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Evaluation of hepatoprotective activities of combination of *Tinospora cordifolia* and *Curcuma longa* in paracetamol induced hepatoxicity in albino rats

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Objectives: The objective of this study was to evaluate the hepato-protective activities of combination of aqueous extract of (roots of *Tinospora cordifolia*, Tc +rhizomes of *Curcuma longa*, Cl) against paracetamol induced hepatic damage in rats.

Methods: The plant products (test drugs) were procured locally, shade dried, powdered and extracted with water. silymarin was used as standard hepatoprotective drugs and 2% gum acacia as a control (vehicle) against paracetamol (PCT) induced hepatotoxicity.

Experimental Procedure: The rats were divided into 5 groups of 6 rats in each group. Group A: 2% Gum Acacia solution; Group B: Paracetamol 3 g/kg. Group C: PCT+Silymarin 50 mg/kg; Group D: PCT+(Tc 200 mg/kg+Cl 100 mg/kg); Group E: (PCT+Tc 400 mg/kg+Cl 200 mg/kg). All the drugs were administered by oral gavage daily to the respective group rats for 7 consecutive days, on 8th day, paracetamol 3 g/kg was given to all except group A. On 9th day, blood samples were collected by retro-orbital method to estimate ALT, AST, ALP, GGT, TP, albumin, direct and total bilirubin (LFT). Following blood collection, rats were euthanized, and liver was harvested after hepatic perfusion was done for histopathological studies and to estimate antioxidants like SOD, MDA, Catalase, GPX and GSH.

Results & Discussion: Statistical analysis was done using one-way ANOVA, followed by Tukey test. Significant reduction ($p<0.01$) in serum levels of ALT, AST, ALP, GGT, DB, TB, MDA and significant improvement ($p<0.01$) in Albumin and TP were observed in Tc+Cl group compared to PCT treated group. Tissue antioxidants like SOD, Catalase, GPX and GSH also showed significant improvement ($p<0.01$) in the Tc+Cl group Vs PCT group. All Liver histopathology showed massive necrosis and degeneration, dilatation of sinusoids in PCT treated group vs control group. In the Tc+Cl group mild Grade 1 degenerative changes were seen, which was comparable to the Silymarin group. Preliminary phytochemical tests were done. Aqueous Tc and Cl extract showed presence of phenolic compound and flavonoids. Our findings suggested that (Tc+Cl) extract possessed hepatoprotective activity in a dose dependent manner.

Conclusions: The aqueous extract of (Tc+Cl) possess significant hepatoprotective and antioxidant activities, which prevents the hepatocellular damage caused by PCT.

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