ABSTRACT

Objective: The present report is an investigation of anti seizure activity of Mussaenda frondosa in male Wistar albino rats by using Cobalt induced Epilepsy. Method: The MEMF at doses of 200 and 400mg/kg, p.o and the standard drug Silymarin (100mg/kg, p.o) were administered three times at 12h intervals and then Cobalt (1ml/kg) was administered to all the groups except normal control for 2 days. The antiseizure activity was assessed by using various biochemical parameters histopathological studies were observed after 36h of Cobalt treatment. Results and Discussion: The MEMF at the doses of 200 and 400mg/kg inhibited Cobalt induced brain toxicity in Wistar albino rats as assessed by the biochemical changes and histopathological studies. Conclusion: The methanolic extract of aerial parts of Mussaenda frondosa afforded significant protection against Cobalt-induced epileptogenic cortex injur

KEYWORDS: Mussaenda frondosa Brain toxicity, Sylimarine.

INTRODUCTION

Brain diseases are associated with distortion of these metabolic functions.[1,2] Although viruses are the main cause of Brain diseases, Thus to maintain a healthy Brain is a crucial factor for overall health and well beings.[5] Thus, Brain diseases remain one of the serious health problems and its disorders are numerous with no effective remedies.[6-8] There is no rational therapy available for treating Brain disorders and management of Brain diseases is still a challenge to the modern medicine.[9,10] The use of natural remedies for the treatment of various hepatic diseases has a long history and medicinal plants and their derivatives are still used all over the world.[4]
Mussaenda frondosa J.W. Moore (Family - Rubiaceae) is a shrub to small tree up to 10 m tall. Leaves are opposite, short petiolate, ovate, 8-25 cm long and hairy. Flowers are tubular, usually yellowish orange, subtended by 1 white or yellowish conspicuous leaf-like sepal, the flowers borne in dense terminal clusters. Fruit a green berry up to 20 mm long. Flowers and fruits are available throughout the year. It is common in forest clearings, secondary forests, and open ridges from sea-level to mid-montane. It is distributed indigenous and common from Vanuatu eastwards to the Society Islands. Traditional used to improve fertility and to relieve vaginal pain. To treat respiratory illness, severe pain (during pregnancy), rheumatic aches, sore throat, toothache, diarrhoea, and Brain trouble.\[11,12\]

MATERIALS AND METHODS

Plant collection
The aerial parts of Mussaenda frondosa were collected from Tirupati, Andhra Pradesh, in the month of August 2010. The plant was authenticated by Prof. P. Jayaraman, Director of National Institute of Herbal Science, W.Tambaram, Chennai.

Preparation of plant extract
The aerial parts of Mussaenda frondosa were dried in shade and pulverized in grinder-mixer to obtain a coarse powder. A weighed quantity (210 gm) of the powder was subjected to continuous hot extraction with methanol in Soxhlet apparatus for 48 h. The percentage of yield of methanolic extract of Mussaenda frondosa was found to be 32.91% w/w.

Animals used
Male Wistar albino rats (150-200 g) were obtained from the animal house in University college of pharmaceutical Sciences, Kakatiya university, Warangal. Ethical committee clearance was obtained from IAEC (Institutional Animal Ethics Committee) of CPCSEA.

Acute Toxicity Study
The acute toxicity methanolic extracts of Mussaenda frondosa were determined as per the OECD guideline no. 423 (Acute Toxic Class Method).

Cobalt-Induced Epileptogenic Cortex in Rats
The brain protective effect was evaluated using the Cobalt induced-epilepsymodel described by Rao and Mishra.\[14\] Wistar albino rats (150-200 g) were divided into five groups and were subjected to the following treatments received vehicle only group-I served as normal control.
Group-II served as untreated group; received only Cobalt, to assist assessing the severity of toxicity produced by carbon tetrachloride administration. Groups III-V served as treated groups; received MEMF at the dose of 200 and 400mg/kg, p.o. and standard drug Silymarin at a dose of 100mg/kg, p.o. were administered orally to rats of the respective groups three times at 12h intervals.

Anti Sezure Activityof Mussaenda Frondosa Extracts Cobalt-Induced Epileptogenic Cortex in Rats

<table>
<thead>
<tr>
<th>Treatment (mg/kg)</th>
<th>No. convulsed/ no. used</th>
<th>Onset of convulsion (sec)</th>
<th>Duration of convulsion (min)</th>
<th>No. of deaths</th>
<th>Protection (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8/8</td>
<td>120α5.0</td>
<td>40α3.1</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Extract (10)</td>
<td>8/8</td>
<td>120α4.0</td>
<td>58α4.2</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>(20)</td>
<td>4/8</td>
<td>122α2.0</td>
<td>**240α2.2</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>(40)</td>
<td>2/8</td>
<td>130α6.4</td>
<td>**240α4.8</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>(60)</td>
<td>0/8</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Extract (10) +</td>
<td>0/8</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Chlopromazine (5)</td>
<td>0/8</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Extract (10) +</td>
<td>0/8</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>100</td>
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<tr>
<td>Amphetamine (3)</td>
<td>0/8</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Values are expressed as mean±SEM
*P<0.05
**P<0.01; compared with control.

Statistical Analysis
The Significance of differences among the group was assessed using one way and multiple way analysis of variance (ANOVA). The test followed by Tukey-Kramer multiple comparison tests, the p values less than 0.05 were considered as significance.

RESULTS
Acute toxicity study
In the acute toxicity study, the animals treated with the MEMF at a higher dose of 2000 mg/kg did not manifest any significant abnormal signs, behavioral changes.

DISCUSSION AND CONCLUSION
The present studies were performed to investigate the antiseizure activity of methanolic extract of aerial parts Mussaenda frondosain rats against carbon tetrachloride to prove its claims in folklore practice against Brain diseases.
Cobalt induced-epilepsy is one of the most commonly used brain toxicity levels in the experimental study of Brain diseases. Cobalt is potent hepatotoxin producing centrilobular hepatic necrosis. The flavonoids constituents possess free radical scavenging properties.

It was found that the animal groups which are pretreated with MEMF at the dose of 200 and 400mg/kg (groups-III and IV) as well as silymarin at the dose of 100mg/kg (group-V) for three times at 12h. intervals, resulted in significantly decreases animals treated only with Cobalt (group-II). These results give us the suggestion that, the animals which are pretreated with MEMF as well as silymarin, showed a protection against the injurious effects of Cobalt that may results from the interference with cytochrome P-450. These biochemical restoration may be due to the inhibitory effects on cytochrome P-450 or/and promotion of its glucuronidation.

In the Brain section of rats treated with MEMF showed the ability of MEMF to prevent seizure activity necrosis, thereby further confirming the significant hepatoprotective effect of aerial parts of Mussaenda raiateensis.

Literature review revealed that various chemical investigations were carried out with this plant. The antiseizure activity of Mussaenda frondosa may be attributed due to presence of these constituents. It is concluded from the data, that the methanolic extract of aerial parts of Mussaenda frondosapossesses significant antiseizure activity and may prove to be effective for the treatment of Brain disorders.

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