

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

Esraa A. Salem

Medical Physiology and Pathology Departments, Faculty of medicine, Menoufia University, Shebein Elkom, Egypt

Abstract

Pro-inflammatory cytokines and reactive oxygen species (ROS) are produced in acute spinal cord injury, leading to myelin breakdown, inflammation, mitochondrial dysfunction and apoptosis of neurons and glial cells. The aim of the present study was to investigate possible protective effects of L-carnitine (carn) or atorvastatin (ator) on spinal cord ischemia-reperfusion injury (IRI). Rats were randomized into nine equal groups (n=8): control and control taking carn (100mg/kg BW), ator (2.5mg/ kg BW) or both, as well as sham-operation, IRI and IRI taking same doses of carn, ator or both. Neurological assessments were done 48 hours after IRI, and serum nitrite/nitrate was measured. Finally, lumbar segments of spinal cord were excised, and part was homogenized and prepared for measuring tumor necrosis factor- α (TNF- α), interleukin-1 β (IL-1 β), malondialdehyde (MDA), advanced oxidation protein products (AOPP), reduced glutathione (GSH), glutathione peroxidase (GPx), superoxide dismutase (SOD) and catalase. The other part was sectioned for evaluation of histopathological changes and for immunostaining by glial fibrillary acidic protein (GFAP), Bax and Bcl-2. The IRI increased ROS (nitrite/nitrate, MDA, AOPP) and pro-inflammatory cytokines (TNF- α , IL-1 β), and decreased antioxidants (GSH, GPx, SOD, catalase) with impaired sensory and motor functions. Astrogliosis was detected by GFAP, and increased apoptosis was demonstrated by increasing Bax and decreasing Bcl2. Treatment with carn or ator alone decreased TNF- α , IL1 β , nitrite/nitrate, MDA and AOPP, and increased GSH, GPx, SOD and catalase with improvement of neurological functions and histological studies. Combination of carn and ator improved most of measured IRI-affected parameters better than isolated carn or ator administration.

Biography :

Dr. Esraa A. Salem PHD candidate working as Assistant Lecturer of Clinical Physiology, Msc in medical physiology ,over 7 years teaching experience for postgraduate and undergraduate medical student's general & special physiology Courses, students' project supervision, tutorials, seminars, & marking also Teaching for complementary medicine program.

Note: This work is partly presented at International Conference on Sports Medicine, Physical Rehabilitation & Physiotherapy | November 12-13, 2020 | London, UK