FEATURES OF MORPHOLOGICAL CHANGES IN THE INTRAMURAL PART OF THE URETER UNDER THE INFLUENCE OF EXPERIMENTAL HYPOTHYROIDISM

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Relevance

It is known that hypothyroidism affects the functional state of all organs and tissues of the body. It has been noted in the literature that in children with hypothyroidism, clinical symptoms such as lagging in the development of psychomotor systems, low mobility, and significant weight gain are observed. Based on the results of experimental studies, the available literature presents data on the study of the morphogenesis of the urinary tract on a hypothyroidism model, functional morphometry of the urinary system, histological reconstruction of the intramural part of the urinary tract and the dynamics of morphological changes in their structures, as well as a comparative analysis of the condition in hypothyroidism with the condition obtained as a result of morphological correction.

Purpose:

To study the dynamics of morphological development of the anatomical structures of the ureter wall under the influence of experimental hypothyroidism in the early stages of postnatal ontogenesis.

Object and methods of research:

In the experiment, 24 white laboratory non-breeding sexually mature rats were administered orally with thyrostatic mercazolium at a dose of 0.3 mg/kg of body weight from the first days of pregnancy, and 72 offspring were observed on the 14th, 30th, 45th, and 60th days of postnatal development. During these periods, differences were observed in their external characteristics, physical activity, and the uniqueness of formation processes. According to the research objectives, the animals of the experimental group were divided into 2 groups. The control group of animals consisted of children born to female rats with physiological pregnancy in a general vivarium regime.

When conducting experiments, the application of experiments on animals did not go beyond the framework of regulatory legal acts and fully complied with the World Convention (On the Protection of Vertebrate Animals, 1997). The rats were placed in vivarium conditions in special metal cages, each containing no more than 5 animals. Experiments were conducted during the spring-autumn seasons. Each animal was fed within the established normative diet.

Adult rats were kept in separate cells from the 6th-8th day of pregnancy. For morphological studies, the animals were decapitated using chloroform ether anesthesia.

For histological examination, the right and left ureters of the animals were isolated. Ureter and bladder samples were fixed in a 10% formalin solution and then placed in paraffin. A histological section 5 μm thick was prepared and stained with hematoxylin-eosin, Van Gieson, and toluidine blue.

According to the results of histological examination in the 1st group (0-14 days), the tissue elements of the ureter wall consist of mucous, muscular, and adventitial membranes, which are not clearly separated from each other. In newborn rats up to 14 days of age, the mucosal relief is smooth, and in 30- and 60-day-old rats, folds of the epithelial covering are observed, growing into the tubes. In the last period of observation, the mucous membrane near the kidneys bends longitudinally, forming layers, but towards the vesicle, these layers smooth out. The muscular tissue of the ureter wall is relatively well-developed in group II. When stained according to Van Gieson, muscle fragments (transverse, longitudinal, and oblique) are found between the loose connective tissue, located in different directions. In different serial cuts of the same section, the muscle lobes are cut differently - this indicates their arrangement in a spiral direction. The amount of muscle tissue in the muscle layer is significantly greater than in the connective tissue.

Conclusion:

In the early stages of postnatal ontogenesis, the ureters undergo serious changes in the processes of functioning and development of the body, manifested in the restoration of the internal structure during the age-related development of the tissues of the ureter walls and characterized by a certain direction and dynamics as a result of exo- and endogenous influences. If at the early stage (14 days) under the influence of hypothyroidism, functional changes are observed in the intramural part of the ureter, then on the 30th day, morphological disorders of the structure and vascular-muscular system are revealed, and in the 60th-day generation - atrophy and fibrosis, which cannot be restored.