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ADRENAL MORPHOLOGY IN HYPERCHOLESTEROLEMIA UNDER THE INFLUENCE OF DIPSACOSID

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Resume: *The article studied the morphology of the adrenal glands under the administration of a 10% aqueous solution of dipsacoside under experimental atherosclerosis. The data obtained testify to phase changes in the morphofunctional status of the adrenal gland. In the initial period of the experiment, the lipid infiltration has a focal character with the predominance of spongiocytes with a fine-cuolored cytoplasm. With the lengthening of the experimental period coarse-drop obesity of the cells of the bundle and reticular zones is observed.*

Key words: *experimental hypercholesterolemia, adrenal glands, dipsacoside.*

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МОРФОЛОГИЯ НАДПОЧЕЧНИКОВ ПРИ ГИПЕРХОЛЕСТЕРИНЕМИИ ПОД ВЛИЯНИЕМ ДИПСАКОЗИДА

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Резюме: *В статье изучена морфология надпочечников при приеме 10% водного раствора дипсакозида в условиях экспериментального атеросклероза. Полученные данные свидетельствуют о фазовых изменениях морфофункционального статуса надпочечников, в начальном сроке эксперимента инфильтрация липидами носит очаговый характер с преобладанием спонгиоцитов с мелковакуолизированной цитоплазмой. По мере удлинения сроков опыта наблюдается крупнокапельное ожирение клеток пучковой и сетчатой зон.*

Обнаруженная трансформация может свидетельствовать о компенсаторной реакции организма на развитие атеросклеротического процесса

Ключевые слова: *экспериментальная гиперхолестеринемия, надпочечники, дипсакозид.*

RELEVANCE

Given the involvement of lipids in the pathogenesis of atherosclerosis, the use of lipid-lowering substances reduces the risk of atherosclerosis and its complications [1, 2, 3]. The use of herbal medicines to treat these diseases is perspective [4, 5, 6, 7]. The purpose of the study was to examine the morphology of the adrenal glands under the influence of dipsakozide in experimental atherosclerosis.

Materials and Methods. The experiment was carried out on 70 healthy full-grown male rabbits of the same age, kept in the same conditions. The weight of the animals ranged from 2,0 to 2.5 kg. In the 1-series - 30 rabbits, were fed with cholesterol, distributed according to the duration of the experiment: 30 days - 10 rabbits, 60 days - 10 rabbits, 90 days - 10 rabbits. Animals of the 2-series - 30 rabbits, received cholesterol with grated carrots and an hour later introduction of 10% aqueous solution of dipsakozide at a rate of 10 mg/kg of body weight in the morning on an empty stomach was carried out. Intact animals (series 3) - 10 rabbits - served as controls for these series. After 30, 60 and 90 days, the adrenal glands of experimental animals were studied. The preparations were stained with hematoxylin and eosin. The validity of this approach has been confirmed by numerous studies [8, 9].

Results and discussion. 30 days after the start of feeding the experimental animals with cholesterol macroscopically, the adrenal glands are oval, dense in consistency, the cortical substance is yellow, the medulla is brown. The glomerular zone (GZ) consists of rounded cells of small size, located in groups in the cells. The cytoplasm of the cells is transparent, the nuclei are intensively stained with hematoxylin. 60 days after the start of feeding experimental animals with cholesterol can be noticed that adrenal glands are oval-shaped with dense consistency, yellow cortical substance and brown medulla.

GZ consists of rounded cells of small size, located in groups in the cells, between them there are thin connective tissue layers. The cytoplasm of the cells is transparent, the nuclei are intensively stained with hematoxylin. There are areas with large vacuolated cytoplasm. Separate strands of cells with homogeneous cytoplasm, devoid of vacuoles, are found in patches. In the third series, i.e., 90 days after the start of feeding the experimental animals with cholesterol, macroscopically the adrenal glands are oval in shape, dense in consistency, the cortical substance is yellow, the medulla is brown, moderately plethoric. The glomerular zone consists of rounded cells of large size, polygonal shape, located in groups in the cells, between them there are thin connective tissue layers. The cytoplasm of the cells is light, coarsely vacuolated, the nuclei are intensively stained with hematoxylin.

In group 1 (30 days) of the second series of experimental animals, the adrenal glands are macroscopically oval in shape, dense in consistency, flattened, on sections the cortical layer is yellow, the medulla is brown. GZ is located under the capsule in the form of a thin strip of uneven width and consists of clusters of rounded cell groups with a centrally located nucleus and a narrow rim of the cytoplasm, between which there are thin layers of fibrous connective tissue. Fasciculate zone (FZ) of the adrenal cortex in this group of observations consists of long strands of small cells of a round or polygonal shape with a centrally located nucleus and a cytoplasmic rim, thin layers of fibrous connective tissue are revealed between them. Attention is drawn to the presence of dystrophically altered cells in the FZ- vacuolization of the cytoplasm of individual cells with a displacement of the cell nucleus to the periphery, and such dystrophically altered cells are found in the middle and lower parts of this zone. The Reticular zone (RZ) of the adrenal cortex is built from small strands of cells having a rounded shape, the cytoplasm of the latter is finely vacuolized, or has a uniform structure of light pink color. Small cords of these cells go deep into the adrenal medulla.

In the second group (60 days) of the second series of experimental animals macroscopically adrenal glands without significant differences from those in the first group. GZ consists of groups of small rounded cells with light cytoplasm, finely vacuolized in areas. The fasciculate zone consists of small rounded or polygonal cells with a centrally located nucleus, the cells form strands delimited by thin layers of delicate fibrous connective tissue with single collapsed vessels. The cytoplasm of some cells is vacuolated, single cells are in a state of necrosis. In the reticular zone, consisting of small strands of rounded cells with light, areas of finely vacuolated cytoplasm.

The adrenal glands of the third group of the second series of observations (90 days) are macroscopically rounded in shape with a dense consistency, the cortical substance is yellow, the medulla is light brown. The tissue of the adrenal glands in this group of observations is moderately plethoric. In the study of histological preparations, the development of dystrophic changes in the cytoplasm of the cells of this zone in the form of focal vacuolization of the cytoplasm of the cells of this zone and necrosis of single cells draw attention to FZ in the study of histological preparations.

The adrenal glands of intact animals (3-series) are macroscopically oval in shape with a dense consistency, the cortex is yellow, and the medulla is light brown. GZ cells are located in cells formed by a thin connective tissue stroma in the form of glomerular nests and clusters. The cells of this zone are predominantly round in shape, small in size, the cytoplasm is transparent, moderately stained, in some fields of view the cytoplasm of GZ cells is slightly vacuolated. The FZ of the adrenal glands is the widest. It is formed by large cells of a round, polygonal shape. The strands of cells are arranged in parallel and are delimited from each other by thin connective tissue layers. RZ cells have a rounded shape, their cytoplasm is finely vacuolated, homogeneous, light pink, thin-walled vessels are located between their strands.

Conclusions: Thus, the development of experimental atherosclerosis in rabbits (difference from the series treated with dipsacoside) is accompanied by phase morphological changes in the adrenal glands, from the beginning lipid infiltration with focal pattern with a predominance of spongiocytes with small vacuolized cytoplasm. As the duration of the experiment is extended, large-drop obesity of the cells of the fascicular and reticular zones, the phenomena of necrobiosis and cell necrosis are observed. The detected transformation may indicate a compensatory response of the body to the development of the atherosclerotic process [10, 11, 12, 13].

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