

## **EXTENDED ABSTRACT**

# **Endogenous Intoxication in Inflammatory Bowel Disease in Children: Substantiation of Detoxification Therapy Using Enterosorption Method**

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## **INTRODUCTION**

Diagnosis and treatment of inflammatory bowel disease (IBD) in children is a serious problem in modern gastroenterology due to the clinical forms of the disease that are severe and resistant to the conventional therapy, as well as high frequency of disability. In recent years, IBD in children is characterised by a very early onset of the disease, increased duration and severity of the inflammatory bowel lesions, and a much higher incidence of extraintestinal manifestations [1, 2].

Improving the effectiveness of modern treatment of IBD is impossible without taking into account of endogenous intoxication in disease pathogenesis and its correction. The appearance of endogenous intoxication in children with IBD is caused by systemic autoimmune inflammatory process, as well as increased intestinal permeability, degree of which depends on the extent, depth, and nature of intestinal lesions [3].

The damaging effect of endogenous toxins on cellular structures leads to even more severe immunological and metabolic imbalance that creates conditions maintaining the inflammatory process in intestinal mucosa. According to the majority of authors, low- and medium-molecular-weight substances (LMMWS) weighing up to 10,000 Da are universal markers of endogenous intoxication [4]. Clinical manifestations of endogenous intoxication in IBD are non-specific, varied, and include lethargy, anorexia, dyspepsia and trophic disorders.

The aim of this study was to investigate endogenous intoxication as one of the pathogenetic mechanisms of IBD in children, and substantiation of sorption detoxification using intestinal adsorbents (enterosorption method).

## **MATERIALS AND METHODS**

A total of 65 children aged from 5 to 17 years have been under clinical observation. Group 1 included 25 children with IBD, whereas group 2 (control group) consisted of 40 children with chronic constipation.

Degree of endogenous intoxication was assessed based on LMMWS concentration in erythrocytes, plasma, and urine by the method of M. Ya. Malakhova *et al.* (spectrogram of the supernatant in the wavelengths range of 238–298 nm) [5].

## RESULTS AND DISCUSSION

Endogenous intoxication was detected in all patients of group 1. Plasma LMMWS concentration was 1.5-fold higher in the patients with IBD than in the children with constipation. Measurement of urine LMMWS concentration allowed evaluating the detoxification capabilities of the body. In the children of group 1, the urine LMMWS concentration was significantly higher than that in the children of group 2. Simultaneous determination of oligopeptides (OP) giving a positive Lowry reaction allowed quantitatively evaluating the proteolytic activity in blood. Significant increase in OP levels was noted in the patients of group 1.

Coefficient of intoxication (CI) is an integral indicator of endogenous intoxication and is calculated using the following formula:

$$CI = LMMWS_{\text{plasma}} \times OP_{\text{plasma}} + LMMWS_{\text{erythrocytes}} \times OP_{\text{erythrocytes}}$$

CI was significantly much higher in children of group 1 ( $p = 0.05$ ). Predominant accumulation of LMMWS in plasma was noted in patients with IBD due to the decrease in sorption capacity of erythrocytes ( $p = 0.05$ ).

Confirmation of endogenous intoxication in children with IBD serves as a basis for performing detoxification therapy in conjunction with standard therapy. The non-invasive method of sorption detoxification using intestinal adsorbents (enterosorption) is considered preferable. Therapeutic action of enterosorption is caused by the direct and mediated effects [6]. Direct effects are related to the physical and chemical mechanisms (adsorption, absorption, ion exchange and complex formation) taking place on the active surface of various porous systems while adsorbent passes through the intestinal lumen. Mediated effects are control and prevention of allergic inflammation and intoxication, reduction in the metabolic load on the organs of excretion and detoxification, correction of metabolic processes and immune status of sick child, restoration of integrity and permeability of the intestinal mucosa, improvement in the functional status of the intestine (reduction of flatulence, and improvement of microcirculation).

The data of comparative studies of modern intestinal adsorbents indicate that the medication of choice for children with IBD is Enterosgel (organosilicon adsorbent). Enterosgel effectively binds toxic substances of different origin without reducing the absorption of vitamins, microelements, and calcium. Thanks to its gel-like consistency, Enterosgel has exhibits obducing and cytoprotective effects, promoting

the healing of ulcers and erosions. Enterogel has a high level of safety; and it can be used for a long period without causing colonic atony or flatulence. Enterogel suspension is easily diluted with water; and it is prescribed orally 1–2 teaspoons 1–2 hours before or after a meal, 3 times a day (15–30 g/day) for children aged 1–5 years and 2–3 teaspoons 3 times a day (30–45 g/day) for children over 5 years of age. The duration of the treatment course is 2–3 weeks. There are no restrictions on the number of repeated courses.

## CONCLUSIONS

IBD in children is accompanied by the development of endogenous intoxication, manifestation of which is conditioned by the severity of the process and dependent on the nature of intestinal lesion.

Enterosorption is an effective and safe method of sorption detoxification in the combination treatment of IBD in children, since it reduces the toxic load on the detoxification system of the body and the risk of developing infectious and autoimmune complications.

Enterogel is the adsorbent of choice since it has high effectiveness and safety in young children, significant cytoprotective effect, convenient pharmaceutical form, and can be used in a long-term repeated course.

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