Materials of Conferences

CHANGES OF LEFT VENTRICLE MYOCARDIUM STRUCTURE OF A RAT'S HYPERTROPHIC HEART INFLUENCED BY HYDRA'S PEPTIDIC MORPHOGEN

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It is given that hydra's peptidic morphogen (HPM) in invertebrates organism is a growth hormone, and its role in mammal's organism is unclear. According to substituted data HPM is a tissue nonspecific regulator, stimulating some functions of organs in health and none. Aim of the research is studying of single dosing of HPM into different layers of rat's hypertrophic myocardium. The research is carried out with 9 Wistar rat-males 180-200 gr. HPM is from peptide synthesis laboratory of Institute of Experimental Cardiology of Russian Cardiology Research-and-Production Complex, IP injected in dose 20 mcg/kg of the body in the volume of 1 ml once after coarctation of aorta surgery. Control animals were injected normal saline solution, containing equimolar mixture of aminoacids. The surgery of dosed 50% abdominal aorta coarctation was carried out under Nembutal narcosis. In 10 days chest was opened, heart was perfused with 2% gluteraldehyde and then taken out. Tissue sheets were cut from the middle third of the left ventricle, fixitaed with 1% osmic acid, dehydrated with graded alcohols and embed in Epon resin. Semifine section, dyed in toluidine blue, was evaluated by 1350 times amplification, using morphometric reticle. Morphometric analysis did not show differences between series of operated animals that got and did not get injection of a mixture of aminoacids. There were determined volume fraction of myocytes Vv(m), connective tissue Vv(ct) and capillary Vv(c), surface of myocytes S (m) and capillary S (c), surface density of myocytes per unit of surface of capillary S(m)/S(c), surface of cardiac myocytes per unit of its volume S (m)/Vv (m), volume of myocytes per volume of capillary Vv (m)/Vv (c), and volume of capillary per volume of connective tissue Vv (c)/Vv (ct). The average value of diameter of myocytes was calculated (μm). PC 1640 "Amstrad" was used for statistical processing. Injection of HPM led to change zone decrease, marked in subendocardial layer and moved to ventricular cavity. With that myocyte vacuolization was decreased, and changed cores and abbreviated myocytes were detected rarer. No signs of structure failure were detected in other myocardium layers. Hydrops of subendocardial layer was less expressed than in control. Other myocardium layers did not show hydrops signs. Resetting of myocyte volume fraction was marked in subendocardial layer when HPM injected. Mocyte surface was accurately decreased in comparison to control when average diameter of myocytes was increased. Content of connective tissue was decreased because of hydrop reduction, capillary apparent density came to N. Surface - volume dataofmyocytes came to normal level. Myocyte surface to capillary surface ratio was at control level. Myocyte volume to capillary volume ratio was decreased. When HPM injected more significant part of myocytes was observed in intramural layer of walls of the heart than in subendocardial layer. Average myocyte diameter did not change. Content of connective tissue was decreased because of tissue hydrop reduction. Capillary surface was comparable with the control one. Volume-surface characteristics of capillary in subendocardial and intramural layers of myocardium showed increased volume of blood flow. In subendocardial layer the HPM injection restored specific to normal balance between volume fraction of myocytes and connective tissue. Myocyte diameter was increased with that which shows their earlier involvement into hypertrophy process. Capillary surface and volume decrease showed their decrease of blood supply level in subepicardial layer. It is followed from the represented data that single HPM injection relieved the development of myocardium hypertrophy in subendocardial layer and in less extent in intramural and subepicardial layers, influencing all tissue components.

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CONCEPTUAL MODEL OF STRESS-INDUCED DYNAMICS ACID-HEMOLYTIC STABILITY OF ERYTHROCYTE

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The problem of the adaptation of living organisms to the continuously changing conditions of their environment, occupies one their visible places in the number of those, at which work the specialists of biomedical profile. As key component in the theory of adaptation comes out the concept of stress, created with G. Selye.

According to the contemporary ideas, stress (in man) – this is the typical pathologic process, at basis of which lies the prevailing in the course of evolution standard unspecific general adaptive reaction of the complete organism to the action of ultrapowerful stimulus or its threat, that is the result of integral interaction of the complex of reciprocal psycho-neuro-endocrine-immune and cellular-tissue factors and