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STUDY OF MORPHOLOGICAL CHANGES IN THE SMALL INTESTINAL WALL OF 3-MONTH-OLD WHITE-BORN MICE UNDER THE INFLUENCE OF LOW CONCENTRATION ACETIC ACID.

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ANNOTATION

Actively ongoing research into chemical burns of the gastrointestinal tract confirms the complexity and relevance of this problem. According to the American Association of Poison Control Centers, in 2008 alone, more than 1.6 million children were poisoned, with alkaline esophageal burns occurring in 18-46% of cases after ingestion of various household chemicals.

Keywords: Acetic acid, Gastrointestinal tract, esophagus, small intestine

Introduction

Chemical burns of the digestive tract with acetic acid can cause burns of the gastrointestinal and respiratory tracts, either accidentally or as a result of suicidal ingestion of the substance. The circumstances of the incident and the chemical nature of the substance determine the degree of damage and the toxicological risk. The early period after a chemical burn is associated with the possibility of laryngeal edema, perforation of the esophagus, stomach and intestines, gastrointestinal bleeding, and pancreatitis [1,3].

Currently, chemical burns of the digestive tract of various degrees are a very urgent medical, social, and economic problem. Severe upper gastrointestinal burns affect 10–33% of adult patients, with a mortality rate of up to 10%. [4].

Two age groups are at greatest risk: children aged 2–6 years, who inadvertently ingest household cleaning products and who are responsible for up to 80% of caustic ingestions, but who usually have minor injuries; and adults aged 30–40

years, who use highly corrosive substances with suicidal intent and present with serious, life-threatening injuries [6].

Objectives of the study

To determine morphological changes in the small intestinal wall of white crossbred rats exposed to varying degrees of acetic acid in the digestive tract, and to use a biological correction method using black cumin oil to reduce the adverse effects of the chemical.

Since the morphological changes in the small intestine during chemical burns with acetic acid have been poorly studied, chemical burns were induced under experimental conditions, and the resulting morphological features of the small intestine were studied and analyzed.

Group I Control group (n=20) When the abdominal cavity of the 3-month-old white crossbred rats in the control group was opened, we saw that the small intestine consisted of three parts. Duodenum, jejunum, ileum. Intestinal villi and crypts are the main structural and functional units of the small intestinal mucosa.

In 3-month-old rats in the control group, all components of the duodenum were fully developed. The average thickness of the duodenum wall is up to 814.71 μm, the average thickness of the mucous membrane is 671.97 μm, the average height of the villus is 342.83 μm, the average height of the villus epitheliocytes is 28.36 μm, the average depth of the crypts is 228.27 μm, the average number of crypt epitheliocytes is 97.51 μm, the average height of the crypt epitheliocytes is 18.86 μm, the average thickness of the muscular layer is 139.62 μm, the average thickness of the inner muscular layer is 89.91 μm, the average thickness of the outer muscular layer is 42.68 μm.

Group II: All laboratory animals (100.0%, n=20) injected with 6% acetic acid showed morphological changes in the small intestine.

In particular, changes in the intestinal villi and intestinal crypts were observed, the inner circular layer was slightly expanded, the sparse fibrous connective tissue was enlarged, and the lymphoid nodule (Peyer's patch) was hyperplastic. (Figure 6) The

average thickness of the duodenal wall was up to 810.70 μm, the average thickness of the mucosa was 669.72 μm, the average height of the villus was 339.93 μm, the average height of the villus epithelial cells was 27.42 μm, the average depth of the crypts was 227.93 μm, the average number of crypt epithelial cells was 96.67 μm, the average height of the crypt epithelial cells was 17.93 μm, the average thickness of the muscular layer was 131.9 μm, the average inner thickness of the muscular layer was 89.31 μm, and the average thickness of the muscular layer was 131.9 μm. We see that the outer layer thickness decreased by an average of 42.54 μm.

Group III was corrected with cedar oil for thirty days after the administration of 6% acetic acid. In all laboratory animals (100.0%, n=12), morphological changes in the duodenum were detected (Figures 10-11). In particular, changes in the intestinal villi and intestinal crypts, an expanded internal circular layer, an increase in sparse fibrous connective tissue, and lymphoid node (Peyer's patches) hyperplasia were observed.

We see that the thickness of the duodenum wall has increased to 815.22 μm, the thickness of the mucosa is 672.33 μm, the height of the villus is 342.92 μm, the height of the villus epitheliocytes is 28.38 μm, the depth of the crypts is 228.30 μm, the number of crypt epitheliocytes is 96.92 μm, the height of the crypt epitheliocytes is 18.90 μm, the thickness of the muscular layer is 140.12 μm, the inner thickness of the muscular layer is 89.98 μm, and the outer thickness of the muscular layer is 42.72 μm.

Conclusion

In experimental chemical burns of the gastrointestinal tract, the following morphological changes were detected in the small intestine, including focal atrophy of intestinal villi, dystrophic and necrobiotic changes in crypts and villi, a slight reduction in the muscular layer, the appearance of signs of inflammation in the intestinal crypts, signs of inflammation and edema in the inner circular layer, a slight increase in sparse fibrous connective tissue, and signs of infiltration in the submucosa. Their detection indicates the presence of dystrophic changes and an inflammatory process in the small intestine.

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