



Chronic Treatment with Red Wine Polyphenol Compounds Mediates Neuroprotection in a Rat Model of Ischemic Cerebral Stroke

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Résumé en anglais

In this study, we investigated the *in vivo* effects of red wine polyphenol compounds (RWPC) in rats that were submitted to middle cerebral occlusion as an experimental model of stroke. Male Wistar rats were given RWPC [30 mg/(kg · d) dissolved in drinking water] or water for 1 wk before being subjected to transient middle cerebral artery occlusion followed by reperfusion. Sham-operated rats were subjected to transient occlusion in which the filament was not completely introduced. The release of amino acids and energy metabolites were monitored by intracerebral microdialysis. The volume of the ischemic lesion was assessed 24 h after reperfusion. Proteomic analysis of brain tissue was performed to study the effects of ischemia and RWPC on specific protein expression. Treatment with RWPC completely prevented the burst of excitatory amino acids that occurred in response to ischemia in untreated rats and significantly reduced brain infarct volumes. Rats chronically treated with RWPC, however, had lower basal concentrations of energy metabolites, including glucose and lactate in the brain parenchyma, compared with untreated rats. Chronic RWPC treatment significantly enhanced the residual cerebral blood flow during occlusion and reperfusion in rats subjected to transient occlusion compared with untreated rats. This effect resulted from arterial vasodilatation, as the internal diameters of several arteries were significantly enlarged after RWPC treatment. Proteomic studies revealed the modulation by RWPC of the expression of proteins involved in the maintenance of neuronal caliber and axon formation, in the protection against oxidative stress, and in energy metabolism. These findings provide an experimental basis for the beneficial effects of RWPC on the neurovascular unit during stroke.

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