Alfa-lipoic acid controls tumor growth and modulates hepatic redox state in Ehrlich-ascites-carcinoma-bearing mice.

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Source
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Abstract
The effect of oral supplementation of α-lipoic (LA) on growth of Ehrlich ascites carcinoma cells (EACs) and hepatic antioxidant state in mice was investigated. The results revealed that α-lipoic (LA) acid at 50 mg/kg body wt reduced the viability and volume of EAC cells and increased the survival of the treated animals. In addition, LA normalized oxidative stress in liver of mice-bearing EAC cells evidenced by increasing the levels of total thiols, glutathione, glutathione-S-transferase, superoxide dismutase, and catalyse. On the other hand, significant decreases in the levels of malondialdehyde and protein carbonyl were demonstrated in liver indicating controlled oxidative stress in these animals. As a consequence, LA regulated liver enzymes, alkaline phosphatase, aspartate aminotransferase, alanine aminotransferase, and gamma-glutamyl transferase. The data also indicated the efficiency of LA as cancer inhibitor and therapeutic influence. In conclusion, the present data suggest LA as a potential therapeutic complement in the treatment or prevention of different pathologies that may be related to an imbalance of the cellular oxidoreductive status associated with malignancy.

Intraperitoneal Alpha-Lipoic Acid to prevent neural damage after crush injury to the rat sciatic nerve.

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Source
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Abstract
OBJECTIVE:

Crush injury to the sciatic nerve causes oxidative stress. Alfa Lipoic acid (a-LA) is a neuroprotective metabolic antioxidant. This study was designed to investigate the antioxidant effects of pretreatment with a-LA on the crush injury of rat sciatic nerve.

METHODS:

Forty rats were randomized into four groups. Group I and Group II received saline (2 ml, intraperitoneally) and a-LA (100 mg/kg, 2 ml, intraperitoneally) in the groups III and IV at the 24 and 1 hour prior to the crush injury. In groups II, III and IV, the left sciatic nerve was exposed and compressed for 60 seconds with a jeweler's forceps. In Group I (n = 10), the sciatic nerve was explored but not crushed. In all groups of rats, superoxide dismutase (SOD) and catalase (CAT) activities, as well as malondialdehyde (MDA) levels were measured in samples of sciatic nerve tissue.

RESULTS:

Compared to Group I, Group II had significantly decreased tissue SOD and CAT activities and elevated MDA levels indicating crush injury (p < 0.05). In the a-LA treatment groups (groups III and IV), tissue CAT and SOD activities were significantly increased and MDA levels significantly decreased at the first hour (p < 0.05) and on the 3rd day (p < 0.05). There was no significant difference between a-LA treatment groups (p > 0.05).

CONCLUSION:

A-LA administered before crush injury of the sciatic nerve showed significant protective effects against crush injury by decreasing the oxidative stress. A-LA should be considered in the treatment of peripheral nerve injuries, but further studies are needed to explain the mechanism of its neuroprotective effects.

Antioxidant therapy: current status and future prospects.

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Source

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Abstract

Reactive oxygen species (ROS) are widely believed to cause or aggravate several human pathologies such as neurodegenerative diseases, cancer, stroke and many other ailments. Antioxidants are assumed to counteract the harmful effects of ROS and therefore prevent or treat oxidative stress-related diseases. In this report, recent human studies exploring the efficiency of antioxidants in prevention and treatment of various diseases are reviewed. Few antioxidants including edaravone (for ischemic stroke in Japan), Nacetylcysteine (for acetaminophen toxicity), alfa-lipoic acid (for diabetic neuropathy) and some flavonoids (polyphenolic compounds present in dietary plants), such as micronized purified flavonoid fraction (diosmin and hesperidin) and oxerutins (for chronic venous insufficiency) as well as baicalein and catechins (for osteoarthritis) have found accepted clinical use. However, despite much enthusiasm in the 1980s and 1990s, many well-known
agents such as antioxidant vitamins and also more recently developed compounds such as nitrones have not successfully passed the scrutiny of clinical trials for prevention and treatment of various diseases. This has given rise to a pessimistic view of antioxidant therapy, however, the evidence from human epidemiological studies about the beneficial effects of dietary antioxidants and preclinical in vitro and animal data are compelling. We have probably wasted too much time on agents like antioxidant vitamins instead of focusing on more disease specific, target-directed, highly bioavailable antioxidants. We here discuss possible reasons for the lack of success in some clinical trials and seek to provide some suggestions to be considered if antioxidant therapy is to succeed as an effective therapeutic strategy.