EFFECT OF ETHANOL PRETREATMENT ON HEPATOTOXICITY AND FAT ACCUMULATION INDUCED BY AFLATOXIN B_1 IN THE RAT

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ABSTRACT

Effect of ethanol pretreatment on aflatoxin B_1-induced necrosis, fat accumulation and glycogen depletion in liver of rats was investigated. Adult rats were pretreated with four oral doses of ethanol (4.0 g/kg) at 48, 45, 24 and 21 hours prior to a single i.p. administration of aflatoxin B_1 (2.0 mg/kg). Ethanol pretreatment enhanced severity of aflatoxin B_1-induced hepatic necrosis as shown by an increase in the activities of plasma glutamic pyruvic transaminase (PGPT) ($P < 0.001$) and plasma glutamic oxaloacetic transaminase (PGOT) ($P < 0.001$) at 72 hours after aflatoxin B_1 administration. It also had an enhanced effect on the accumulation of liver triglycerides ($P < 0.001$) and had an additive effect on liver cholesterol ($P < 0.05$) and cholesterol esters ($P < 0.01$). In time-course study, it was shown that hepatic necrosis, triglycerides, cholesterol and cholesterol esters occurred simultaneously in both groups of rat treated with aflatoxin B_1 alone and ethanol and aflatoxin B_1. These toxicological parameters were gradually increased to 36 hours and sharply increased to maximum response at 48 and 72 hours after aflatoxin B_1 administration. It seems that fat accumulation in liver induced by aflatoxin B_1 and ethanol and aflatoxin B_1 is probably not the possible causative factor of hepatic necrosis. Another important factor, hepatic glycogen as energy source was

also depleted by ethanol pretreatment ($P < 0.05$) at 48 hours after aflatoxin B_1 administration. The reduction in energy source of liver cell is suspected to interfere with cell volume regulation which would lead to cell swollen. It is likely that ethanol pretreatment might enhance aflatoxin B_1-induced hepatic necrosis by lowering cell capability to perform volume regulation.