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Amyloidogenesis under experimental neurodegeneration in rats

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Introduction: One of the mechanisms in the pathogenesis of proteinopathy is the formation of two types of histopathological inclusions: senile plaques with the main role of β-amyloid peptides formed during specific cleavage of amyloid precursor protein (APP), and neurofibrils formed by pathological forms of protein. Both of these components are currently considered as potential molecular targets, the impact of which will allow to slow down or stop the development of the neurodegenerative diseases.

Aim: The aim of the work was to identify amyloid proteinopathy in the cerebral cortex during experimental neurodegeneration.

Materials & Methods: The study was performed on 20 white male rats, 24 months of age. The physical and process stress effect was reproduced for seven days.

Discussions & Results: Neurons of experimental group had a predominantly large bright, almost transparent nucleus, occupying more than half of the cytoplasm. The nuclei were eccentrically located with segregated nucleoli of irregular elongated shape. The basophilic substance was practically not detected in the cytoplasm when stained with thionin. Neurons with clear signs of apoptosis were noted. Congo red staining for amyloid revealed intracellular inclusions. Extracellular fibrillar structures were also found. In the group of intact animals, chromatin in the nucleus was clearly pronounced and a sufficient amount of basophilic substance was observed in the perikaryon.

Conclusions: Neurodegenerative disturbance in neurons of the cerebral cortex are characterized by apoptosis and proteinopathy with a pronounced predominance of intracellular and extracellular amyloid.

Biography

Zagrebian V L completed his PhD from the Volgograd State Medical University. Later he become the Vice Dean of Medical Faculty and was elected as Head of the Department of Histology, Embryology and Cytology of Volgograd State Medical University. He was elected as President of the Federation of Youth Scientific Societies of Medical Universities of Russian Federation. He is also an Associate Professor, who has published more than 150 papers in reputed journals and has been serving as an Issuing Editor of a scientific journal of Volgograd State Medical University.

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