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Effect of long term intake of aspartame on antioxidant defense status in liver.

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Abstract

The present study evaluates the effect of long term intake of aspartame, the artificial sweetener, on liver antioxidant system and hepatocellular injury in animal model. Eighteen adult male Wistar rats, weighing 150-175 g, were randomly divided into three groups as follows: first group was given aspartame dissolved in water in a dose of 500 mg/kg b.wt.; the second group was given a dose of 1000 mg/kg b.wt.; and controls were given water freely. Rats that had received aspartame (1000 mg/kg b.wt.) in the drinking water for 180 days showed a significant increase in activities of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) and γ-glutamyl transferase (GGT). The concentration of reduced glutathione (GSH) and the activity of glutathione peroxidase (GPx), and glutathione reductase (GR) were significantly reduced in the liver of rats that had received aspartame (1000 mg/kg b.wt.). Glutathione was significantly decreased in both the experimental groups. Histopathological examination revealed leukocyte infiltration in aspartame-treated rats (1000 mg/kg b.wt.). It can be concluded from these observations that long term consumption of aspartame leads to hepatocellular injury and alterations in liver antioxidant status mainly through glutathione dependent system.

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PMID: 21376768 [PubMed - indexed for MEDLINE]

+ MeSH Terms, Substances

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- Aflatoxin B₁ and ethanol co-exposure induces hepatic oxidative damage [Toxicol Ind Health. 2010]
- Progression of diethylnitrosamine-induced hepatic carcinogenesis in ca [World J Gastroenterol. 2009]
- Nickel induced lipid peroxidation in the rat: correlation with nickel effect on a [Toxicology. 1990]
- Enhancement of pro-oxidant effect of 7,12-dimethylbenz (a) anthrace [Cancer Lett. 2006]
- Efficacy of caffeic acid in preventing nickel induced oxidative damage in live [Chem Biol Interact. 2008]

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Chemical Compound Information



Aspartame
MW: 294.30 g/mol
MF: C₁₄H₁₈N₂O₅

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