HEPATOPROTECTIVE EFFECTS OF AQUEOUS EXTRACT OF ANDROGRAPHIS PANICULATA AGAINST CCL₄ INDUCED HEPATOTOXICITY IN ALBINO WISTAR RATS

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ABSTRACT

The effect of Andrographis Paniculata extract was studied on CCL₄ induced hepatic damage in rats. The degree of protection was measured by physical, biochemical changes, pretreatment with extract significantly prevented the physical, biochemical changes induced by CCL₄ in the liver. The effects of andrographis paniculata could be useful in preventing chemically induced acute liver injury. It can be concluded that the aqueous extract of A. Paniculata is almost significant effective in the standard drug.

Keywords: Carbon tetra chloride, A. Paniculata, Hepatoprotective, Liver enzymes.

INTRODUCTION

Liver disease is a health related problem and are on high today. A. paniculata is being investigated for its potential antiproliferative and apoptotic effects. The A. paniculata have been extensively studied for their hepatoprotective activity. The present pharmacological investigations focus on elevation of the efficacy of aqueous extracts of A. paniculata for its protection against carbon tetrachloride induced hepatotoxicity in rats.

MATERIAL AND METHODS

Extract of A. Paniculata and standard drug of silymarin were procured from Natural Remedies R&D Centre, Bangalore.

Phytochemical Analysis

Aqueous extract of A. Paniculata was subjected to identity the contains of primary chemical constituents, diterpenoid lactones and flavonoids. By the usual methods prescribed in standard texts.

Experimental animals

Albino wistar rats (100 to 120 gm) in the present studies. The animals were fed with standard pellet diet and water ad libitum. All the animals were received the drug by oral. The laboratory condition duly undertaken by registered veterinary practitioners.

Chemicals

All the chemicals were procured from sd.fine chemicals Ltd, Mumbai, India. Standard kits for SGOT, SGPT, ALP, LDH, Total Bil., Direct Bil., were obtained from Span diagnostics Ltd, India.

Toxicity studies

Healthy albino wistar rats of either sex weighing 100 to 120 gm maintained under standard laboratory conditions were used for acute oral toxicity test according to organisation for economic cooperation and development guidelines. A total of three animals were used which received a single oral dose of (200mg/kg) aqueous extract (8.9) after administration of extract the food was withheld for further 3-4h. Animals were observed individually at least once during first 30 mmts after dosing, periodically during first 24 h, with special attention drug the first 3-4h and daily thereafter for period for 3 days.

Methodology

The rats were divided into five groups of six animals (n=6) in each.

Group I

Received water (10ml/kg, P.O) for 9 days once daily and served as normal control.

Group II

Received carbon tetra chloride (CCL₄) 1ml/kg on 50%v/v olive oil, S.C on 7th day.

Group III

Received standard drug of silymarin (25mg/kg, P.O) for 9 days once daily and carbon tetra chloride (CCL₄) 1ml/kg in 50%v/v olive oil, S.C on 7th day.

Group IV

Received aqueous extract of A. Paniculata 50mg/kg 9 days once daily and carbon tetrachloride (CCL₄) 1ml/kg in 50%v/v olive oil, S.C on 7th day.

Group V

Received aqueous extract of A. Paniculata 100mg/kg 9 days once daily and carbon tetrachloride (CCL₄) 1ml/kg in 50%v/v olive oil, S.C on 7th day.

Group VI

Received aqueous extract of A. Paniculata 200mg/kg 9 days once daily and carbon tetrachloride (CCL₄) 1ml/kg in 50%v/v olive oil, S.C on 7th day.

Assessment of hepatotoxicity:

After 48 h of CCL₄ administration the blood was obtained from the animals by puncturing retro orbital plexus. The blood samples were allowed to clot for 45 mnts at room temperature. The serum was separated by centrifugation at 2500 rpm at 30C for 15 mnts and utilized for the estimation of various biochemical parameters including SGOT, SGPT, ALP, LDH, Total Bil., Direct Bil. After collection of blood samples, the animals were sacrificed under deep ether anesthesia and their liver were excised immediately and washed with ice cold saline and a 10% homogencate prepared in phosphate buffer (PH 7.0). The homogenate was centrifuged at 3000 rpm for 15mmts at 4C and the supernatant was used for the estimation glutathione and lipid peroxidation.

Statistical significance

The results of the study were expressed as mean ±SEM, n=6. ANOVA was used to analyse and compare the date, followed by dunnett’s test for multiple comparisons.
RESULTS

Preliminary phytochemical studies the presence of various phytochemicals in aqueous extract of A.Paniculata was found to be nontoxic up to a dose of 200 mg/kg. CCL4 caused significant evaluation of serum liver enzymes and bilirubin treatment with A.Paniculata (100,200 mg/kg) caused significant hepatoprotective effects was almost comparable to that of silymarin, the known hepatoprotective agent.

Table 1: Effects of aqueous extract of A.Paniculata on biochemical parameters viz. SGOT, SGPT, ALP, LDH, Tot.Bil, Dir.Bil

<table>
<thead>
<tr>
<th>Groups</th>
<th>SGOT (U/ml)</th>
<th>SGPT (U/ml)</th>
<th>ALP (U/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Vehicle control</td>
<td>65.54 ± 2.18</td>
<td>12.50 ± 1.29</td>
<td>170.25 ± 2.81</td>
</tr>
<tr>
<td>II Intoxicated</td>
<td>95.67 ± 2.93</td>
<td>32.31 ± 1.11</td>
<td>45.78 ± 2.81</td>
</tr>
<tr>
<td>CCL4</td>
<td>96.03 ± 2.34</td>
<td>45.19 ± 1.49</td>
<td>45.93 ± 2.81</td>
</tr>
<tr>
<td>III Silymarin (50gm/kg)</td>
<td>72.56 ± 2.23</td>
<td>48.17 ± 2.83</td>
<td>48.67 ± 2.81</td>
</tr>
<tr>
<td>IV Extract of A.Paniculata (200 mg/kg)</td>
<td>10.46 ± 2.26</td>
<td>2.95 ± 0.75</td>
<td>2.76 ± 0.11</td>
</tr>
<tr>
<td>V Extract of A.Paniculata (50 mg/kg)</td>
<td>12.19 ± 0.15</td>
<td>3.21 ± 0.11</td>
<td>2.87 ± 0.03</td>
</tr>
<tr>
<td>VI Extract of A.Paniculata (100 mg/kg)</td>
<td>163.75 ± 0.15</td>
<td>2.87 ± 0.03</td>
<td>2.91 ± 0.11</td>
</tr>
</tbody>
</table>

Table 2: Effect of Extract on biochemical liver parameters in CCL4 induced hepatopatocity

<table>
<thead>
<tr>
<th>Groups</th>
<th>SOD (U/mg protein)</th>
<th>Catalase (U/mg protein)</th>
<th>GPx (U/mg protein)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>14.01 ± 0.27</td>
<td>0.4831 ± 0.02</td>
<td>13.05 ± 0.11</td>
</tr>
<tr>
<td>Toxicant</td>
<td>2.49 ± 0.09</td>
<td>0.0862 ± 0.01</td>
<td>2.16 ± 0.05</td>
</tr>
<tr>
<td>Extract-50</td>
<td>4.71 ± 0.08</td>
<td>0.1112 ± 0.02</td>
<td>3.13 ± 0.07</td>
</tr>
<tr>
<td>Extract-100</td>
<td>5.67 ± 0.10</td>
<td>0.1845 ± 0.02</td>
<td>5.03 ± 0.10</td>
</tr>
<tr>
<td>Extract-200</td>
<td>6.20 ± 0.03</td>
<td>0.2457 ± 0.02</td>
<td>6.66 ± 0.14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Groups</th>
<th>Total Protein(g/dl)</th>
<th>Albumin(g/dl)</th>
<th>Globulin(g/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>6.67 ± 0.22</td>
<td>3.83 ± 0.16</td>
<td>2.57 ± 0.22</td>
</tr>
<tr>
<td>Toxicant</td>
<td>5.38 ± 0.23</td>
<td>2.98 ± 0.19</td>
<td>2.33 ± 0.19</td>
</tr>
<tr>
<td>Extract-50</td>
<td>5.76 ± 0.13</td>
<td>2.95 ± 0.22</td>
<td>2.76 ± 0.11</td>
</tr>
<tr>
<td>Extract-100</td>
<td>5.65 ± 0.11</td>
<td>3.64 ± 0.10</td>
<td>2.47 ± 0.15</td>
</tr>
<tr>
<td>Extract-200</td>
<td>5.70 ± 0.24</td>
<td>3.09 ± 0.01</td>
<td>2.69 ± 0.19</td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study aqueous extract of A.Paniculata at the doses of 100,200 mg/kg caused a significant inhibition in the levels of SGOT,SGPT,ALP,LDH, Tot.Bil,Dir.Bil. Towards the respective normal range and this is indication of stabilisation plasma membrane as well as repair of hepatic tissue damage caused by ccl4.

CONCLUSION

It can be concluded that the aqueous extract of A.Paniculata have significant hepatoprotective on CCL4, induced hepatic damage(14,15) in rats, as evidence by the biochemical parameters.further work is in progress to isolate and characterise the active principles in these extracts. The result of this study demonstrate that A.Paniculata has a potent hepatoprotective action on CCL4 induced hepatic damage in rats.

REFERENCE
