Role of Enterosorption in the Treatment of Liver Diseases

**Authors:** I.G. Paliy, MD, Professor, Department of outpatient therapy and family medicine, National Pirogov Memorial Medical University, Vinnytsya.

**Subjects:** Gastroenterology

In recent years, enterosorption has been widely used in clinical practice as one of detoxification methods. Thanks to its simplicity, safety and economy, this approach is now successfully applied in treatment of various diseases both on inpatient and outpatient bases.

Binding of toxic substances by a sorbent occurs through adsorption, absorption, ion exchange and complex formation. Basic mechanisms of enterosorbent action: 1) absorption of the toxic substances that enter the gastrointestinal tract (GIT) from the outside; 2) absorption of toxins which diffuse into the lumen of the blood; 3) binding of toxic substances discharged from the luminal fluids; 4) absorption of toxic metabolites formed in the gastrointestinal tract (indole, skatole, etc.); 5) sorption diet modification by selective absorption of amino acids and free bile acids; 6) transfer and fixation of physiologically active substances (enzymes, bile acid, etc.); 7) changes in the volume of indigestible residue by the type of dietary fiber; 8) The catalytic action. Additional enterosorbent mechanisms of action are: 1) coating and cytoprotective action; 2) Structuring of the intestinal contents; 3) formation of aggregates and flocculate containing microbes and viruses; 4) direct bactericidal action; 5) complexation and chelation; 6) modification of the chemical composition of the intestinal contents, unfavorable for breeding of pathogens [1].

Thus, enterosorption reduces the toxic load on the excretory organs, primarily the liver and kidneys. In addition, enterosorbents, staying within the gastrointestinal tract, and not having their own pharmacodynamics, have a powerful system (distant) effect on the body, eliminating lipid metabolism, suppressing elements of the systemic inflammatory response, promoting the recovery of all parts of the immune system and improving the function of internal organs [1-4].

Multifaceted action of enterosorption made it an essential component of combination therapy of diseases, such as acute intestinal infections, colitis and enterocolitis, intestinal dysbiosis, poisoning, skin diseases, kidney disease, especially accompanied by renal failure, atherosclerosis, diabetes, asthma, hepatitis, immune system disorders and others.

Due to violations of the metabolic processes, patients with acute and chronic liver disease of various origins develop metabolic intoxication syndrome that is based on the accumulation of average mass molecules (AMM) in the blood, causing a toxic effect on the cells of the liver, kidney and brain neurons. In severe course of the disease, blood accumulates ammonia, which leads to the development of toxic encephalopathy and hepatic coma. Therefore, detoxification plays an important role in the treatment of patients with liver disease [5].

Clinical efficacy of enterosorption in liver diseases is determined by both direct and indirect mechanisms. Detoxicating action against toxic metabolites and bacterial toxins is related to direct mechanisms. Enterosorbents bind toxins in the intestinal lumen and interrupt the process of their resorption and recycling in the body, which helps to reduce the metabolic and toxic load on the liver, accelerating the processes of liver tissue reparation [6]. The indirect effect of enterosorption is due to the ability of enterosorbents to maintain normal bowel microbiocenosis, enhancing digestion in the small intestine and increasing the metabolic activity of enterocytes, the detoxification system power and substrate biotransformation of which per totality are equal to the liver. In addition, detoxification of the body by means of enterosorption has a positive effect on the functional state of other organs and systems, including the immune system [4, 5].

Enterosgel is one of the most effective enterosorbents, due to its selective sorption activity with respect to medium molecular weight toxic metabolites (including bilirubin, cholesterol, etc.), as well as to pathogenic microbes and viruses [7]. Unlike other sorbents Enterosgel does not damage the mucosa of the stomach and intestines and does not accumulate in the organism. Besides, it has virtually no contraindications and side effects, thus can be considered a safe medication [8, 9].

All this allowed Enterosgel to take a leading position among medicines of sorption and detoxication effect.
In recent years, a number of studies have been undertaken in Ukraine and neighboring countries. These studies were dedicated to different aspects of the clinical use of Enterosgel in the treatment of liver diseases.

N.A. Gorchakov, I.S. Chekman et al. carried out an experimental study of the specific activity of Enterosgel on toxic hepatitis model and discovered hepatoprotective and antioxidant effect of the medication: it prevents damage to hepatocytes, increase in liver tissue of lipid peroxidation indices, and in blood serum – of markers of liver tissue damage (transferase) and protein content. Enterosgel also prevents reduction in the activity of antioxidant defense enzymes (superoxide dismutase and catalase) in liver tissue in conditions of intoxication [8].

A number of studies have shown that Enterosgel does not disturb the digestion of fats, proteins, carbohydrates, vitamins and does not affect the absorption of electrolytes. It helps to restore enteral barrier, to prevent the absorption of toxic substances from the intestines and to recover the protein-synthesizing function of the liver [8, 10, 11].

The study of A.I. Mosunov et al. concerned the efficacy of Enterosgel in the complex therapy of chronic liver disease of various origins [12]. The course of treatment with Enterosgel could last for 12 days (with acute toxic hepatitis) to three months (with active liver cirrhosis of viral etiology). The study results demonstrated that the inclusion in the scheme of treatment of enterosorbent Enterosgel in these patients contributed to rapid positive dynamics of clinical symptoms: normalization of sleep, disappearance of skin itching, fatigue, apathy, stabilization of defecation accompanied by normalization of biochemical parameters, liver and spleen size according to ultrasonic data. At the same time, indices of lipid, enzyme, nitrogen metabolism, as well as those of cytolytic state and mesenchimal-inflammatory response showed stabilization. The authors come to a conclusion that enterosorption with Enterosgel accelerates liver tissue repair, due to excretion of toxic metabolites and reduction of the toxic and metabolic load on hepatocytes.

The use of Enterosgel in the combined therapy of patients with acute viral hepatitis B and associated intestinal dysbiosis was studied by L.V. Moroz, I.G. Paly et al. In viral hepatitis, the positive effect of Enterosgel manifests at different stages of the disease. This medication greatly reduces the toxic and metabolic burden on the liver, removing toxins, xenobiotics, metabolites of drugs, and thereby facilitating the functioning of hepatocytes against the backdrop of viral infection. Results of the study demonstrate the necessity of inclusion of Enterosgel into the combined therapy, as this enterosorbent eliminates toxicosis, promotes rapid regression of the main clinical symptoms and normalization of bowel microbiocenosis. Moreover, Enterosgel significantly reduces the level of circulating immune complexes in the blood serum and helps to improve immunological parameters [13].

A solid therapeutic effect was also observed when Enterosgel was included into the combined therapy of patients with chronic viral hepatitis [14]. The use of the medecine not only eliminates endotoxemia, but also contributes to a more rapid regression of clinical symptoms and improvement of the quality of patients’ life. The positive effect of Enterosgel in infectious hepatitis is also associated with improvement in immune parameters, which is especially notable for cellular immunity. The results showed the effectiveness of early and quite long (during 20 days) use of Enterosgel to achieve a sustainable normalization of bowel microbiocenosis in patients with concomitant dysbiosis. The process of the medication intake revealed its good tolerability and the absence of adverse events.

Inclusion of Enterosgel medication into the combined therapy of patients with non-alcoholic steatohepatitis against the backdrop of coronary artery disease and diabetes mellitus type II is an effective and safe treatment of this pathology of the liver and the correction of lipid metabolism disorders. According to M.N. Dolzhenko et al., Enterosgel improves the functional state of the liver and contributes to the elimination of lipid distress syndrome, including diabetic dyslipidemia, reduction of systemic inflammation activity and atherogenic potential of blood plasma. The obtained data allows to consider enterosorbent Enterosgel an effective medecine for the preventing progression of atherosclerosis in patients with non-alcoholic steatohepatitis, combined with coronary heart disease and diabetes type II [2].

The growing use of detoxifiers, including Enterosgel in the treatment of various diseases of the digestive tract attests to the understanding by clinicians the importance of endotoxia, which exercises a significant impact on the course and outcome of many diseases. B.S. Sheiman, I.V. Bagdasarova et al. studied detoxifying properties of enterosorbent Enterosgel and developed criteria to optimize the indications for its use [15]. The data obtained by the authors indicates the selective detoxification action of Enterosgel against toxins with small- and medium-sized molecules that are not firmly bound to blood proteins, or are in a free state. The accumulation of these toxins is observed in the majority of infectious and inflammatory diseases of different localization, dismetabolic and diselectrolyte disorders, and various intoxications. In this regard, the inclusion of detoxicant Enterosgel in the complex of therapeutic measures in these types of diseases is pathogenetically due and necessary.
Thus, the high efficiency of enterosorbent Enterosgel, its selective sorption action, simplicity and safety, and the possibility of a combination with other medications allow the medical officer to optimize the therapeutic tactics in various diseases of the liver, to achieve high efficiency and reduce time of treatment and rehabilitation of patients.

References


2. M.N. Dolzhenko, V.P. Shipulin, L.K. Sokolova The role of enterosorption in the lipid-lowering therapy in patients with non-alcoholic steatohepatitis associated with coronary artery disease and diabetes mellitus type II.


