Protective effect of curcumin on N-nitrosodiethylamine and carbon tetrachloride-induced hepatocarcinogenesis in Sprague-Dawley rats

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Abstract:

Curcumin, the yellow spice derived from the roots (rhizomes) of the plant Curcuma longa, has been reported to have a chemoprotective effect against several neoplasms. The protective effect of curcumin during N-nitrosodiethylamine- and carbon tetrachloride-induced hepatocarcinogenesis in Sprague-Dawley rats and its effect on the expression of IkappaB-alpha mRNA were evaluated. Sixty male rats were randomly assigned into four experimental groups. Group A animals received a single i.p. injection of N-nitrosodiethylamine (200 mg/kg b.w.). After 1 week, the animals received weekly s.c. injections of carbon tetrachloride (3 ml/kg b.w./week) for 6 weeks. Group B was given diet containing 0.2 % curcumin 2 weeks before the injection of N-nitrosodiethylamine and continued throughout the experimental period (20 weeks). Group C was given only a diet containing 0.2 % curcumin for the whole period of the experiment. Group D animals served as control. The level of IkappaB-alpha (IкB-α) mRNA was determined by semiquantitative PCR. Administration of diet containing 0.2 % curcumin, 2 weeks before the injection of N-nitrosodiethylamine and throughout the period of experiment, decreased percentage of preneoplastic foci in hepatic parenchyma and inhibited the development of hepatocellular carcinoma, cholangiofibrosis, and cystic cholangioma in rat liver. Moreover, curcumin administration decreased the number and size of the preneoplastic foci induced by N-nitrosodiethylamine and carbon tetrachloride in the liver. The densitometric analysis of the IкB-α mRNA bands revealed that curcumin administration blocked the decrease of IкB-α mRNA induced by N-nitrosodiethylamine and carbon tetrachloride. These results concluded that curcumin inhibited hepatocarcinogenesis induced by N-nitrosodiethylamine and carbon tetrachloride through blocking IкB-α degradation.

Keywords:

N-nitrosodiethylamine Carbon tetrachloride Hepatocarcinogenesis Curcumin IkappaB-alpha

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