

Analysis of organometric data of myocardium in young rats at water intoxication

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Introduction. Organometry gives the possibility to determine and compare the mass and the area of each chamber of the heart.

Hypoosmolar overhydration often occurs when enteral introduction of a large quantity of water, acute renal failure, Parhon syndrome, eclampsia [2].

The aim of this work was to study the organometric parameters of the heart in young rats at hypoosmolar overhydration.

Materials and Methods.

We used 12 three-month white laboratory male rats which were divided into experimental and control series. The experimental series included 6 animals, which received 10 ml distilled water through a tube three times a day and ate boiled demineralized food. To prevent physiological maintain of water homeostasis we injected synthetic analogue of antidiuretic hormone (vasopressin) "Mynyrin» (Ferring) twice daily at a dose of 0.01 mg. The severe overhydration was achieved on 15th day [3]. The control group consisted of 6 rats which were injected with "Mynyrin» (Ferring) twice daily at a dose of 0.01 mg, considering the potential effects of vasopressin on the cardiovascular system. Animals received normal drinking water and food.

We determined the net weight of the heart; the weight of both ventricles and atria, Fulton index (the ratio of the mass of the left ventricle with interventricular septum in weight of the right ventricle), ventricular index (the ratio of the mass of the left ventricle in weight of the right ventricle); area of the left and right ventricular endocardial surfaces; planimetric index (the ratio of the area of the left ventricular endocardial surfaces to the area of the right ventricular endocardial surface) [1].

Results and discussion. The net weight of the heart compared to control animals significantly increases by 26,83% ($p < 0,0001$). The weight of left ventricle increases by 28,65% ($p < 0,0001$), right ventricle – by 25,77% ($p < 0,0001$), atria – by

21,98% ($p < 0,0001$). The relative gravity values (Fulton index and ventricular index) do not change during the experiment, indicating a uniform increasing in ventricular mass. The area of endocardial surface of the left ventricle does not change significantly, while the same indicator of the right ventricle increases by 18,05% ($p = 0,0099$). Planimetric index reduces by 8,78% ($p < 0,0001$).

Conclusions. Changes morphometric data of young rats under the influence of hypoosmolar overhydration are characterized by a uniform increase in the mass of all chambers of the heart and the preferential expansion of the cavity of the right ventricle.

References:

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