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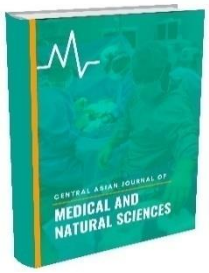

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STRUCTURE OF THE TESTES OF WHITE OUTBRED RATS

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Abstract: Testes are sensitive organs to various pathologies, therefore histopathological examination of testes is important in assessing spermatogenesis and testicular function, both in clinical practice and laboratory experiments. The article provides information about the normal structure of the testes in white rats at puberty.

Key words: testes, morphology, seminiferous tubules

Infertility is a global problem that affects about 15% of married couples, which is approximately 48.5 million couples worldwide. According to statistics, male factor is the cause of infertility in 50% of cases. The causes of male infertility are varied and can be either congenital or acquired. Factors that have a negative impact on male fertility are described - obesity, smoking and exposure to heat and infectious diseases of the genital organs [4].

Male fertility requires the production of large numbers of normal and mature sperm by the testes through a complex process called spermatogenesis [5]. With aging, the number of mature sperm in the seminiferous tubules decreases. In general, it can be argued that aging affects the process of spermatogenesis and fertility [2].

The main mass of the testis is formed by round or elliptical seminiferous tubules [1]. In the study of the seminiferous epithelium, Sertoli cells (supporting cells) lying on the basement membrane of the seminiferous tubules were identified. [3].

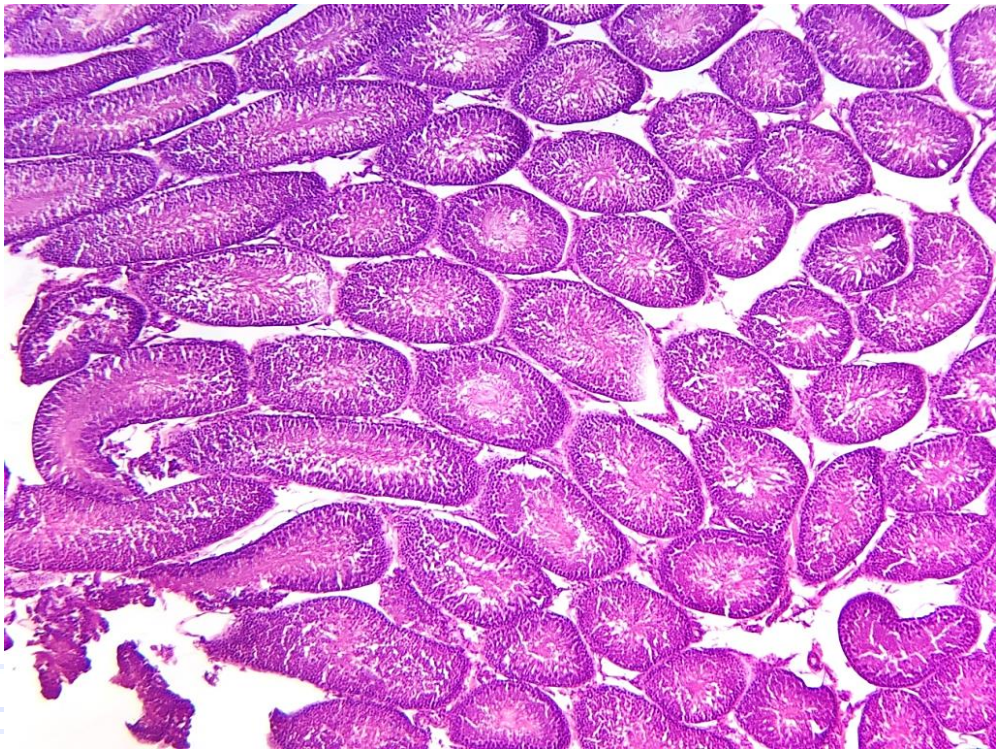
Goal of the research is learning the normal structure of the testes in white rats at puberty.

Material and methods. 50 3-month-old white male rats kept in standard vivarium conditions were selected for the experiment. They were quarantined for 2 weeks before the experiment and transferred to other rooms after exclusion of various somatic, infectious diseases. The rats were kept under a 12-hour light regime and provided with sufficient water and 3 meals a day.

At the end of the experiment, the rats were euthanized under light ether (chloroform) anesthesia on an empty stomach. For morphological examination, spermatozoa were isolated, weighed, fixed in 10% neutral formalin, dehydrated in increasing concentrations of alcohol, and embedded in paraffin.

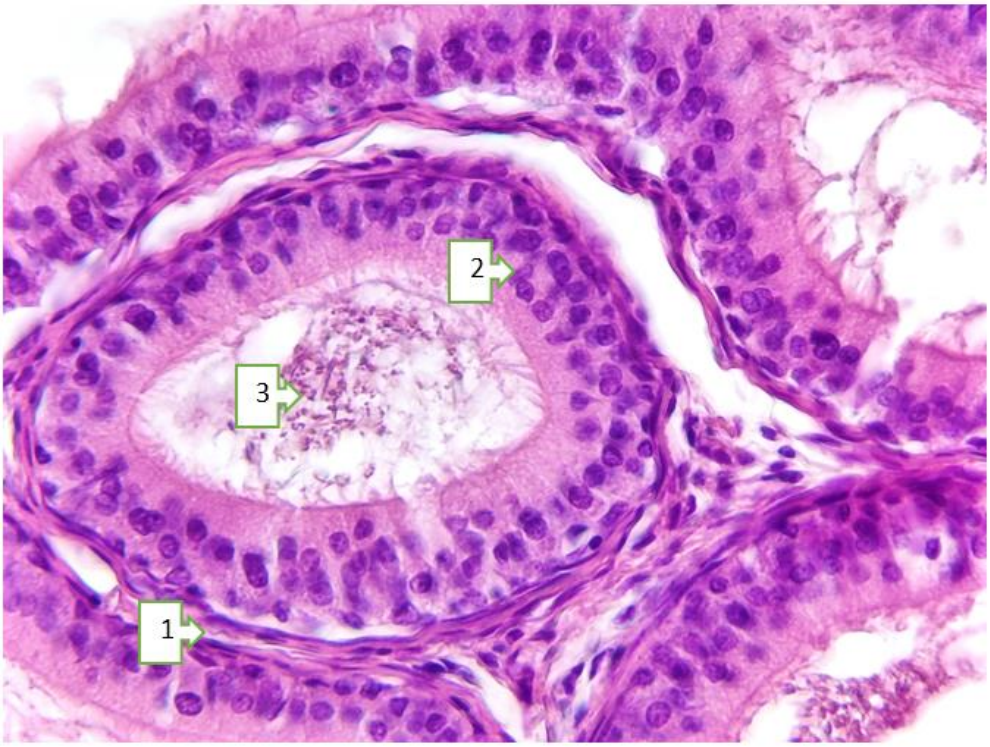
Sections with a thickness of 5-7 μm were prepared on a microtome, deparaffinized in xylene, stained with hematoxylin and eosin, and studied using morphological and morphometric methods.

Results of the research. One of the unique features of the normal structure of seminiferous tubules and seminiferous tubules of the control group of rats is characterized by the fact that Leydig cells, which are among the many interstitial cells between the seminiferous tubules of the testes, form a hematotesticular barrier and cannot pass any toxic substances through this barrier. Interstitial cells also include fibroblasts, histiocytes and other types of cells, which are important for maintaining fluid balance in the intertubular space. The relative arrangement of histiocytes, fibroblasts and pericytic cells with Leydig cells around the blood vessel plays an important role in ensuring the normal morphofunctional state of the convoluted tubules (pic. 1).



Pic 1. Seminiferous tubules of healthy rats. The histioarchitectonics of most tubules is preserved, and intertubular spaces are almost identical in appearance. G.E. Size 4x10.

The convoluted tubules are also composed of transitory tubules, which produce spermatogenic cells and transfer them to the next ejaculatory duct. The wall of convoluted tubules consists of structures of basal layer, myoid cells, Sertoli cells and spermatogenic cells of various stages. Sertoli cells with wide cytoplasm and light nuclei are located on the inner surface of the basal layer of curved tubules. Different arrangement of spermatogonial cells along the perimeter of these cell membranes creates a unique cytoarchitectonic picture. Through these changes, the Sertoli cells ensure that the process of spermatogenesis is controlled and stimulated (pic. 2).



Pic. 2. Histological appearance of the convoluted tubule of healthy rats. The relief of the basal layer is clear and smooth (1), the hypercellularity of spermatogenic cells has the same appearance (2), spermatozoid cells are identified in the tube cavity (3). G.E. The size is 40x10.

Spermatogenous cells are arranged in different stages, progressing towards the center of the tubule cavity with development and differentiation, ending with spermatogenic cells. This collection of fully developed spermatozoid cells, as a result of the tectonic contraction of the myoid cells in the wall of the tube, moves towards the tubes of the next order and produces the ejaculate. As this gamete-rich ejaculate moves through the successive tubes, the testicles move toward the tube. The peculiarity of the wall of the seminiferous tubules is that there are ciliated and secretory epithelial cells that produce a fluid rich in various organic substances for the movement of spermatozoa. Finally, passing into the general urinary tract, it is enriched with prostatic fluid and is excreted in the form of ejaculate.

Conclusion. Most of the tubules of the seminiferous tubules form a variable mixture with the nutrient fluid produced by the spermatozoids and secretory cells, and in the microscopic examination, it has a dark pink color and occupies most of the space. This ensures that the germ cells can reach the next direction without being damaged. A uniform distribution of ejaculate is determined in most of the cavities of the testicular system.

The interstitial cells are evenly distributed, and the interstitial cells are equally spaced. Testicular hyperfibrous parades are uniform in thickness, blood vessels are moderately full, and interstitial edema is not detected. In most cases, the histioarchitectonics is unchanged, and the angioarchitectonics of the blood vessels is determined to be the same.

References:

1. Dudenkova N. A., Shubina O. S. Morphological features of the structure of the testes of male white rats during the period of postnatal ontogenesis // Doctor-graduate student. 2015. No. 5 (72). pp. 31-40

2. Holstein AF, Schulze W, Davidoff M. Understanding spermatogenesis is a prerequisite for treatment. Reprod Biol Endocrin. 2003;1:107.

3. Hussein SM, El-Fadaly AB, Metawea AG, Khaled BEA. Aging changes of the testis in albino rat: light, electron microscopic, morphometric, immunohistochemical and biochemical study. Folia Morphol (Warsz). 2020;79(3):503-515. doi: 10.5603/FM.a2019.0102.

4. Lebedev G.S., Golubev N.A., Shaderkin I.A., Shaderkina V.A., Apolikhin O.I., Sivkov A.V., & Komarova V.A. (2019). Male infertility in the Russian Federation: statistical data for 2000-2018. Experimental and Clinical Urology, (4), 4-12.

5. Lin Q, Sirotkin A, Skoultchi AI. Normal spermatogenesis in mice lacking the testis-specific linker histone H1t. Mol Cell Biol. 2000;20:2122–2128.