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Hepatoprotective Activity of a Compound Herbal Formulation "Detoxina" In Carbon Tetrachloride Induced Liver Damage

Introduction

Protection against liver damage has been reported for various individual ingredients in compound herbal formulation "Detoxina" (1-7). This study was therefore undertaken to assess the hepatoprotective effects of the Detoxina against carbon tetra chloride (CCl_4) induced liver damage.

Material and methods

Test drug material

The composition of Detoxina is as follows: Each 1080 grams contains powders of: Kutki (Picrorhiza kurroa) 240 gms, Punarnava (Boerhaavia diffusa) 240 gms, Kalmegh (Andrographis paniculata) 240 gms, Devdangri (Luffa echinata) 120 gms, Bhangro (Eclipta alba) 120 gms, and Bhuiavala (Phyllanthus niruri) 120 gms. The test drug (Detoxina) was provided by the manufacturers, M/s Pharmaveda in 60 mesh powdered blend. Detoxina was administered orally at a dose of 500 mg/kg in 1% carboxy-methyl cellulose suspension in distilled water.

Experimental animals

The study was carried out on Wistar albino rats (100-150 g) of either sex bred Haffkine Institute, Bombay, were used. The animals were fed standard pellet diet and water ad libitum. Before their use in the experiment the rats were kept in standard environmental conditions, (temperature 25-28°C and 12 h light/dark cycle).

Hepatoprotective activity testing

Animals were divided into 3 groups of 8 rats in each for all the experiment. The first group served as vehicle control and received normal saline only. The second group served as CCl_4 intoxicated control and received by gavage vehicle (normal saline) and CCl_4 diluted with liquid paraffin (1:1) subcutaneously. Third group was given test drug (Detoxina) orally at the dose of 500 mg/kg body

weight and CCl4 subcutaneously. The vehicle (1% carboxy-methyl cellulose in distilled water) or test drugs were administered orally for 6 days. CCl4 diluted with liquid paraffin (1:1) was administered in a dose of 1 ml/kg subcutaneously (s.c). Twenty four hours after CCl4 administration, blood was obtained from all groups of rats by puncturing retro-orbital plexus. The blood samples were allowed to clot for 45 min at room temperature. Serum was separated by centrifugation at 2500 rpm at 30°C for 15 min and analyzed for various biochemical parameters.

Assessment of liver function

Biochemical parameters: Serum glutamyl oxaloacetate transaminase (SGOT), Serum glutamyl pyruvate transaminase (SGPT), (8), Alkaline phosphatase (ALKP) (9), Total protein (TP) and Total albumin (TA) (10) were analyzed according to the reported methods.

Statistical analysis

Results of the biochemical estimations are reported as mean ±S.E. Student's t-test was used for determining significance (11).

Results and Conclusion

As shown in Table 1, activities of SGOT, SGPT alkaline phosphatase and albumin were markedly elevated while total protein level was decreased in CCl4 treated animals comparable to normal control rats. Administration of Detoxina at dose of 500 mg/kg markedly prevented CCl4 induced elevation of SGOT, SGPT, ALKP and TA and diminution of TP. It has been, therefore, found that Detoxina has antihepatotoxic activity. The above observations have shown that Detoxina contain active principles which may be responsible for producing their characteristic hepatoprotective action.

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Table 1

Effect of Detoxina on Serum enzymes, alkaline phosphatase total proteins and albumin in CCl4 induced liver damage in rats

Treatment	SGOT	SGPT	ALKP	TP	TA
Control	28.5 ± 1.58	35.7 ± 1.32	29.08 ± 2.05	6.51 ± 0.23	3.61 ± 0.34
CCl4	74.8 ± 1.98	89.0 ± 0.97	52.80 ± 1.32	4.87 ± 0.74	4.34 ± 0.48
Detoxina	32.2 ± 1.94*	38.9 ± 1.66*	29.65 ± 1.46*	7.53 ± 0.61*	3.69 ± 0.29*

$p<0.01$ v/s CCl4

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