Palm vitamin E reduces locomotor dysfunction and morphological changes induced by spinal cord injury and protects against oxidative damage

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Spinal cord injury (SCI) occurs following different types of crushes. External and internal outcomes of SCI are including paralysis, cavity, and cyst formation. Effects of dietary derived antioxidants, such as palm vitamin E on central nervous system (CNS) encourage researchers to focus on the potential therapeutic benefits of antioxidant supplements. In the present study, experiments were carried out to evaluate the neuro-protective effect of the palm vitamin E on locomotor function and morphological damages induced SCI. Seventy-two male rats (Sprague-Dawley) were randomly divided into four groups: sham (laminectomy); control (supplemented with the palm vitamin E at a dose of 100 mg/kg/day); untreated-SCI (partial crush, 30–33% for 20 sec); treated-SCI (partial crush, 30–33% for 20 sec supplemented with the palm vitamin E at a dose of 100 mg/kg/day). The treatment with the palm vitamin E significantly improved the hind limb locomotor function, reduced the histopathological changes and the morphological damage in the spinal cord. Also, the palm vitamin E indicated a statistically significant decrease in the oxidative damage indicators, malondialdehyde (MDA) level and glutathione peroxidase (GPx) activity in the treated-SCI compared to the untreated-SCI.

Some major clinical health problems cause potential to immobilize a person suspected of having a spinal cord injury (SCI)1. Although many novel therapies are联手 to enhance neuroregeneration in SCI after injury, but the rate of disability after SCI are still high2. The National Acute Spinal Cord Injury Study (NASCIS) reported in 1990 that the neurologic outcomes were improved by intra-venous (IV) of methylprednisolone (MPS) in those patients with SCI when were administered within 24 hours: in the first 8 hours of the SCI, the highest dose of MPS was necessary3. Till now, some major side effects of MPS, such as depression, dizziness, anxiety, toxicity on kidney and liver have been reported4,5. Such problems encourage researchers to develop investigations for discovering new therapeutic agents with minimum side effects and high efficiency. Through human clinical trials conducted at the University of Maryland Medical Center in 2004; a new drug namely mono-sialo-tetra-hexosyl-ganglioside 1 (GM1) antibody for improving of SCI has been proposed6,7. Those patients treated with GM1-ganglioside showed significant improvement in their neurologic recovery during the first year after the injury compared to those who were receiving placebo. These findings were based on the early animal model reports which suggested that GM1-ganglioside and MPS were effective drugs for improving the metabolic, vascular, functional, and pathological outcomes of traumatic SCI6,7. Antioxidant effects of palm vitamin E, increase the Basso, Beattie and Bresnahan (BBB) locomotor function scale of animals with SCI7. There are some reports which indicate that palm vitamin E deficiency may lead to pathologic changes in muscular and nervous systems8,9.

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