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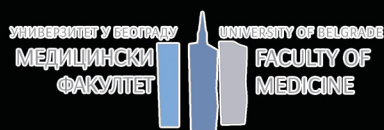


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Progesterone treatment preserves cortical pro-/antioxidant balance, DNA integrity and cell morphology in rat cerebral hypoperfusion model

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Cerebral hypoperfusion (CH) is recognised as a contributor to various impairments characteristic for elderly population and patients with vascular dementia and Alzheimer's disease. CH-induced brain damage is linked with oxidative stress in the cells that can cause DNA fragmentation and cell death, reflected through a change in cells' morphology.

Our study investigated the beneficial effects of progesterone (P4), a hormone with neuroprotective properties, against CH-induced oxidative stress and neurodegenerative pathologies in rat prefrontal cortex (PFC). For the purpose of the experiment, adult male Wistar rats were divided into groups: (I) animals subjected to permanent bilateral occlusion of common carotid arteries (2VO) treated with vehicle (commercial flax oil, 1 mg/kg/day), (II) animals subjected to 2VO treated with P4 dissolved in vehicle (1.7 mg/kg/day) and (III) animals subjected to sham operation treated with vehicle. Animals were sacrificed after 7 subcutaneous treatments. Levels of pro-/antioxidant balance (PAB) and DNA fragmentation along with cell morphology were estimated by well-defined methods.

The results revealed that P4 administration moderated CH-induced impairments in PFC, not only by decreasing PAB level and diminishing DNA fragmentation, but also preserving the cell morphology reflected through clearly defined cell bodies, with round nuclei, prominent nucleolus and visible Nissl bodies in layer III.

Obtained results point out that P4 is able to attenuate CH-induced pro-oxidant state and subsequent changes in PFC. This hormone holds promise as an effective agent for the CH treatment, still, its specific actions remain to be discovered.

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