ABSTRACT
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Effect of L-Carnitine and Atorvastatin on a Rat Model of Ischemia-Reperfusion Injury of Spinal Cord

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Abstract

Spinal cord is one of the most sensitive and functioning tissues susceptible to ischemic damage. Spinal cord injury (SCI) can cause catastrophic outcomes, such as paraparesis or paraplegia. After thoraco-abdominal surgery, aortic injury may result in interruption of spinal arterial circulation. Even if patient has normal neurological functions immediately after surgery, neurological deficits may develop in the following days, which may be explained by the development of clinically pathological SCI not only with ischemia, but also with reperfusion. Oxidative stress and inflammation are probably the key players in the development of motor dysfunction following spinal cord IRI. Massive production of ROS, including free radicals and lipid peroxides is also involved in the neurological vascular injuries. In addition, oxidative stress induced by ischemia leads to alteration of various genes and signalling pathways. L- carnitine is a water-soluble natural vitamin-like compound that is obtained primarily from the diet, and is a superoxide scavenger, antioxidant, and DNA cleavage protector. It is also claimed to have an anti-ischemic action and a stabilizing effect on cell membranes. The statins are the most widely used cholesterol-lowering medications. Previous clinical investigations have demonstrated that statins cause a significant decrease in the incidence of ischemic stroke in patients with and without high levels of serum cholesterol. Numerous putative benefits have been ascribed to statins including suppression of apoptosis, antioxidant and anti-inflammatory effects, immunomodulation, neuroprotection and promotion of tissue regeneration. Thus, it has been suggested that statins may exhibit neuroprotective properties that contribute to a reduction in the severity of the pathophysiological processes induced by the ischemic insult via a mechanism that is independent of their cholesterol-lowering effect.

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