

Histopathological and Biochemical Alterations in Dimethylnitrosamine Induced Liver Injury in Rats

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The histopathological and biochemical alterations during dimethylnitrosamine (DMN) induced hepatic fibrosis was studied in albino male rats. The morphological and behavioral changes of the animals, mortality rate, ascites and changes in liver weight and body weight were monitored during the progression of hepatic fibrosis. The liver injury was induced by intraperitoneal injections of dimethylnitrosamine (DMN) in doses of 1 mg /100 g body weight on 3 consecutive days of each week for 3 weeks. A set of control and treated animals were sacrificed on the 7th, 14th and 21st days after the start of DMN administration. The liver sections were subjected to histopathological examination. Total protein, histamine, and histaminase levels were measured in both serum and liver samples. Serum and liver hydroxyproline levels as well as the urinary excretion of hydroxyproline were monitored to study the collagen metabolism after the induction of hepatic fibrosis. A significant decrease was noticed in both liver weight and body weight of treated animals. Histopathological examination demonstrated intense neutrophilic infiltration, bile duct hyperplasia, Mallory's hyaline within cytoplasm, apoptosis of hepatocytes, dysplasia, bridging necrosis and extreme centrilobular necrosis and fibrosis. A decrease in total protein, histamine content and modulating histaminase levels were observed in both serum and liver. Studies on collagen metabolism depicted abnormal deposition of collagen in the liver accompanied with modulating serum hydroxyproline levels and increased urinary excretion of hydroxyproline. There was no correlation between collagen deposition in the liver and increased urinary excretion of hydroxyproline. The results of the present investigation demonstrated the pathophysiological alterations in liver and also impaired collagen metabolism during experimentally induced hepatic fibrosis in rats.

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