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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 Eddys hot plate and Tail clio method in mice . Institutional animal ethical clearance was obtained
RESULTS: The analgesic effect was seen following oral administration of aqueous and ethanolic extract of Hemidesmusindicus, 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 (e.g 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 sympotom which is affected by variety of psychological factors. So pain can by reduced by reassurance, by hypnosis, 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 opiod 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 formation of the prostaglandin synthesis.

The inhibition of prostaglandin synthesis is thought to remove the effect of prostaglandins in lowering the threshold and makes them less sensitive to painful stimuli. Non-narcotic/Non-steroidal anti-inflammatory drugs (NSAIDs) are efficacious in providing symptomatic relief but all available agents have been associated with toxicities. These agents are highly useful for the treatment of acute, self limited inflammatory conditions. However their ability to modify disease progression in chronic inflammatory setting is not well documented and remain an area of continuing controversy. To overcome these problems the most important advancement in anti-inflammatory drugs has been the identification of selective inhibitors of cyclo-oxygenase-2 (COX-2) the inflammation induced form of the enzyme. Even though these drugs have high degree of safety, the post marketing surveillance and further studies should shed light on whether or not the safety of these drugs is sustained during chronic ling term therapy. So research is going on to find out drugs with potent analgesic and anti inflammatory action with less side effects. In this process plants are being increasingly screened for possible anti-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 Hemidesmusindicus
b. Polysorbate (Tween) 80
c. Carrageenin
d. Diclofenac sodium
B) Animals: Albino mice

The root of Hemidesmusindicus was collected locally from Alagarkovil hills. Madurai district. Tamilnadu. The roots were thoroughly washed, dried in shadow and powdered.
Extract of Hemidesmus indicus

1) Ethanolic Extract

250 G of the powdered roots of Hemidesmusindicus 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 Hemidesmusindicus 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 administing test compounds.

Diclofenac SodiumThe Solution of dielofenac 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:

Group I Control – received tween 80-0.2ml
Group II-Diclofenac sodium – Dose – 8 mg/kg
Group III Aqeous extract of Hemidesmusindicus – 100 mg/kg
Group IVEthanolic extract of Hemidesmusindicus – 100 mg/kg

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 clamp 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^{0}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.

Group IControl – Tween 80 -0.2ml
GroupIIDiclofenac sodium 8mg/kg
Group III:Extract of Hemidesmus indicus(Aqueous) 100mg/kg
Group IVExtract of Hemidesmus indicus (Ethanolic) 100 mg/kg

The reaction time was noted 30 minutes after drug administration and the results were tabulated.A significant increase in reaction time implies the presence of analgesic effect

Statistical Analysis
All data were subjected to statistical analysis, using the student's t- test for significant difference between control and experimental animals.

4.RESULTS :
ANALGESIC EFFECT OF AQUEOUS EXTRACT OF HEMIDESMUS INDICUS IN MICE
Tail clip method

Aqueous extract of Hemidesmus indicus administered orally in the dose of 100mg/kg body weight to mice showed that the reaction time was prolonged and number of attempts to dislodge the clip was reduced.The mean reaction time and number of attempts after administration of aqueous extract of Hemidemus indicus were 28.8±4.26 and 4±0.89 respectively and the 'p' value was found to be < 0.05 which is statistically significant.

TABLE No:1 Analgesic activity of H.indicus -Tail Clip Method

Group	Drug	Reaction Time	No.of attempt		
		BD	AD	BD	AD
1	Tween 80	3.5±1.05	3.6±0.80	12±2.09	13±1.41
2	Diclofenac	3.6±0.80	16±5.09*	13±1.54	4±1.09*
3	Aqueous exract of H.indicus	3.6±0.80	28.8±4.26 *	13±1.54	4±0.89*
4	Ethanolic extract of H.indicus	4.0±1.41	15.3±4.63 *	13±1.67	4±1.26*

Values are mean ± n=6 *p< 0.05
Hot plate Method
Aqueous extract of H.indicus administered orally in the dose of 100mg/kg body weight to mice showed that the reaction time was prolonged and the mean reaction time was found to be 13.3±1.86. The 'P' value was found to be < 0.05 which is statistically significant.

TABLE No: 2 Analgesic activity of H.indicus -Hot Plate Method

Group	Drug	Reaction Time	
		Before Drug	After Drug
1	Tween 80	5±1.00	5±1.48
2	Diclofenac	4.5±1.22	11±1.5*
3	Aqueous exract of H.indicus	4.6±1.03	13.3±1.86*
4	Ethanolic extract of H.indicus	4.8±1.36	13.1±2.31*

Values are mean ± S.Dn -6 *p<0.05

ANALGESIC EFFECT OF ETHANOLIC EXTRACT OF H.INDICUS IN MICE
Tail Clip Method
Ethanolic extract of Hemidesmusindicus administered orally in the dose of 100mg/kg body weight to mice after application of tail clip showed that the reaction time was prolonged and number of attempts to dislodge the clip was reduced.The mean reaction time after administration of ethanolic extract of H.indicus was 15.3±4.63 and the number of attempts to dislodge the clip was 4 ±1.26. The 'P' value was found to be < 0.05 which is statistically significant.

Hot Plate Method: Ethanolic extract of H.indicus administered orally in the dose of 100mg/kg body weight to mice after induction of pain by thermal method (Eddy's hot plate) showed that the reaction time was prolonged and the mean reaction time was found to be 13.1±2.31. The 'P' value was found to be <0.05 which is statistically significant. Tween 80 was used as a vehicle and the effects of both the ethanolic and aqueous extracts of H.indicus were compared with diclofenac sodium as a standard, which showed a mean reaction time of 16±5.09 and number of attempts was found to be 4±1.09 by tail clip method and a mean reaction time of 11±1.5 by hot plate method. The 'P'value was found to be <0.05 which is statistically significant.

5. DISCUSSION & CONCLUSION:
Inflammation represent 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 Hemidesmusindicus 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.

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