

SECTION OF MORPHOLOGY СЕКЦІЯ МОРФОЛОГІЇ

EFFECT OF ACUTE IMMOBILIZATION STRESS ON THE MUCOUS MEMBRANE OF THE MAIN AND SEGMENTAL BRONCHI OF RATS

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Relevance: The problem of stress continues to be a topical issue for modern medical science, despite its long study. Numerous models of stress reproduction and various laboratory animals are widely used to study the effects of stress reactions on a living organism.

Aim of the results: Study of the effect of acute immobilization stress on the mucous membrane of the partial and segmental bronchi of rats caused by fixation of the cervical fold of rats.

Methods and Materials: Based on bioethical standards, the study was performed on 10 adult male white rats. I (control) group consisted of 5 intact animals, II (experimental) group consisted of 5 rats that underwent acute immobilization stress. The acute stress model was reproduced by fixation of rats with an atraumatic clamp for six hours on the neck fold. Euthanasia of animals was performed under intraperitoneal thiopental-sodium anesthesia. For histological examination bronchial micropreparations were stained with hematoxylin and eosin.

Results: The mucous membrane of the main and segmental bronchi of rats is lined with a simple ciliated pseudostratified epithelium, which consists of polymorphic epitheliocytes with different functional purposes. The nuclei of these cells form several rows. Among the epitheliocytes are ciliated, goblet, endocrine and basal cells. The surfaces of the ciliated epitheliocytes, facing the lumen of the bronchus, have flashing cilia. Goblet cells are located between the ciliated cells and perform a secretory function. Neuroendocrine cells are rare and alone, with small optically dense granules in their cytoplasm. Basal cells that have retained the ability to mitosis are located in the basal layer. Under the influence of acute immobilization stress in the mucous membrane of the partial and segmental bronchi of rats there are significant destructive changes, which are manifested by loss of integrity of the epithelial layer, destruction of intercellular contacts of epitheliocytes, vacuolization of their cytoplasm. Erythrocytes and cellular detritus were determined in the lumens of the bronchi. In the connective tissue of its lamina propria showed signs of hyperhydration - optically light amorphous substance prevailed over the fibrous and cellular components.

Conclusions: Thus, acute immobilization stress caused by fixation of rats by the cervical fold causes significant destructive changes in the mucous membrane of the partial and segmental bronchi of experimental animals.

Keywords: Stress, rats, morphology, bronchial mucosa.

COMPARATIVE ANATOMY OF RAT AND HUMAN STOMACH IN THE EXPERIMENT

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Background. In experimental medicine, albino rats are most often used as models for the research studies, since the anatomy and physiology of their body is similar to the human one. At the same time, the study of the specific features of the structure of the internal organs of rats is necessary to update current morphological information about the possibility of studying the course and modeling some pathological conditions.

Purpose. The paper was aimed at the study of some anatomical features of the stomach structure of albino rats.

Methods and Material. The study was carried out on 30 albino rats, half of which were on a daily fast before vivisection, and the others were sacrificed after morning feeding. After euthanasia, the stomachs with the distal esophagus were removed and fixed in 10% neutral formalin solution. Subsequently, the organs of the gastrointestinal tract were filled with air, saline and self-hardening plastic (Latacryn-I-S) through the esophagus, and then subjected to acid corrosion to obtain casts of the stomach.

Results. The shape of the stomach of albino rats is a diminished copy of the human stomach, but, at the same time, it has distinct signs of species specificity. When filling the stomach with air and saline through the esophagus, the volumetric ratios depend on the degree of filling: the moderate one - equalization of the sizes of the two regions of the stomach, while with a slight excess of pressure, a greater extension of the proventriculus occurs; when the stomach is filled with self-hardening plastic, the gastric cavity increases due to the extension of its non-glandular region, and on the surface of the obtained plastic casts, a girdle protrusion from the side of the proventriculus is clearly visible, which corresponds to the crest that is the border between its two regions. Given this, we believe that the glandular part of the stomach should be considered the esophageal part of the stomach, and not the proventriculus.

Conclusion. In the stomach, three parts can be distinguished: 1-fundal; 2-gastric and 3-pyloric. Moreover, despite the presence of a delimiting border, the gastric cavity is common - there is no pronounced border in it, which is confirmed by the obtained plastic casts.

Keywords: albino rats, stomach, fundal part, gastric part, digestion.

OMOHYOID MUSCLE ANATOMICAL VARIABILITY IN FETAL PERIOD OF HUMAN ONTOGENESIS

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Topicality. Omohyoid muscle (OH) is a surgical landmark, used for detecting internal jugular vein (Gianesini S, et al.; 2014), lymph node metastasis (Maniakas A; 2021), diagnosing of malignant tumors and cysts of neck in children (Abdulkader F; 2021). Because of OH's significant role in neck topography and surgery, as well as proximity to branchial plexus, we have investigated its morphological peculiarities during fetal period of human intrauterine development (IUD).

Aim. The aim of research was to investigate topography and peculiarities of OH in human fetuses during the fetal stage of IUD.

Material and methods. We have examined 12 specimens of human fetuses (4-8 months of IUD; 81,0-370,0 mm of parieto-coccygeal length (PCL) by the means of morphological methods (macroscopy under control of the magnifying glass; layer by layer dissection of anterior and lateral neck regions, accompanied by photographing; microscopy of OH portions). Material was obtained from Chernivtsi Regional Pathologists Office. Research was permitted by BSMU Ethic Committee and conducted in accordance with CH GCP (1996) and The Declaration of Helsinki (1964-2008).

Results. In human fetus of 5th month IUD (180,0 mm PCL) OH was represented by a two-portion muscle with an oblique course; inferior belly started from the superior portion of the scapula, directed superiorly over scalene muscle within lateral triangle of neck. Superior belly of OH was attached to the inferior edge of the body and larger horns of hyoid bone. Attachment point was merging with thyrohyoid muscle. In one case (200,0 mm PCL fetus, 6th month of IUD) we didn't observe any presence of tendon in the intermediate connecting portion; instead, the inferior belly was continued by thin portion, represented by muscular tissue in the middle 1/3 and into the superior belly, respectively. In this case OH didn't create an angle within the lateral cervical region, because of a relatively straight and oblique course. In 260,0 mm PCL fetus (7th month of IUD) attachment of right and left OH was asymmetrical towards hyoid bone bilaterally, accompanied by asymmetrical course of sternohyoid muscles. In rest of the cases (9 specimens of human fetuses; 185,0-370,0 mm PCL) OH begins by inferior belly within supraclavicular part of posterior cervical triangle from upper border of scapula and adjoining part of supra scapular ligament, goes obliquely superior towards hyoid bone, overlaying internal jugular vein and attaches to lower border of hyoid bone body, close to sternohyoid within anterior cervical triangle.

Conclusions. We may conclude that the fetal period of human intrauterine development is characterized by moderate anatomical variability of omohyoid morphology (attachment, course, histological composition). This should be concerned in practical surgery, especially while using myocutaneous muscular reconstruction flaps to prevent possible complications.

Key words: prenatal development, neck region, omohyoid muscle, human.