

Garlic Oil Attenuated Nitrosodiethylamine-Induced Hepatocarcinogenesis by Modulating the Metabolic Activation and Detoxification Enzymes

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Abstract :

Nitrosodiethylamine (NDEA) is a potent carcinogen widely existing in the environment. Our previous study has demonstrated that garlic oil (GO) could prevent NDEA-induced hepatocarcinogenesis in rats, but the underlying mechanisms are not fully understood. It has been well documented that the metabolic activation may play important roles in NDEA-induced hepatocarcinogenesis. Therefore, we designed the current study to explore the potential mechanisms by investigating the changes of hepatic phase I enzymes (including cytochrome P450 enzyme (CYP) 2E1, CYP1A2 and CYP1A1) and phase II enzymes (including glutathione S transferases (GSTs) and UDP- Glucuronosyltransferases (UGTs)) by using enzymatic methods, real-time PCR, and western blotting analysis. We found that NDEA treatment resulted in significant decreases of the activities of CYP2E1, CYP1A2, GST alpha, GST mu, UGTs and increases of the activities of CYP1A1 and GST pi. Furthermore, the mRNA and protein levels of CYP2E1, CYP1A2, GST alpha, GST mu and UGT1A6 in the liver of NDEA-treated rats were significantly decreased compared with those of the control group rats, while the mRNA and protein levels of CYP1A1 and GST pi were dramatically increased. Interestingly, all these adverse effects induced by NDEA were simultaneously and significantly suppressed by GO co-treatment. These data suggest that the protective effects of GO against NDEA-induced hepatocarcinogenesis might be, at least partially, attributed to the modulation of phase I and phase II enzymes.

Key Word :

Garlic oil, Nitrosodiethylamine, Cytochrome P450 enzyme, Glutathione S transferase, UDP-glucuronosyltransferase.

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