The effect of dietary sesame oil and ginger oil as antioxidants in the adult rat dorsal root ganglia after peripheral nerve crush injury

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Abstract

Aim: The purpose of this study was to investigate the effect of dietary sesame oil and ginger oil supplements on the dorsal root ganglia following a sciatic nerve crush model in male Wistar albino rats.

Materials and methods: Crush injury models have been done by means of graded forceps (50 Newton). The animals were given a daily sesame oil (4ml/kg/day) and ginger oil (400mg/kg/day) via oral gavage for a period of 28days. Dorsal root ganglia from the L5 levels were harvested.

Processing of tissues was done for electron microscopy and light microscopy. Immunohistochemical staining with active caspase-3 antibody and qualitative ultrastructural analyses of tissues were made by a light and a transmission electron microscope, respectively.

Results: The results showed that crush injury leads to remarkable ultrastructural changes in sensory neurons, such as swollen mitochondria, disruption of cristae structure, glial cell proliferation and, consequently, phagocytosis of the damaged neuron. These ultrastructural changes were less evident in the treated groups, and both natural compounds reduced the expression of activated caspase-3, which may also affect ultrastructural changes.

Conclusion: The application of the natural products sesame oil and ginger oil may represent a supportive approach to the protection of sensory neurons against the destructive effects of peripheral nerve crush injury.

Keywords

Crush injury; electron microscopy; ultrastructural changes; sciatic nerve injury; sensory neurons