MORPHOMETRIC CHANGES IN THE KIDNEYS AS A RESULT OF HOUSEHOLD GAS POISONING ON THE BACKGROUND OF CHRONIC ALCOHOLISM

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Abstract: *This thesis presents data on the toxic effects of chronic alcoholism and household gas on the morphometric characteristics of the kidneys of 3-month-old white crossbred rats.*

Keywords: *renal capsule, renal corpuscles, Shumlyansky Bowman's capsule, convoluted tubules, renal cortex and medulla.*

Relevance: Chronic alcoholism and poisoning with household gas are factors that affect the physical and mental state of a person. First of all, among toxicological patients, constant heavy alcohol consumption and chronic poisoning with household gas lead to the deterioration of the functional systems of most organs and systems of the body, in particular, the kidneys among the urinary organs, and ultimately to the development of the disease.

Globally, about 3 million deaths are recorded annually due to chronic alcoholism and household gas poisoning. Against the background of chronic alcoholism, household gas poisoning is one of the leading causes of premature death among patients worldwide, and alcohol consumption is usually the cause of every fourth death among people aged 20-24. Numerous studies have confirmed the negative effects of ethanol and household gas on the human body, including parenchymal organs, and structural changes in various organs and tissues under the influence of alcohol and gas have been described. Experimental studies have been conducted to determine the relationship between chronic alcoholism and household

gas poisoning, but the study of the morphological and functional state of the kidneys in this condition in experimental studies is still insufficient. Therefore, this condition requires a more in-depth morphological study.

Materials and methods: 10 three-month-old white mice of both sexes kept in vivarium conditions were used for the study. In the study, white mice were poisoned with alcohol and household gas. Then, at the end of the studies, all animals were anesthetized under light isoflurane ether anesthesia, the abdominal cavity was opened, and the kidneys were removed. For subsequent histological examination of the removed kidneys, the kidneys were placed in 10% neutral formalin solution. Kidney preparations were prepared using standard histological methods. These preparations were subsequently stained with hematoxylin-eosin and van Gieson stains. Microscopy of the preparations was performed under a trinocular microscope with a magnification of × 60, × 80, and corresponding photographs were taken, and all the results obtained were statistically analyzed and the sample average parameters were calculated.

Results and Discussion: No macroscopically obvious pathological changes were observed in the kidneys of 3-month-old white rats of the study group.

The dynamics of organometric parameters of the kidneys of 3-month-old white rats of the study group after 30 days of chronic alcoholism and poisoning with household gas were as follows: absolute weight - from 626.86 mg to 878.28 mg, average - 760.48±26.76 mg; length - from 18.43 mm to 20.21 mm, average - 19.78±0.57 mm; width - from 6.64 mm to 8.94 mm, average - 7.87±0.58 mm; thickness - from 6.43 mm to 8.64 mm, average - 7.7±0.21 mm; volume - from 612.67 mm3 to 803.4 mm3, average - 716.56±37.22 mm3.

From a histological point of view, 30 days after chronic alcoholism and poisoning with household gas, the following changes occurred in the morphological and morphometric parameters of the renal cortex of rats: the area of

the renal corpuscles increased from 1032.65 μm2 to 2625.46 μm2, with an average of 2460.19±133.75 μm2; the area of the vascular bundles increased from 1668.88 μm2 to 2365.14 μm2, with an average of 2097.56±84.54 μm2; the area of the capsule cavity increased from 325.6 μm2 to 424.62 μm2, with an average of 368.94±12.66 μm2.

The diameter of the proximal convoluted tubules was from 32.54 μm to 40.1 μm, on average - 35.51±8.87 μm, and the diameter of the tubule cavity was from 29.13 μm to 33.27 μm, on average - 31.01±6.86 μm.

The diameter of the distal convoluted tubules was from 28.2 to 31.8 μm, on average - 30.48±5.29 μm, and the diameter of the tubular cavity was from 19.21 to 24.8 μm, on average - 20.66±1.26 μm.

Thus, histological examination showed that there were clearly visible changes in the structure and morphometric parameters of the kidneys of animals with chronic alcoholism and poisoning with household gas.

Conclusion: Poisoning with household gas against the background of chronic alcoholism caused a shift in morphometric parameters in 3-month-old rats.

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