C-Phycocyanin: a New Promising Therapeutic Candidate Against Ischemic Stroke


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Introduction: Ischemic stroke has a huge economic and social impact. Here, we aim to present results from different models supporting the potentiality of C-Phycocyanin (C-PC) from the cyanobacteria *Spirulina platensis* to counteract brain ischemia. Methods: In gerbils subjected to a transient bilateral common carotid arteries occlusion (BCCAo), C-PC was given daily during a week before or at different doses for 30min, 3, 6 and 12h after the surgery. In Wistar rats, permanent BCCAo or focal ischemia induced by the intracerebral injection of the endothelin-1 (ET-1) vasoconstrictor was followed by the same C-PC therapeutic schedule. Isolated rat brain mitochondria (RBM) was used to evaluate the C-PC effects against Ca\(^{2+}\)/Pi impairment. Results: C-PC given either prophylactically or therapeutically in gerbils reduced the infarct volume, the neurological deficit and the oxidative stress at 24 h post-stroke. After 7 days of reperfusion, C-PC protected the hippocampal neurons, improved the functional outcome and the gerbils survival [1]. C-PC modulated the gene expression, assessed by qRT-PCR at 24h post-ligation, involved in the neurovascular unit integrity and the anti-inflammatory response in hypoperfused rat brains. C-PC also promoted a dose dependent decrease in the infarct volume 24h after the ET-1 infusion in rats. In the RBM exposed to a Ca\(^{2+}\)/Pi overload, C-PC prevented the mitochondrial permeability transition, the membrane potential dissipation, the ROS levels increase and the cytochrome c release [2]. Conclusions: C-PC is a promising neuroprotective agent against ischemic stroke, resulting in reduced neurovascular injury, the improvement of functional outcomes and the protection of mitochondria from impairment.


Keywords: C-Phycocyanin; ischemic stroke; neuroprotection

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