A STUDY ON ANALGESIC EFFECT OF HEMIDESMUS INDICUS

Pharmacology

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ABSTRACT

BACKGROUND: Hemidesmus indicus is one such important herb popularly known as Indian sarasaparilla It is said to possess analgesic effect.

AIM: The present study investigates the analgesic activity of the crude extract of Hemidesmus indicus

METHODS: Analgesic effect was evaluated using Eddy's hot plate and Tail clino method in mice. Institutional animal ethical clearance was obtained.

RESULTS: The analgesic effect was seen following oral administration of aqueous and ethanolic extract of Hemidesmus indicus, shown prolongation of reaction time and reduction in the number of attempts to dislodge the tail clip by mice. The hot plate method showed a statistically significant prolongation in the reaction time. The effects of both aqueous and ethanolic extract of Hemidesmus indicus are comparable with that of diclofenac sodium.

KEYWORDS

Analgesic effect, Rats, Diclofenac, Tailoclip, Hot plate, Hemidesmus indicus

1. INTRODUCTION:

Pain is an unpleasant sensation localised to a part of the body. It is often described in terms of a penetrating or tissue destructive process (eg. Stabbing, burning, twisting, tearing, squeezing) and/or of a bodily or emotional reaction (eg. terrifying, nauseating, sickening). Any pain of moderate or higher intensity is accompanied by anxiety and the urge to escape or terminate the feeling. When acute pain is characteristically associated with behavioural arousal and a stress response consisting of increased blood pressure, heart rate pupil diameter and plasma cortisol level [1]. Pain may be somatic, visceral, referred or neuropathic. It is a subjective symptom which is affected by variety of psychological factors. So pain can be reduced by reassurance, by hypnotic, and by trance like meditative states. However it is emphasized that management of pain by prescribing narcotic and non-narcotic analgesics is of great importance.

Narcotic analgesics are particularly indicated for the relief of visceral pain, post operative pain, severe pain in trauma and the pain of advance malignant diseases. These analgesics all act as complete or partial agonist at opioid receptors thereby inhibit both the spinal and central processing of pain sensation. Fears of the physiological effects of the narcotics are often coupled with concern on the part of the clinician, patients or family that patient will become addicted or tolerant to narcotics used in pain management. Non narcotic analgesics are thought to act peripherally. But there may be central components to their action. They inhibit cyclo-oxygenase and in turn inhibits the inflammatory activities.

Hemidesmus indicus is one such important herb popularly known as Indian sarasaparilla, Which is easily available in our country. Studies have reported that Hemidesmus indicus has high degree of effectiveness against syphilis leucorrhoea, skin disorders gout dyspepsia etc[2].It has also been found to have efficacy against rheumatic pain and boils[3],and the root decoction has been found to relieve inflammation and ulcers of the alimentary tract.Present study was undertaken to evaluate the analgesic effect of Hemidesmus indicus on various experimental models following systemic administration.

2. AIM:

To evaluate the analgesic activity of aqueous ethanolic extract of Hemidesmus indicus.

3. METHODS & MATERIALS:

A) Drugs and Chemicals
   a. Extract of Hemidesmus indicus
   b. Polysorbate (Tween) 80
   c. Carrageenin
   d. Diclofenac sodium

B) Animals: Albino mice

3.1. Methology

1) Ethanolic Extract

250 G of the powdered roots of Hemidesmus indicus was extracted with 95% alcohol for 24 hours using soxhlet apparatus. The solvent was evaporated under reduced pressure. The residue obtained (8.5G) was brown in colour with pleasant odour.

2) Aqueous Extract

250 G of the powdered roots of Hemidesmus indicus was refluxed for 24 hours in a round Bottomed flask with distilled water and filtered. The filtrate was evaporated to dryness. The residue obtained (10G) was kept in a dessicator for 48hours. It was dark brown coloured with pleasant characteristic odour[4].500mg extract was dissolved in 50ml of the solvent. The solution was prepared to provide 10mg per ml.

Polysorbate (Tween)80 [5]

It is a non-ionic surface active agent. It is lemon to amber coloured, oily liquid and bitter in taste. Specific gravity is about 1.07 to 1.09 and...
PH is 6 to 8. These agents are inert and used as a solubilizing agent for water insoluble substances for administering test compounds.

Diclofenac Sodium. The solution of diclofenac sodium was prepared to provide 1mg/ml.

Assessment of Analgesic and Antiinflammatory Activities
A) Analgesic activity
The analgesic property of H. indicus was evaluated in mice using two methods – physical and thermal.

1. Tail clip: (Mechanical Stimulus)[6]
A bull dog clamp with thin rubber sleeves was applied to the base of the tail for 30 seconds. The mice make continuous efforts to dislodge the clip by biting it. Unresponsive mice are screened out by testing all the twenty four mice with tail clip. Those that do not make continuous efforts to remove the clip within 15 seconds are rejected. The animals were divided into four groups of six each and were administered drugs orally as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Drug</th>
<th>Reaction Time</th>
<th>No of attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Control received tween 80-0.2ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Diclofenac sodium – Dose – 8 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Aqueous extract of Hemidesmus indicus – 100 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Ethanolic extract of Hemidesmus indicus – 100 mg/kg</td>
<td></td>
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</tbody>
</table>

A bulldog clamp was applied 30 minutes after drug administration. The reaction time and number of attempts will be noted in each group. A significant increase in reaction time and reduction in the number of attempts to dislodge the clip implies the presence of analgesic effect.

2. Eddy’s Hot plate Method (Thermal Stimulus)[7]
Janseen and jagenean employed this technique to detect analgesic effect by thermal stimulus. Twenty four albino mice weighing 20-30 grams were selected. The Hot – Place was maintained at 55°C. The reaction time is that between placing the animal on the hot plate and beginning of licking of forepaw or hind paw was recorded for all the mice prior to administration of drugs. A cut off time of 30 seconds is followed to avoid any thermal injury to the paws.

The animals were divided into four groups of six each and were administered the drugs orally.

<table>
<thead>
<tr>
<th>Group</th>
<th>Drug</th>
<th>Reaction Time</th>
<th>No of attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Control – Tween 80 -0.2ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Diclofenac sodium</td>
<td>4±1.22</td>
<td>11±1.5*</td>
</tr>
<tr>
<td>III</td>
<td>Aqueous extract of H.indicus</td>
<td>4.6±1.03</td>
<td>13.3±1.86*</td>
</tr>
<tr>
<td>IV</td>
<td>Ethanolic extract of H.indicus</td>
<td>4.8±1.36</td>
<td>13.1±2.31*</td>
</tr>
</tbody>
</table>

Values are mean ± S.D.n -6 *p<0.05

5. DISCUSSION & CONCLUSION:
Inflammation represents a series of homeostatic events that have evolved to aid in our survival in the face of pathogens and tissue injury. Viewed in this context better anti–inflammatory therapy runs the risk of blocking such events and thereby doing more harm than good. Beyond the global issue of survival blockade of physiologically important mediators [such as prostaglandin, leukotriene, cell adhesion molecule or cytokine mediated events] will be associated with some degree of cellular and organ system toxicity, thus it may be difficult or impossible to avoid toxicity with anti-inflammatory drugs targeted against such mechanisms. Due to disadvantage with the use of NSAIDs recently more light is being thrown on the use of herbal remedies in the treatment of acute and chronic inflammatory disorders which are associated with lesser systemic toxicity. One such plant namely hemidesmus indicus has been evaluated in this study for its anti-inflammatory and analgesic properties. The findings of the present study pertaining to the effect of aqueous and ethanolic extract of Hemidesmus indicus exhibits analgesic activity. The analgesic effect as evidenced following oral administration of aqueous and ethanolic extract of Hemidesmus indicus has shown prolongation or reaction time and reduction in the number of attempts to dislodge the tail clip by mice. The hot plate method showed a statistically significant prolongation in the reaction time. The effects of both aqueous and ethanolic extract of Hemidesmus indicus are comparable with that of diclofenac sodium. The analgesic response was evidenced by a prolongation of reaction time which was comparable with that of diclofenac sodium. Further research should be aimed at isolating the active principle responsible for the analgesic activities.
7. REFERENCES:


4. Evans WL. Ed. trease and evans pharmacognosy. Ed.2002; WB Saunders co., pp 139-149

