

**PHYSIOLOGICAL ASPECTS OF MORPHOFUNCTIONAL CHANGES IN THE  
DIGESTIVE TRACT UNDER STRESS  
(LITERATURE REVIEW)**

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**Relevance:** In modern society, stress is an integral part of everyday life. The effect of stress on physiological processes has a significant impact on the body. One of the system components exposed to stress is the digestive tract. Morphofunctional changes in the digestive tract under stress are an important aspect in understanding the body's adaptive mechanisms to adverse effects [2].

**Annotation:** The digestive tract, being the key system of the body, provides the necessary substances to maintain the vital activity of all cells and tissues. Numerous studies demonstrate that stressors, acting on the body, can cause morphological and functional changes in the structure and functioning of the digestive tract. These changes, in turn, are accompanied by adaptive reactions aimed at maintaining homeostasis and survival of the body under stress [15].

**Key words:** FA (Physiological aspects) MI (Morphofunctional changes) HS (Gastrointestinal system) HC (Secretion of gastric juice) VSO (Inflammation of the mucous membrane) HC (Neuroendocrine system).

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**The purpose of the study:** The purpose of this article is to analyze in detail the literature on the study of physiological aspects of morphofunctional changes in the digestive tract under stress.

**Materials and methods of research:** The materials of this study were articles, abstracts, abstracts taken from the medical sites PubMed, Elsevier, Google academia, Cyberleninca. Their retrospective analysis was carried out.

**Results and discussions:** Stress is one of the factors contributing to the development and exacerbating the course of diseases of the gastrointestinal tract

This research project is carried out in the context of a broad field of medical and biological science, including research on the adaptation of the body to chronic liver damage and their effect on other systems. A number of previous studies have shown that chronic liver diseases can cause dysfunction in the gastrointestinal tract, including in the work of endocrine cells of the mucous membrane. For example, the author's work revealed that chronic hepatitis causes changes in the structure and function of endocrine cells of the small intestine in rats. Such changes in the endocrine system can affect digestion and metabolism. The study confirmed that pathological changes in the liver in female rats can affect the morphology of endocrine cells of the colon, which in turn can have consequences for digestion and general health [13].

The study of morphofunctional features of the epithelium of duodenal crypts in the offspring of female rats with experimental liver damage is an urgent problem from the point of view of modern medical and biological science. Here are a few reasons why this topic is of important interest: The prevalence of liver diseases: Chronic liver diseases pose a significant public health problem. They include alcoholic hepatitis, cirrhosis of the liver, viral hepatitis and others. These diseases can affect the functional state of other organs and systems. The effect of liver diseases on the gastrointestinal tract [11].

Intensive feeding of pigs in modern agricultural conditions requires constant search for effective methods of maintaining animal health, especially in the context of morphofunctional disorders of the digestive tract. In this context, the use of natural detergents of sorption action is an

interesting area of research. This review article presents the results of research on the use of natural sorbents in pig diets [10].

The study of the effect of nutrition on the morphogenesis of the muscular lining of the colon is an important topic in the field of physiology of the digestive system. It is especially interesting to study the effect of prolonged consumption of dispersed food on the structure of the muscle tissues of this part of the gastrointestinal tract in white rats. White rats aged 3 to 6 months were selected for the study. The animal groups were divided into two: a control group that consumed standard food, and an experimental group whose diet was dominated by dispersed food for a long time. After the experiment was completed, the animals were autopsied and tissue samples were collected for subsequent analysis [3].

Morphofunctional changes in the mucous membrane of the small intestine in chronic alcohol intoxication is an important area of research of practical importance in the context of human health. The effects of alcohol on the body, in particular on the digestive system, can cause serious pathological changes, which makes this topic the subject of in-depth analysis and study, devoted to this topic, were conducted on experimental animals in order to identify and analyze morphofunctional changes in the mucous membrane of the small intestine under the influence of alcohol [15].

This work is devoted to the study of the effect of damage to the hepatobiliary system (liver) on the morphofunctional characteristics of endocrine and mast cells of the duodenum of offspring of female rats with chronic B-galactosamine liver damage. The study used white female laboratory rats and their offspring exposed to chronic liver damage with B-galactosamine. The results of the study showed that in experimental animals, compared with the control group, there is an increase in the number of endocrine and mast cells [14].

This study is devoted to the study of the development of protective functions of the supraepithelial mucous layer of the gastrointestinal tract in healthy pigs during postnatal development. The analysis of mucus components, its antioxidant and antiradical activity showed a number of features depending on age: mucus glycoproteins determine its physico-chemical properties and epithelial protection functions. Their biosynthesis and secretion depend on hormonal background and nutrition. These processes end when puberty is reached and the transition to a definitive diet. The composition of glycoproteins changes with age: piglets switching to a definitive diet have a lower monosaccharide content, which indicates more branched oligosaccharide chains [2].

The authors note that hypermotor activity of the digestive tract was previously considered the main cause of diarrhea, but today these ideas have changed. Diarrhea leads to various disorders of water metabolism, loss of water and secretion, as well as a decrease in absorption. The work examines in detail the various levels of protection of the small intestine from the effects of harmful agents. Barriers such as the intestinal cavity, the subepithelial mucus layer, the water-electrolyte layer and the glycocalyx are described [6].

This work is devoted to the study of the digestive system in young ruminants in the early period of their development. In the initial stage of ontogenesis, when nutrition consists mainly of milk, digestion occurs mainly in the small intestine under the influence of pancreatic and intestinal enzymes. The fermentation processes in the rumen, necessary for the digestion of coarse feeds, are poorly developed. Important qualitative changes in the digestive system of lambs occur during the first 3-5 weeks after birth, when the transition to the consumption of vegetable feeds begins [4].

The work is a study of the biochemical properties of microflora in patients with gastroesophageal reflux disease (GERD) with manifestations of distal gastroesophageal reflux (DHER). The authors compare microorganisms isolated from the mucous membrane of healthy people with

those isolated from patients with GERD. The results show that patients with GERD with DHER have an increased activity of pathogenic factors in microorganisms [10].

This literature review describes the results of studies related to morphological changes in the mucous membrane of the digestive tract in patients with irritable bowel syndrome. According to the authors, despite the fact that irritable bowel syndrome is considered as a functional disease, histological data indicate the presence of pronounced morphofunctional changes in the gastrointestinal tract [2]

This paper discusses the importance of rational food hygiene for normal growth and development of the body. The author emphasizes that violations of this hygiene are often observed in everyday life, which can lead to various problems such as immunodeficiency, metabolic disorders, obesity and others. Special attention is paid to malnutrition, which is common among hospitalized patients, especially those who receive parenteral nutrition. The author describes various factors contributing to malnutrition, including primary and secondary malnutrition, as well as diseases of the digestive tract. The work emphasizes that the lack or excess of certain nutrients (proteins, fats, vitamins, trace elements) affect the body, causing various changes and pathological conditions. The author also points out the effect of a protein diet on the body, noting that when using it, it is necessary to increase water intake [12].

This article provides an overview of research on the role of intestinal lymphoid tissue in the immune system. Intestinal lymphoid tissue associated with the intestine (LTAC) plays an important role in the presentation of antigens to immunocompetent cells and the subsequent immune response. The elements of this system are dynamic and subject to the influence of various stress factors. The article presents the results of studies of the parameters of intestinal lymphoid tissue in clinically healthy rats. The study was conducted on white mongrel sexually mature male rats. The material for the analysis was intestinal tissues treated according to standard methods. It has been shown that lymphoid plaques (LB) are grouped formations located in the intestinal mucosa. The epithelium in contact with the FOREHEAD is characterized by the absence of goblet cells. LB is a parenchymal organ represented by lymphocytes and macrophages [4]

The purpose of this study is to study the morphofunctional state of the stomach and caecum in white rats after a course of administration of clarithromycin. The experiment involved 30 white male rats of reproductive age with a weight of  $200.0 \pm 20.0$  grams. The course of antibiotic therapy was carried out by administering clarithromycin with food twice a day. Sections of the stomach and caecum were used for the analysis. Tissue sections were studied under a Cone light microscope. Morphometric data were obtained using a Sigeta object micrometer with divisions of 1 mm/100 and an accuracy of 0.01 mm. The study revealed significant changes in the morphofunctional state of the stomach and caecum in experimental rats [1].

Currently, the study of the pathophysiology and pathomorphology of functional disorders of the gastrointestinal tract (GI tract) is an urgent area of medical science. The main purpose of this study is to systematize modern scientific data related to the mechanisms of occurrence and development of these pathologies. One of the key points identified in the literature is a complex change in the neuroendocrine and nervous regulation of the digestive tract, due to genetic polymorphism and the influence of external provoking factors, in which stress plays a major role [7].

**Conclusion:** In this literature review, the main aspects of physiological changes occurring in the digestive tract during stressful conditions were considered. Research in this area allows us to understand the mechanisms of stress on the organs and systems responsible for digestion, which in turn opens up prospects for the development of effective methods for the prevention and

treatment of digestive disorders caused by stress. One of the key findings is that stress has multiple and complex effects on the functional state of the digestive tract

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