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Effects of Orchid Root Extract on Hepatic Toxicity Caused by Isoniazid in Rats

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Statement of the Problem: In addition to metabolism of different compounds, detoxification of drugs, environmental pollutants and, in general, of various toxins is one of the important functions of the liver (1). In most cases, during the detoxification process, metabolic activation by cytochrome P450 enzymes in liver microsomes causes production of toxic and active metabolites that can damage various tissues including the liver (2). Isoniazid also, despite its effectiveness in treating tuberculosis, causes acute complications for hepatic cells through the production of free radicals (3, 4). Hepatic toxicity caused by isoniazid can appear as cellular necrosis, steatosis (accumulation of fats), or both. Metabolites of this drug also have toxic effects on liver cells (5) Hydrazine is one of the most important metabolites of isoniazid. Plants have always been considered one of the main options for treating poisoned livers because they are available natural sources of antioxidants. orchid or Dactylorhiza lancibracteata (C. Koch) Renz, formerly named Orchis maculate L., belongs to the family Orchidaceae, has various species, and grows almost everywhere in the world. Its root nodules, which can usually be harvested in early summer, keep their medicinal properties for up to two years (6, 7). Therefore, considering the presence of antioxidant compounds in orchid, and given its protective effect against hepatic toxicity, this research was conducted to study the effects of aqueous extract of this plant against liver poisoning caused by isoniazid in rats.

Methodology & Theoretical Orientation: Rats were randomly place in the 7 eight-member groups of the control, the sham (receiving distilled water), the isoniazid group (that was given this medicine at 50 mg/kg), and the experimental groups 1, 2, 3, and 4 that received isoniazid at 50 mg/kg together with 40, 80, 160, and 320 mg/kg of the extract. The rats were injected intraperitoneally for 28 days, SPSS was employed to analyze the data, and one-way ANOVA and Duncan's test were used to compare the groups.

Findings: The groups treated with isoniazid and various doses of the extract significant reductions in serum levels of hepatic enzymes. Comparison of the various doses of the extract indicated the 320 mg/kg dose had the maximum therapeutic effect against hepatic injury caused by isoniazid.

Conclusion & Significance: Orchid extract, probably because of its antioxidant properties, could improve the destructive effects of isoniazid on the liver.

Biography

Hossein Kargar Jahromi has a PhD in Comparative Histology. He is a member of Research Center for Noncommunicable Diseases, Jahrom University of Medical Sciences, Jahrom, Iran and Zoonoses Research Center, Jahrom University of Medical Sciences, Jahrom, Iran.

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