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Oral Presentation

Protective Effect of Alpha-Lipoic Acid on Neuronal Degeneration Due to Sciatic Nerve Transection in Rat

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Abstract

Peripheral nerve injury induces inflammation and oxidative stress, which are the most significant causes of the neuronal death. Alpha Lipoic acid (α-LA) as a potent antioxidant and anti-inflammatory agent may counteract the oxidative stress and inflammatory response. This study was designed to investigate the protective effect of α-LA on neuronal cell death in L4 dorsal root ganglion (L4-DRG) induced by unilateral sciatic nerve transection (SNT) in rat. Thirty male Wistar rat were divided into 5 groups (n=6); control (intact), SNT+ Salin, SNT + α-LA (100 mg/kg; i.p), SNT+ vitamin C (150mg/kg: i.p) and sham. Treatment was started 1 hour after injury and continued up to 7th-day post-injury. At 21st day post-injury, the L4-DRG were dissected out, fixed (formalin 10%), processed for paraffin embedding. Serial sections of L4-DRGs were prepared, stained (H&E and Toluidine blue) and then examined microscopically. The mean volume of L4-DRGs was estimated using Cavalieri principle and neurons count was done using a stereological technique (Disector method). Data were analysed with SPSS statistics 16.0 software ANOVA and intergroup comparisons performed using a Tukey-Post how analysis. In comparison with control, the number of neurons in SNT + α-LA and sham groups had no significant differences. The number of neurons in the SNT+Salin and SNT+ vitamin C were significantly reduced ($P<0.05$). α-LA (100 mg/kg.bw) provides comparable protection of sensory neurons after axotomy unlike vitamin C in rats. It seems that α-LA is a profound neuroprotective and promising anti-inflammatory agent in healing peripheral nerve injury.

Keywords: Alpha Lipoic Acid, Peripheral Nerve Injury, Inflammation, Oxidative Stress

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