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# **STRUCTURAL CHANGES IN THE DIGESTIVE TRACT IN A CASE OF EXPERIMENTAL DUODENOGASTRIC REFLUX**

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**Abstract.** Experimental reproduction of duodeno-gastric reflux was performed among Wistar line 28 rats, which were injected with 50 % solution of medical bile by intragastric way. Morphological study had been shown significant structural changes in the gingival tissues, mucous membrane of an esophagus, stomach and duodenum.

**Introduction.** The bile or alkaline reflux is a well-known retrograde spillage of bile from duodenum into the anatomically highly situated organs – stomach, esophagus and oral cavity[1–3]. Pepsin and combination of pepsin with the conjugated bile acids in an acidic environment are the basic aggressive factors, which destroy a protective barrier of mucous membrane in the stomach and duodenum[4–7]. However, a role of bile at the appearance of esophagus and oral cavity lesions in a case of DGR is uncertain.

**Purpose of research** – to identify structural changes in the digestive tract tissues in a case of experimental model of duodeno–gastric reflux.

**Material and methods.** The model of reflux was reproduced with 28 immature rats of both sexes of Wistar’s line. The control group consisted of 12 intact animals. Laboratory rats in the experimental group were administered for 30 days with 50 % solution of medical bile by intragastric way in the amount of 1 ml per 100 g of animal weight once a day. Second stage of the experiment lasted 10 days. During the second stage rats’ diet was restricted by 1/3 and they were injected with 50% solution of

medical bile. Feeding the animals was performed twice daily. The animal had been given 1/3 of the cut down feed in the morning, 6–7 hours before the injection of bile and water was given without any restrictions. Water dishes had been taken before 1 hour till the bile injection. The last part of a diet was given 1 hour after the bile injection and then the rats were given water without any restrictions.

Results of the study and their discussion. At the morphological research after the first stage of experiment was discovered an irregular thickness of the gingival epithelium, presence of the dyskeratosis symptoms, incomplete keratinization. In the epithelium swelling of cells, formation of a pericellular edema, focuses of the hydropic degeneration and destruction of epithelial cells, formation of bubbles in a border of the thorny and keratotic layer were visualized. Basal layer of an epithelium sometimes was represented by two rows of cells, which indicated about activation of proliferative processes in the gingiva. Mitotic activity in the basal and parabasal layer of epithelium was intensive. In the gingival lamina propria the collagen fibers were thickened and hardened. After second stage of the experiment was shown reduced thickness of the epithelium, closely connected with decreasing of the thorny and keratotic layer as a result of the epithelium desquamation. In a thorny layer visualized cells with symptoms of karyolysis and karyopyknosis. Basal layer of cells has an uneven thickness, sometimes manifested phenomena of mild dysplasia. Cells of the basal layer have a cylindrical shape. Collagen fibers in the gingival lamina propria were thickened and hardened. Focuses of the light plasmatic impregnation were revealed phenomena of fibrosis and obstruction of blood capillaries was found.

After the first stage of experiment in the esophagus mucosa were observed effects of hyper- and parakeratosis. Layer of cell keratinous was sharply and irregularly thickened, in some places was on 1/3 from the epithelium width. A granular layer has been thinned; the basal layer in some places was represented by two rows of cells, which indicated about infringement processes of differentiation in the epithelial layer. In the esophagus lamina propria visualized phenomena of fibrosis of a papillary layer. Capillaries were determined in the deeper layers of a connective-tissue plate.

After the first stage of experiment, macroscopic investigation of a gastric mucosa demonstrated single erosion. Mucous membrane of a stomach is not visually changed. Microscopic examination of the gastric mucosa had been shown superficial defects on the epithelium. In the glandular part was determined moderate lymphocytic infiltration of the stroma with a mixture of eosinophils. Glandular cells were increased in a size. Gap of the glands was dilated.

In a duodenum mucosa the macro- and microscopic changes were absent.

After the second stage of experiment while macroscopic examination of the stomach was carried out, multiple erosions of the mucous membrane on a background of hyperemia had been shown. Microscopic examination of the gastric mucosa demonstrated superficial defects of the epithelium. Gap of the glands was enlarged, glandular cells were increased. In the cells of the surface epithelium of a stomach was revealed a severe parakeratosis. Stratification of the epithelial layers was disturbed. Vacuolization of the basal and thorny layers in a stomach epithelium was detected, which had been shown the infringement of intracellular contacts in a germinative area. In a border of the epidermal and glandular parts of the stomach was a defined

phenomenon of fibrosis in the stroma and the dense lymphocyte infiltration, mixed with eosinophils. In duodenum the glandular cells were in a state of apoptosis. In the proximal parts of mucosa had been revealed – desquamation of a glandular epithelium, light superficial erosions in the proximal villi, which were covered with a large amount of mucus. In a stroma was determined lymphohistiocytosis infiltration.

In the submucosal layer visualized sharply plethoric vessels in a mucosa – stasis in the capillaries, indicating about disruption of the microcirculation.

Conclusions. Experimental reproduction of duodeno-gastric reflux demonstrates significant structural changes in the gingival tissues, mucous membrane of an esophagus, stomach and duodenum. In the epithelial layer of gingiva and esophagus was observed infringement of cells differentiation. In the stroma was shown fibrosis of a papillary layer, microcirculation disorders. In a gastric mucosa was found the multiple erosions, glandular cells were increased. In a stomach epithelium was demonstrated vacuolization. In a stroma were revealed fibrosis and the lymphocyte - eosinophils infiltration. In the duodenum was determined desquamation of a glandular epithelium. On a background of microvascular disorders, in the stroma was observed infiltration with lymphocytes, histiocytes and plasmocytes.

The conducted experiment demonstrates a role of functional disorders in the pathogenesis of combined pathology of the upper gastrointestinal tract.

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