

ADAPTIVE MECHANISMS OF CEREBRAL CIRCULATION FOR ARTERIAL WILLIS PRIMITIVE FORM OF THE POLYGON

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Introduction: The cerebral arterial system is based on one of the most effective body anastomosis systems - Arterial Willis polygon, whose integrity depends on the possibility of developing the nerve material. Willis polygon shape has many polymorphisms, one of which is its primitive form. Hand in hand with the development of cerebral blood vessels and its evolution towards the primitive form of the arterial circle, the cerebral staff is irrigated disproportionately, to which the body is manifesting certain adaptational short-term and long-term mechanisms.

Purpose and Objectives: Highlighting of the mechanisms of cerebral circulation regulations in primitive form of Willis arterial circle on behalf of literature and macroscopic analysis of preparations studied.

Materials and methods: The project is based on 12 prepared anatomical researches, out of which the primitive form was documented in a single preparation. Interested arteries were identified by injecting red neoprene latex.

Results: Immediate arrangements are made by local production of adenosine and installation of three characteristic effects: vasodilatation, increase of local blood flow, increase of oxygen intake. Increased lactate concentration, protons and carbon dioxide-induced local vasodilatation. Due to inefficient irrigation is stimulated the endothelial synthesis in the posterior communicating artery walls. They act on the endothelial receptor type B of the cerebral cell membrane formation induces vasodilatation by nitric oxide and prostaglandin I₂. When the posterior communicating arteries are dilated sufficiently, capable of providing optimal blood needs of neurons, PGI₂ mediates inactivation of endothelial receptor type B by its glycosylation. Then there is a cleavage enzyme affinity for the receptor α I segment part B. Note that α I is the structure that differentiates the receiver B, the Type A, so it produces conversion receiver B to A. Under the action of endothelial 1 A receptor activates protein G_p with subsequent formation translator mates messengers that bind to receptors and channels of sarcolemma induce calcium released by them. But initiating contraction by calcium ions is checked by the ET B receptor interaction with ET₃ and therefore - enzyme inactivation myosin light-chain kinas. This enzyme is responsible for coupling actin to myosin that is not initiated acto-myosin coupling. Calcium in the cytoplasm outside the muscle cell is removed, so between the 2 limits between which collagen and elastin fibers interwoven through the corridor of calcium (calcium channels) activated by NANC system. Collagen as a fixing calcium protein, as a result it strengthens the fibrous skeleton of the vessel that determines an optimal diameter of irrigation of cerebral staff.

Conclusion: In the case of the primitive form of the Willis Polygon the body does not offer any complementary conditions (the absence of the vertebral truck) preventing the pathology. When speaking about the posterior communicating artery there are noticed morph-functional modifications that are absolutely necessary for the uniform distribution of the blood flow.

Keywords: Polygon Willis, primitive form, endothelin.

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