Abstract

**BACKGROUND:**
Experimental liver fibrosis induced by carbon tetrachloride (CCl(4)) is associated with oxidative stress, lipid peroxidation, and inflammation. This work was focused on elucidating the anti-inflammatory and antioxidant effects of ethylenediaminetetraacetic acid (EDTA) in this model of hepatotoxicity.

**METHODS:**
Wistar male rats were treated with CCl(4) and EDTA (60, 120, or 240 mg/kg). Morphometric analyses were carried out in Masson’s stained liver sections to determine fibrosis index. Coagulation tests prothrombin time (PT) and partial thromboplastin time (PTT) were also determined. Gene expression for transforming growth factor beta (TGF-beta1), alpha1(I) procollagen gene (alpha1 Col I), tumor necrosis factor alpha (TNF-alpha), interleukin-6 (IL-6), and superoxide dismutase (SOD) was monitored by real-time PCR. Antioxidant effect of EDTA was measured by its effects on lipid peroxidation; biological activity of ceruloplasmin (Cp), SOD, and catalase (Cat) were analyzed by zymography assays.

**RESULTS:**
Animals with CCl(4)-hepatic injury that received EDTA showed a decrement in fibrosis (20%) and lipid peroxidation (22%). The mRNA expression for TNF-alpha (55%), TGF-beta1 (50%), IL-6 (52%), and alpha1 Col I (60%) was also decreased. This group of animals showed increased Cp (62%) and SOD (25%) biological activities. Coagulation blood tests, Cat activity, and gene expression for SOD were not modified by EDTA treatment.

**CONCLUSION:**
This study demonstrates that EDTA treatment induces the activity of antioxidant enzymes, decreases lipid peroxidation, hepatic inflammation, and fibrosis in experimental liver fibrosis induced by CCl(4).