

Report: Influence of structural components of enterosorbents on the state of the intestine in severe heat burns

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Disability after severe burns is one of the most complex problems of contemporary medicine. Deep extensive burns are characterized not only by local tissue damage at the site of exposure due to high temperatures, but become the cause of long-term changes in the internal organs and systems. They are collectively classified in the nosology as "burn disease", which is a stage of toxemia.

Modern methods of detoxification therapies are not completely effective, therefore search continues for new methods of combating intoxication.

In recent years, a publication appeared in the literature on the successful use of enterosorption in treating burn patients as one of the methods of detoxification organism, which is based on the removal of toxins from the digestive system. In connection with it has been the subject of research knowledge structures intestines of animals with burns after treatment enterosorbents Enterosgel.

The experiment was performed on 60 guinea pigs weighing 550-600 g. Burn epithelial skin layer during general anesthesia was induced back steam at temperature 96-97 for about 60 seconds. The extent of the damaged areas are determined according covers an area of skin, the average area of damaged skin accounted for 18-20% skins of animals. The damaged area was calculated according to a special table.

Histological examination showed damaged skin, as a result, those circumstances arose burn grades III-AB, which corresponds to modern are the development of experimental burns disease.

Experimental animals were divided into two groups:

Group 1 - with burns guinea pigs (control group)

Group 2 - animals with severe burn damage, which were administered Enterosgel in the stomach at a dose of 0.3 g / kg for 14 days.

In animals decapitation was performed under general anesthesia on the seventh day from the beginning of experiment, corresponding to the early stage of toxemia, 14th day from the beginning of the experiment, which corresponded to the late stage toxemia, and day 21, which corresponds to stage of septic toxemia.

In carrying out the tasks set general and histological inquiry procedures were applied and methods using an electronic microscope.

The results of morphological examination of the control group of animals suggest considerable damage to the structure of the intestinal mucosa due to severe burns. As a result of a breach of microbial stream swelling of the mucosa was detected with extensive deep erosive injuries, and ulceration of numerous small hemorrhages. There was a significant disruption of ultrastructure of columnar epitheliocytes and other cells, which negatively influenced the process of membrane digestion and absorption. About 26% reduction in the action of alkaline phosphatase, 40% - of dehydrogenase activity. 1.4-fold decreased mitotic index, suggesting the reduced proliferation and restoration of damaged epitheliocytes.

Examination by electron microscopy revealed damage to the structure of compensatory adaptation reactions, development of dystrophic and destructive changes. To apical surface of columnar cytoplasm vacuoles appear epitheliocytes bounded by the membrane. Vacuoles contain microbial cells.

Concurrently with disorganization of epithelial layer it has been found to damage the epitheliocytes and intestinal capillaries. Damage to the basic components of nonspecific enterohematic barrier allow

penetration of microbial flora into the bloodstream, thus heightening endogenous intoxication of the organism.

On microscopic examination of muscle myocyte membrane of the intestine reduction was found of intracellular vesicles and dense bodies myofilaments. Relatively often myocytes appeared with the cytoplasm, which was considerably reduced number of thin myofilaments, dilated ducts granular endoplasmic network perinuclear membranes kernel space. The mitochondria matrix was also thinner.

Described changes visibly represented the structural basis of paralysis of the intestine, which was often found at autopsy in experimental animals.

Significant improvement of morphofunctional intestinal condition was apparent after administration of enterosorbent to the animals. Above the better was preserved structure of microbial and histohematic barriers. In connection with this, dystrophic changes were less exhibited and epitheliocytes desquamation was less frequently observed. Areas with deep mucosal damage were hardly detected.

Examination by electron microscopy testified the preservation of plasma and organoid membranes, which had a clearly positive effect on digestion of walls and absorption of nutrients. Morphologically, it was confirmed by increasing the number pinocyte vesicles and lipid bodies in the apical cytoplasm of columnar epitheliocytes.

Enterogel has a positive influence on the structure of the intestinal wall myocytes. Increase was observed in the number of intestinal vesicles and myofilaments.

There has also highly rarely appeared deep muscle cell damage, which was visibly morphological manifestation of removal and restoration of intestinal peristalsis paralysis.

With regard to the positive effect on the development of Enterogel compensatory adaptation and recovery processes in the intestine consider it justified its use in the complex treatment of patients with severe burns.

Thus, the results of the experiments suggest that as a result of severe burns pathological process develops that is characterized by impairment of all components of the small intestine of different scale and character. To a large extent the damage is subject to high concentrations of endogenous and exogenous toxins damaging the organism.

We have proved regularity of development of dystrophic and nekrobiotic processes, which originated in the intestinal wall during severe thermal burns of the skin, we have also justified pathogenic conditional use of enterosorbents for reduction of toxin levels in the blood affecting stabilization of the structures of the small intestine and regeneration, providing improved membrane of digestion and absorption, peristalsis and evacuating the contents of the intestine, improving immunological reactions, and also preventing the invasion of microflora through enterohematic barrier. In this manner improvements in the structure of the small intestine help to restore the functioning of the digestive organs in the treated animals during the development of burn disease. Enterogel has had a positive effect on the processes, general condition and viability of burned animals. About 3-4 days earlier than the control group they experienced to release of scar formation and improvement of epithelial burns.