux disease.

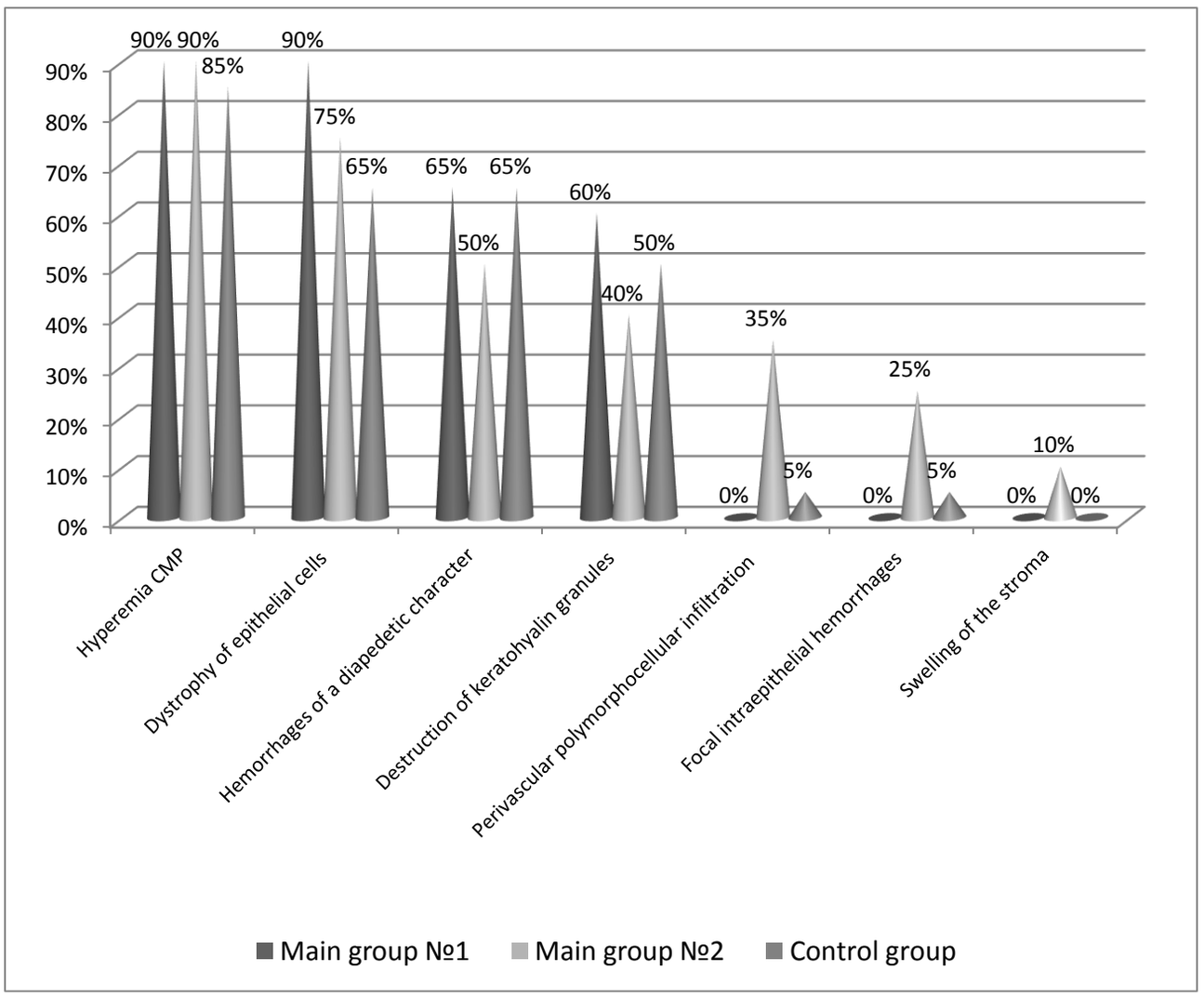

Fig.2. Results of morphological examination of tissue sampling of the esophageal mucous membrane of schoolchildren with GERD.

Table 1

Dynamics of complaints in children with gastroesophageal reflux disease

	Main group №1		Main group №2		Control group	
Indices	Before therapy	After therapy	Before therapy	After therapy	Before therapy	After therapy
Pain in epigastric region	100%	10%	100%	20%	100%	25%
Low appetite	75%	25%	80%	40%	75%	45%
Heartburn	65%	10%	70%	30%	60%	30%
Periodical regurgitation	50%	5%	50%	10%	45%	15%
Nausea	25%	0%	35%	5%	30%	5%
Vomiting	10%	0%	10%	0%	15%	0%
Dysphagia	10%	0%	0%	0%	5%	0%

A positive dynamics of vegetative imbalance signs was found in children of the control and main group №2, although in children of the main group №2 it was more pronounced (Fig.3). Thus, vegetative KI that at the beginning of the study was14,7±12,3 in the main group №2, became 5,9±7,4 ($p<0,01$), and in the control group it became also lower from 14,4±11,2 to 11,0±9,0 (Table 2)

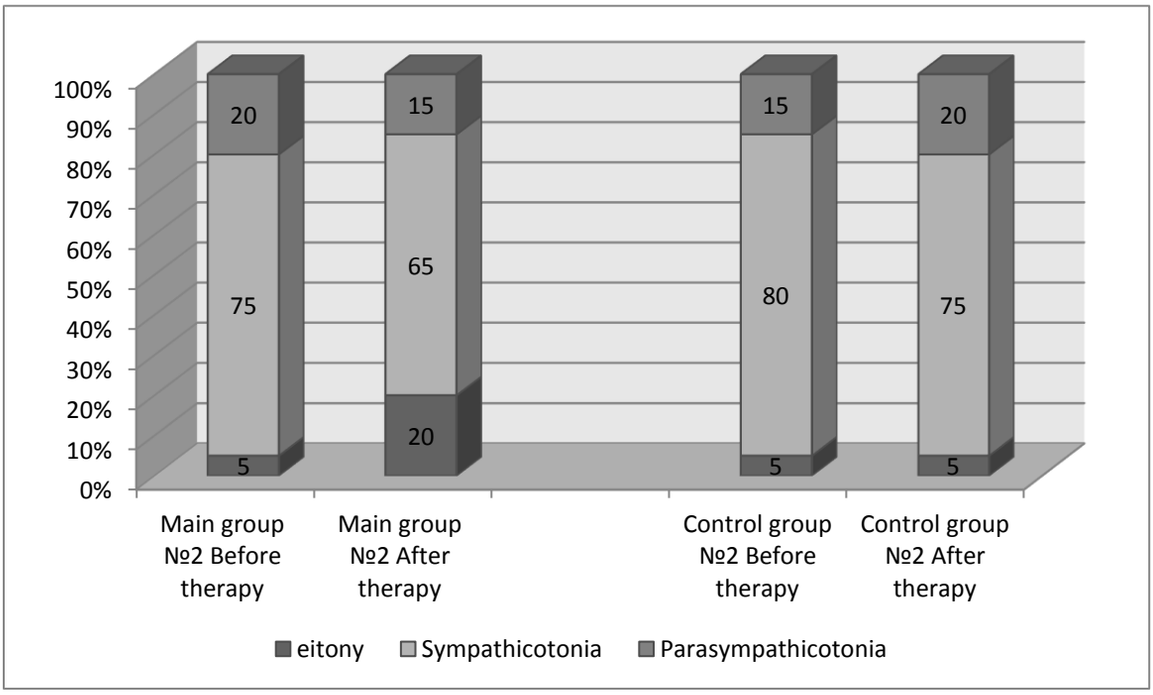

Fig 3. Distribution of children of the main group №2 and the control group according to vegetative Kerdo index before and after therapy.

Table 2

Dynamics of Kerdo index before and after treatment in two examined groups

N	Main group №2 (n=20)		Control group (n=20)	
	Before therapy	After therapy	Before therapy	After therapy
1	-1,4	0	14,6	16,7
2	14,5	12	27,1	22,2
3	16,7	8,7	-2,6	0
4	7,9	5,4	23,1	14,6
5	-2,9	1,3	18,5	22,2
6	28,6	18,6	0	-1,4
7	10,3	0	-5,3	-2,6
8	20,7	14,6	16,7	14,6
9	22,2	12,8	24,4	16,7
10	16,7	11,1	8,5	10,7
11	16,7	-2,6	-2,6	-1,4
12	36,2	14,6	22,2	10,7
13	10,3	-1,4	24,4	14,6
14	28,6	12,5	8,5	-2,6
15	-2,9	-5,3	12,5	7
16	20,0	10,3	18,6	10,7
17	-4,5	-4,2	10,7	10,3
18	0	0	8,5	8,5
19	27,8	10,3	36,2	27,8
20	28,6	0	23,9	20,5
M±δ	14,7±12,3	5,9±7,4*	14,4± 11,2	11,0±9,0

Note: * $p \leq 0,01$ – reliable difference

Conclusions. Gastroesophageal reflux disease occupies a dominating position in the structure of chronic esophagitis in schoolchildren. Symptomatology is not specific in children with GERD against the ground of food allergy and vegetative dysfunction, therefore, the diagnostic complex should include allergy tests to detect causative allergens (in children with complicated

allergic anamnesis) and tests to find the parameters of vegetative balance.

Modification of GERD treatment in children against the ground of food allergy with obligatory introduction of elimination diet, antihistamines and probiotics, as well as GERD against the ground of vegetative dysfunction with the use of vegetostabilizing agents promote quicker positive dynamics of the course of the disease and better results of treatment.

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