

FREE PAPER 6:

EFFICACY AND SAFETY EVALUATION OF A NEW HEPATOPROTECTIVE POLYHERBAL FORMULATION IN ICR MALE MICE

K.A.A.U. Karunarathna¹, A.M. Abeysekera¹, U.G. Chandrika², B. Senevirathna³, C. Padumadasa¹ and T.M.S.G.Tennakoon⁴

- ¹ Department of Chemistry, University of Sri Jayewardenepura, Sri Lanka
- ² Department of Biochemistry, University of Sri Jayewardenepura, Sri Lanka
- ³ Department of Pathology, University of Sri Jayewardenepura, Sri Lanka
- ⁴ Link Natural Products (Pvt) Ltd, 199, Kew Road, Colombo 2

Background

A number of ayurvedic formulations are currently being used as hepatoprotective drugs, in the absence of such drugs in the modern system of medicine (Devraj et al, 2011). Most ayurvedic formulations are polyherbal. It is believed that the different actions of the constituents of plants enhance each other's effects and reduce side effects.

Objective

Evaluate the efficacy and safety of a new hepatoprotective polyherbal formulation (HPF) consisting of 14 herbs, formulated by an expert panel of ayurvedic physicians at Link Natural Products (Pvt) Ltd.

Method

Hepatoprotective activity of the HPF was studied against carbon tetrachloride (CCl₄) induced hepatotoxicity. The Institute of Cancer Research (ICR) male mice were divided into six groups (n=6). Individual groups received either the plant extract (at two-dose levels, 160 mg /kg b.w. and 240 mg /kg b.w. for two groups per each dose level) suspended in 0.25% carboxymethyl cellulose (CMC) or CMC alone (two groups) once daily for 7 consecutive days. Hepatotoxicity was induced by a single intra-peritoneal administration (IP) of CCl₄ in olive oil (0.08 ml/kg b.w.) in one of the groups receiving the plant extract (both dose levels) and CMC alone (pathological control). The safety of HPF in terms of liver toxicity was evaluated by acute oral toxicity and 14-day repeated dose toxicity study at doses of 160, 240, 320 and 400 mg/ kg b.w.

Results

The single IP administration of CCl₄ showed significant elevation in the serum biochemical parameters; alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (AP), total bilirubin (TB) levels and confluent necrosis in the liver (49% cellular damage), of the pathological control group with respect to the control group (p<0.05). Pre-treatment with the polyherbal formulation reduced hepatocellular necrosis (160 mg/kg b.w. and 240 mg/kg b.w. show 12±3% and 37±3.7% cellular damage respectively) as well as serum AST, ALT, AP and TB levels. A higher degree of protection was observed with the dose of 160 mg/kg b.w. of the herbal preparation.

Conclusion

Pre-treatment with the polyherbal formulation reduced hepatocellular necrosis and elevated serum AST, ALT, AP and TB levels. The highest protection was observed with the dose of 160 mg/kg b.w. of the herbal preparation. The HPF was found to be safe on acute oral exposure up to the dose at 400 mg/kg b.w. in ICR male mice. It did not show any signs of toxicity when given orally continuously for 14 days up to a dose of 400 mg/kg b.w.

Keywords: Polyherbal formulation, hepatoprotective activity, safety evaluation, acute oral toxicity study, 14-day repeated dose toxicity study

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References

Devraj, V.C., Krishna, B.G. Viswanatha, G. L. Kamath, J.V. Kumar S., (2011) Asian Pasific journal of Tropical Biomedicine, 142-146.

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