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# ИЗМЕНЕНИЕ НАДПОЧЕЧНИКОВ ПРИ ГИПЕРХОЛЕСТЕРИНЕМИИ ПОД ВЛИЯНИЕМ ДИПСАКОЗИДА

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# ADRENAL CHANGES IN HYPERCHOLESTEROLEMIA UNDER THE INFLUENCE OF DIPSACOSIDE

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**Резюме.** Изучены морфометрические показатели надпочечников при приеме 10% водного раствора дипсакозида при экспериментальном атеросклерозе. Под влиянием дипсакозида происходит увеличение массы, ширины надпочечников всех зон, индекса Вальдеса, т.е. происходит прогрессивная трансформация показателей, свидетельствующая о повышении морфофункционального состояния коры надпочечников.

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

**Resume.** The morphometric parameters of the adrenal glands were studied when taking a 10% aqueous solution of dipsacozid in experimental atherosclerosis. Under the influence of dipsaccosid, there is an increase in the mass, width of the adrenal glands of all zones, the Valdes index, i.e. there is a progressive transformation of indicators and the functional state of the adrenal cortex.

**Keywords:** experimental hypercholesterolemia, adrenal glands, dipsacosid.

**Actuality:** The problem of atherosclerosis remains relevant today, since, being the main cause of coronary heart disease, it is the leading cause of death in the population worldwide [1, 2, 3]. The use of herbal medicines for the treatment of these diseases is very promising [4, 5, 6, 7].

**Purpose of the study:** study of morphometric parameters of the adrenal glands under the influence of dipsacoside in experimental atherosclerosis**.**

**Materials and methods.** The study was performed on 70 healthy mature male rabbits of the same age, kept under the same conditions. The weight of the animals ranged from 2.0-2.5 kg. I-series - 30 rabbits fed with cholesterol were distributed according to the duration of the experiment: 30 days - 10 rabbits, 60 days - 10 rabbits, 90 days - 10 rabbits. II-series-30 rabbits also divided by the duration of the experiment: 30 days - 10 rabbits, 60 days - 10 rabbits, 90 days - 10 rabbits. Animals of this series received cholesterol in the morning with grated carrots on an empty stomach, and an hour later they were injected with a 10% aqueous solution of dipsacoside at a rate of 10 mg/kg of body weight. Intact animals (series III) - 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 adrenal zones were measured with an eyepiece micrometer on

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sections stained with hematoxylin and eosin, after which the weighted average width of each zone was calculated. The Valdes index (VI) was calculated based on changes in the weight of the adrenal glands and their zonal structure, according to the formula. The validity of using such a morphometric approach has been confirmed by numerous studies [8, 9].

**Results and discussion.** 30 days after the start of feeding experimental animals with cholesterol, the weight of one adrenal gland amounted 218 g, with fluctuations in the weight of the right adrenal gland within 190-343 mg, the left 181-444 mg. The weight of the glomerular zone (GZ) of the adrenal cortex was 43.1±4.7 mg, the average width was 212.4 μm. The weight of the fascicular zone (FZ) of the cortical layer of the adrenal glands was 100.7 ± 8.3 mg, its average width was 1872 μm. The weight of the reticular zone (RZ) of the cortical layer of the adrenal glands was 67.1±6.5 mg, the average width is 511 μm. VI in this observation period represented - 5.6.

60 days after the start of feeding experimental animals with cholesterol, the weight of one adrenal gland amounted 239.1 mg, with fluctuations in the weight of the right adrenal gland within 194-310 mg, the left 162-315 mg. The weight of the GZ of the adrenal cortex in this group of observations was 46.1±3.6 mg, the average width was 186 μm. The weight of the FZ of the adrenal cortex was 79.9±2.2 mg, its average width was 2247 μm. The weight of the RZ of the cortical layer of the adrenal glands of this group was 106.2±10.9 mg, the average width was 534 μm. VI in this observation period represented - 7.4

In group 1 (30 days) of the second series of experimental animals, the weight of the adrenal glands varied: the right - from 158 to 350 mg; left - from 150 to 371 mg; the average weight of one adrenal gland indicated 233.4 mg. The weight of the GZ of the adrenal cortex in this group of observations was 53.5±5.5 mg, the average width was 210.1 microns. The weight of the FZ of the cortical layer of the adrenal glands amounted 135±17.5 mg, the average width was 1575 microns. The weight of the RZ in this group indicated 42.1 ± 7.1 mg, the average width is 601 microns. VI represented - 6.

In the second group (60 days) of the second series of experimental animals, the weight of the adrenal glands of rabbits in this group varied: the right one from 220 to 306 mg, the left one from 260 to 320 mg, the average weight of one adrenal gland was 311.2 mg. The weight of the GZ was 47.6 ± 4.7 microns, the average width was 200.0 microns. The weight of the FZ was 124.4±18.08 mg, the average width amounted 1740 microns. The weight of the RZ in this group was 104.8 ± 4.9 mg, the average width is 607.0 microns. VI represented 6.5.

The weight of the adrenal glands of the third group of the second series of observations (90 days) varied, the right one from 237 to 425 mg, the left one from 286 to 500 mg, the average weight of one adrenal gland indicated 429.3 mg. The weight of the GZ of the adrenal glands of this group was 70.5 ± 11.5 mg, the average width - 192.4 mg. The weight of the FZ in this group of observations was 208.5 ± 43.2 mg, the average width amounted 1798 microns. The weight of the adrenal glands in this group was 142.5±23.5 microns, the average width - 500 microns. VI-11.6.

The study of the adrenal glands of intact animals (3-series) showed fluctuations in the mass of the right adrenal gland in the range from 108 to 170 mg, the left from 105 to 170 mg. The average weight of one adrenal gland indicated 139 mg.

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The weight of the GZ of the adrenal cortex in the control group was 23.4±1.01 mg, the average width - 220 microns. The weight of the FZ of the adrenal cortex in the control group indicated 57.3 ± 3, the average width - 1505 microns. The weight of the RZ of the cortical layer of the adrenal glands of this group was 31.2±2.5 mg, the average width represented 637 microns. IV - 2.4.

**Conclusions:** thus, the development of experimental atherosclerosis in rabbits is accompanied by phase morphological changes in the adrenal glands, at the beginning of the experiment, signs of high morphofunctional activity in the adrenal glands are determined: hypertrophy, an increase in the width of the zones, especially the fascicular zone (FZ). As the duration of the experiment is lengthened, a decrease in morphofunctional activity in the adrenal glands is observed in the form of large-drop obesity of the cells of the fascicular and reticular zones, the phenomenon of necrobiosis and cell necrosis are observed. Under the influence of dipsacoside in conditions of experimental hypercholesterolemia, there is an increase in the weight of all zones of the adrenal glands, the volume of nuclei, Valdes Index (VI), i.e. there is a progressive increase in indicators and an increase in the morphofunctional state of the adrenal cortex. The detected transformation may indicate a compensatory reaction of the body to the development of the atherosclerotic process [10].

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