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Hepatoprotective Activity of Kadhaka Kadhiradi Kashayam

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ABSTRACT: *Kadhaka Kadhiradi Kasayam (KKK) was screened for hepatoprotective activity against carbon tetrachloride induced liver injury in albino rats at a dose of 0.5ml/kg body weight. The drug reduced weight alkaline phosphatase and GOT activity in liver, cholesterol and GPT activity in serum. There was no effect on protein and liver glycogen.*

INTRODUCTION

Many of the metabolic activities of the body are centered in the liver. The liver undergoes rapid changes in size and in glycogen and pertain content depending upon nutritional state. But a damaged liver invariably shows increased alkaline phosphatase and glutamate pyruvic transaminase (GPT) and glutamate Oxalacetic transaminase (GOT). A similar response may follow exposure to various chemicals and drugs. Generally damage in liver takes place due to environmental factors, chemicals, drugs and contaminated food.

There are a number of herbs and formulations in t Indian system of Medicine to repair liver damage. In south India Ayurvedic drugs are prescribed to treat a wide variety of liver disease the drug kadhaka kadiradi kashayam is screened against carbon tetrachloride induced liver injury in albino rats (1).

MATERIALS AND METHODS

Kadhaka Kadhiradi Kasayam (KKK) is prepared in Astanga Ayurvedha sala Trichy. The drug was administered orally at a does of 0.5ml/kg body weight.

Male albino rats weighing 180-200g from the tetrex biological house used for the stud. They were three groups each consisting of seven rats. The first group served as control and received appropriate quantity of olive oil subcutaneously. The second group received carbon tetrachloride mixed in olive oil (1:1) at a dose of2 ml/kg body weight on the second and third day. The third group received kadhaka kadiradi kashayam at a dose of 0.5ml/kg body weight on all the four days. Carbon tetrachloride as administered on second & third day. The animals were maintained on Hindustan leer rat feed, Bengal gram, cabbage and water adlibitum. All the animals were sacrificed on the fifty day and blood was drawn through glass syringe by puncturing the heart and serum was separated. The wet weight of liver was recorded and 10% liver homogenate was prepared in cold double distilled water serum and liver homogenate were used for the determination of GPT (1), GOT (2), protein (3), Alkaline phosphatase (4), Glycogen (5) and cholesterol (6) were determined in liver and serum respectively.

Students 't' test was applied to analyse the results .

RESULTS & DISCUSSION

A tested medicine (KKK) protected the liver from carbon tetrachloride induced injury. A significant reduction in the alkaline phosphatase activity was caused b t tested drug in both liver and serum (Table 1&2) KKK reduced the liver weight and GOT activity in liver serum showed significant reduction in the alkaline phosphatase and GPT activities (Table 2). Serum cholesterol was also significantly reduced, The tested drug did not affect liver, serum proteins and liver glycogen significantly.

The mechanism of CCI4 liver injury is through the production of toxic trichloro methyl free radicals (CCl3) by the liver microsomes during the metabolism of carbontetra chloride (CCl4). The free radical is highly reactive and binds co-valently to proteins and lipids with the initiation of peroxidation of membrane lipids of endo plasimic reticulum leading to cell necrosis (7-10) Since the tested compound have reduced the activity alkaline phosphatase; GPT&GOT, it can be assumed that the leakage of enzymes is effectively controlled and the in-tegrity of cellular membrane is maintained.

Phyllanthus emblica and Gircumalonga present in KKK is reported to possess anti hepato-toxic properties. Gulati et al (II) have observed that the biflavanoid present in emblica prevents cyto toxicity in isolated hepatocytes caused by CCl4 and tertiary butylhydroperoxide. Kiso et al (12) found that anti hepatotoxic effect of curcumca longa against CCI4 induced liver damage was due to curcuminoids and some analogues of ferulic acid and P. Coumeric acid probable metabolites of curcuminocds also have liver protective activity.

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Effect of kathaka kadhiradi kashayam on serum biochemical parameters (Values are mean ±SD)

Group	Protein mg/100mg	Alkaline Phosphatase	GPT	GOT	Cholesterol mg/100ml
Normal olive oil 2 ml/kg	10266 ± 1331	35.03±6.32	56.96±3.24	8.2±0.645	16.62±0.197
Carbon tetra chloride 2ml/kg	1035±1515	49.62±2.56	72.51 ± 3.801	22.25 ± 2.98	22.0 ± 3.69
kathaka kadhiradi kashayam 0.5mg/kg	8840±1023	23.66±3.26b	47.62 ± 2.56	24.0 ± 3.9	16.3 ± 0.30a

1. Expressed as mg phenol liberated/100ml Serum in 15 min at 37oC
2. Expressed as mg phenol liberated/100ml Serum in 30 min at 37oC
3. Expressed as mg phenol liberated/100ml Serum in 60 min at 37oC

Value are significant when $P<0.05$
P value a=$p<0.05$, b=$p<0.001$

Effect of kathaka kadhiradi kashayam on Liver biochemical parameters

Group	Liver weight g/100g body weight	Glycogen g/100g	Protein mg/g	Alkaline Phosphatase	GPT	GOT
Normal olive oil 2 ml/kg	3.134 ±0.114	1.85 ± 0.172	100.0 ± 10.5	0.0030 ± 0.0004	0.587 ± 0.097	0.1968 ± 0.041
Carbon tetra chloride 2ml/kg	3.670 ±0.025	1.56 ± 0.147	119.0 ± 20.2	0.0108 ± 0.00093	0.5903 ± 0.128	0.4966 ± 0.069

kathaka kadhiradi kashayam 0.5mg/kg	3.400 ± 0.096	1.63 ± 0.134	101.0 ± 8.27	6.0042b ± 0.00014	0.5615 ± 0.114	0.4245b ± 0.004

1 Expressed as mg phenol liberated/mg protein in 15 min at 37oC
2 Expressed as mg pyruvate/ mg protein in 30 min at 37oC
3 Expressed as mg pyruvate / mg protein in 60 min at 37oC

Value are significant when $P<0.05$
P value $a=p<0.05$, $b=p<0.001$