HEPATOPROTECTIVE ACTIVITY OF TRICHOSANthes CUCUMERINA L.

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Received: 25 December 2014, Revised and Accepted: 30 January 2015

INTRODUCTION

In the last few decades, there is a tremendous growth in the area of herbal medicine. It is coming popularized in developing as well as in the developed countries due to its natural origin and also considering its lesser side-effects [1]. Herbal remedies provide a lot of drugs for the treatment of internal diseases, which are considered to be stubborn and incurable by other system of medicines.

It aims both to prevention and cure the diseases [2]. In an ancient system, the traditional medicines such as Siddha, Ayurveda, Chinese and Japanese have been approved for the prevention diagnosis and treatment for liver disorders. This effort is to prove scientific insight behind the traditional adoption. Better therapeutic effect, less toxicity, good patient compliance and cost efficiency are important reasons for choosing a drug from natural sources [3]. Ayurvedic and herbal medicinal products contain a combination of a number of chemical compounds that may give the predictable activity in amalgamation.

Trichosanthes cucumerina L. (F. Cucurbitaceae) are used to treat liver disorders. It is one of the ingredients in various Ayurvedic formulations used, especially for the treatment of liver disorders and also in other diseases [4]. This study was to evaluate the hepatoprotective effect of ethanolic extract of T. cucumerina L. (EETC) which acute hepatotoxicity was induced by paracetamol treatment.

METHODS

Drugs and chemicals

All reagents used in the procured were analytical grade.

Paracetamol tablet (Sun Pharmaceuticals Ltd.) purchased from a Drugstore. Total bilirubin, direct bilirubin, total proteins, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphate were assayed by using kits from Ecoline Diagnostic, New Delhi.

Plant collection

Fresh leaves of T. cucumerina L. was collected from the field of Komarapalayam and authenticated by Dr. P. Satyanarayana, Scientist D and Head Office In Charge, Southern Regional Centre, TNAU Campus, Coimbatore. Voucher specimen (No: JKKNCP/0102/12) has been deposited in the Department of Pharmacognosy, JKK Nataraja College of Pharmacy, Komarapalayam, Tamil Nadu, India.

Preparation of plant extracts

The dried leaves of extracted with alcohol and then alcoholic extract of each plant were subjected to solvent extraction.

Ethanol extract of EETC

Fine powdered leaves of T. cucumerina L. was extracted successively with petroleum ether and ethanol (60-80°C) using soxhlet apparatus. The extract was filtered and evaporated to separate solvent and residue. The semisolid residue thus obtained was stored in a desiccator until further use.

Animals

Albino rats either sex weighing between 175±25 g were used in this evaluation. These rats aged between 2 and 2.5 months were procured from animal house located in JKK Nataraja College of Pharmacy, Komarapalayam. They were housed in well ventilated stainless-steel cages at room temperature (24±2°C) in hygienic condition under natural light and dark schedule and were fed on a standard laboratory diet. Food and water were given ad libitum.

Experimental protocol

Acute oral toxicity study

Acute oral toxicity study was followed by using Organization of Economic Co-operation and Development (OECD) Guidelines - 423 - Fixed dose procedure.

Acute toxicity study was performed for EETC according to the acute toxic classic method as per OECD (423) guidelines 5, albino rats were used...
Table 1: Hepato protective report of EETC

<table>
<thead>
<tr>
<th>S.No</th>
<th>Particulars</th>
<th>SGPT (U/ml)</th>
<th>SGOT (U/ml)</th>
<th>ALP (U/ml)</th>
<th>Total bilirubin (mg/dl)</th>
<th>Direct bilirubin (mg/dl)</th>
<th>Total protein (mg/dl)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Control</td>
<td>63.73±5.33</td>
<td>135.03±12.21</td>
<td>170.33±22.22</td>
<td>0.65±0.13</td>
<td>0.31±0.17</td>
<td>6.98±0.19</td>
</tr>
<tr>
<td>2.</td>
<td>Paracetamol (3 g/kg)</td>
<td>282.58±10.13</td>
<td>419.65±25.93</td>
<td>436.51±27.07</td>
<td>2.14±0.90</td>
<td>1.89±0.12</td>
<td>2.56±0.24</td>
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<tr>
<td>3.</td>
<td>Silymarin (100 mg/kg)</td>
<td>68.31±7.44</td>
<td>171.86±7.75</td>
<td>175.80±22.84</td>
<td>0.94±0.17</td>
<td>0.34±0.16</td>
<td>5.87±0.25</td>
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<tr>
<td>4.</td>
<td>EETC (150 mg/kg)</td>
<td>218.83±14.12</td>
<td>419.65±25.93</td>
<td>226.10±17.39</td>
<td>1.09±0.50</td>
<td>0.79±0.13</td>
<td>4.90±2.40</td>
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</tbody>
</table>

Values are expressed as mean±SD of six animals in each group. Statistical analysis ANOVA followed by Dunnett t-test. N=6 *p<0.01 as compared with control, †p<0.01 as compared with standard, SD: Standard deviation, EETC: Ethanolic extract of Trichosanthes cucumerina L, SGPT: Serum glutamate pyruvate transaminase, SGOT: Serum glutamate oxaloacetate transaminase, ALP: Alkaline phosphatase

RESULTS AND DISCUSSION

The effects of EETC of SGOT, SGPT, alkaline phosphatase, total bilirubin, direct bilirubin and total protein levels in rats with paracetamol-induced liver damage were summarized in Table 1. Administration of paracetamol (3 g/kg body weight, orally) after 24 hrs resulted in a significant (p<0.01) elevation of hepatospecific serum markers such as SGPT, SGOT, total bilirubin, direct bilirubin and total protein in the paracetamol group (Group II) in comparison (Groups III and IV) and paracetamol with the control group (Group I). On administration of the silymarin group (Group III) and EETC (Group IV), the serum markers were restored to the normal levels.

Histopathology analysis

The light microscopy examination of the transverse section of paracetamol treated and extract treated rats livers were shown in Fig. 1a-d. Fig. 1b shows the liver of paracetamol intoxicated rats shows a wide necrosis across the cells. The liver sections of the paracetamol intoxicated rats showed necrosis, ballooning and degeneration in the hepatic plates and loss of the cellular boundaries and karyolysis. Accumulation of neutrophils also found. In the liver section of standard drug silymarin treated rats, normal hepatocytes and lobular structure are observed in hepatocytes which may be due to the effective mechanisms in Fig. 1c.

Fig. 1d (EETC) shows the histological architecture of treated liver sections with a mild degree of degeneration and necrosis and indicated the moderate effect. The hepatocytes nuclei are at the recovery stage, and there are very minimal numbers of neutrophils, infiltration of lymphocytes and fatty changes.

REFERENCES