Antioxidant biofactor, a processed grain food, inhibits iron nitrilotriacetate-induced renal tumorigenesis, hyperproliferative response, and oxidative damage

Abstract

We have evaluated the effect of dietary antioxidant, antioxidant biofactor (a processed grain food), on iron nitrilotriacetate-induced renal tumorigenesis, hyperproliferative response, and oxidative damage. In tumorigenesis studies, iron nitrilotriacetate alone treatment resulted in a development of 75% renal cell tumor incidence, whereas, in the group of animals fed with antioxidant biofactor diet and treated with iron nitrilotriacetate, only 43% of renal cell tumor incidence was observed. In oxidative damage studies, the decrease in the level of renal glutathione and antioxidant enzymes induced by iron nitrilotriacetate was significantly reversed by antioxidant biofactor diet pretreatment in a dose-dependent manner (18-71% recovery, P < 0.05). Antioxidant biofactor diet pretreatment also resulted in a dose-dependent inhibition (35-49% inhibition, P < 0.05) of iron nitrilotriacetate-induced lipid peroxidation as measured by thiobarbituric acid reactive substances formation in renal tissues. Similarly, in hyperproliferation studies, antioxidant biofactor diet pretreatment showed a strong inhibition of iron nitrilotriacetate-induced renal ornithine decarboxylase activity (18-54% inhibition, P < 0.05). In addition, antioxidant biofactor fed diet pretreatment also protected the kidney tissues against observed histopathological alterations. From this data, it can be concluded that antioxidant biofactor diet can abrogate the toxic and tumor promoting effects of iron nitrilotriacetate and can serve as a potent chemopreventive agent to suppress oxidant-induced tissue injury and tumorigenesis. © 2008 SAGE Publications.