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Effect of Melatonin on Hepatic Fibrogenesis, Vitamin C and Hydroxyproline Levels in Liver of Ethanol-Fed Rats

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Abstract: Pineal-gland-derived melatonin (N- Acetyl 5-Methoxytryptamine), which is a known antioxidant hormone, is known to have inhibitory effects on cell growth and proliferation. Ethanol causes increases in lipid peroxidation, superoxide formation and collagen synthesis resulting in fibrosis in the liver due to alcohol intake. The aim of this study was to examine the effect of exogenously administered melatonin on liver tissue damage resulting from alcohol intake. A total of 30 male wistar albino rats were divided into three groups; Group 1 (control), Group 2 (ethanol-administration), and Group 3 (ethanol +melatonin administration). All the rats were fed with a specially modified diet for one week. At the end of the 1 st week, the control group rats were given isocaloric sucrose, while Group 2 and Group 3 rats were given gradually increasing amounts of ethanol to induce liver damage. The third group also received melatonin (10 mg/kg/day) together with ethanol. Biochemical and histopathological findings revealed the formation of liver damage after the ethanol application was completed. There was a significant increase ($p<0.001$) in the hydroxyproline levels in the livers of the Group 2 rats (8.57 ± 1.30 mg/gr tissue) when compared to those in the control group (4.90 ± 0.98 mg/gr tissue) whereas hydroxyproline levels in the livers of rats which had received melatonin together with ethanol was similar to those in the control group, indicating melatonin's protective effect. In addition, ascorbic acid (an important vitamin required for collagen synthesis) levels were reduced drastically ($p<0.001$) in Groups 2 and 3, when compared to those in the control group. The livers of rats given melatonin and ethanol had significantly higher ($p<0.001$) ascorbic acid levels than those of the Group 2 rats. In conclusion, exogenously given melatonin has a partial protective effect on development of fibrosis in alcohol-damaged liver.

Key Words: Hydroxyproline, ascorbic acid, alcoholic fibrosis, melatonin.

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