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TO EVALUATE THE ANALGESIC ACTIVITY OF ETHANOLIC LEAF EXTRACT OF MORINGA OLEIFERA PLANT IN ALBINO WISTAR RATS

KEYWORDS

Antinociception, Diclofenac, Moringa Oleifera, Tail-flick Latency

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ABSTRACT Introduction: Moringa Oleifera is widely found in Asian subcontinent and it has been used as an analgesic and anti-inflammatory in Indian folk medicine. In this study we compared the analgesic effects of Moringa Oleifera Ethanolic extracts with standard drug Diclofenac in Wistar Albino Rats by Tail flick method . Methods: Male Wistar albino rats were divided into 5 groups and administered placebo (saline) ,Diclofenac and 3 groups of Moringa Oleifera using 100mg/Kg, 200mg/Kg and 400mg/kg doses. Results: Moringa Oleifera 400 mg/Kg produced significant antinoceptive action by enhancing Tail-flick latency period at 30 min, 60 min and 120 min. Moringa Oleifera (200mg/Kg) also produced significant antinocipetive action by enhancing tail-flick latency period at 30 min, 60 min and 120 min . The Standard Drug Diclofenac increased the latency period of Tail-flick response sustained all throught the period Conclusion: Ethanolic Extracts of Moringa Oleifera leaves exhibits significant antinociceptive activity by Tail-flick Latency model in a dose dependent manner. However the amount of antinociceptive action produced was lesser as compared to standard drugs like Diclofenac .

Introduction: Moringa oleifera belongs to Moringaceae family .There are 13 species of the family out of which Moringa oleifera has become the most used and studied. [1]

Ayurvedic traditional medicine mentions that Moringa oleifera can prevent 300 diseases and its leaves have been used both for preventive and curative purposes [2].Moringa is among the species utilized by traditional Siddha healers [3]. Ancient Egyptians used Moringa oleifera oil for its cosmetic value and skin preparation [4]; even the species became popular among Greeks and Romans, [5]. Moringa Oleifera has been dubbed "miracle tree", or "natural gift", or "mother's best friend". In India, herbal drugs are an integral part of The Indian System of Medicine (Ayurveda) which is an ancient and mainstream system[6].

Moringa is one such species which has not been explored fully despite the enormous reports having potentials such as: cardiac and circulatory stimulants; antitumor; antipyretic; antiepileptic;[7]anti-inflammatory, diuretic antispasmodic;[8] antiulcer[9];diuretic antihypertensive; cholesterol lowering;[10] antioxidant; antidiabetic; , antitumour ,hepato- protective; antibacterial and antifungal activities[11]. These are also being used for treatment of different ailments in the indigenous system of medicine[12] The leaves are used in folklore medicine for the treatment of pain. Some previous reports indicate that ethanolic extract of the leaves possesses significant antinociceptive activities. Therefore the present study is aimed to evaluate the analgesic activity of ethanolic leaf extract of moringa oleifera plant in Albino Wistar Rats using Tail flick method.

MATERIALS AND METHODS

Plant Material and Extraction

Fresh leaves of *Moringa oleifera* of were collected from periphery of Aurangabad city and its identity was confirmed by Dept. of Botany , Maulana Azad College Aurangabad. Leaves were dried in the shade inside the room for two days and later made into powder. 90% ethanol was used to extract the powder using the method of soxhlation for 18 hrs. Whitman filter paper No. 1 was used to filter the extract and concentrated to yield a semi solid mass of 48 gm (yield 9.2% w/w). and was refrigerated at 4°C and for later use .

Chemicals Diclofenac (VOVERAN, NOVARTIS, Worli, Mumbai) and other solvent chemicals used were of analytical grade.

Animals

Animals were procured from central animal house of M.G.M. MEDICAL COLLEGE AND Hospital AURANGABAD. Male Wistar Albino rats (100-200 g) were used. Food, water given ad libitum. Animals were acclimatized for laboratory conditions for 7 days before the experiments. The experimental study protocol was approved by the Institutional Animal Ethics Committee (IAEC) of MGM MEDICAL COLLEGE constituted as per the guidelines laid by the committee for the purpose of control and supervision of experiments on Animals (CPCSEA).

Methods

30 Male Albino Wistar Rats were taken.They were divided into 5 groups of 6 animals each First group of rats were considered as controls and treated with 0.2 ml normal saline orally . Second group were considered as standard and were treated with diclofenac, at dose of 10 mg/kg body weight was given intraperitoneally, Third to fifth group were considered as test and treated with Moringa Oleifera at dose of 100 mg/Kg , 200 mg/Kg, 400mg/Kg, orally to find best analgesic action. Model of pain was tail flick induced pain by Analgesiometer ((Elico India)) [13]. Tail Flick Latency (TFL) was tested at 0, 30, 60, 120 min. The basal reaction time was taken immediately after giving the drug at zero minute by keeping the tail on Nichrome wire. The time taken for the withdrawal of the tail was considered as Tail Flick Latency. The site of application of radiant heat on tail was measured from root to tail end . The antinociceptive activity was considered as positive if Rat fails to withdraw the tail. The cut of reaction time was fixed at 15 seconds to avoid tissue damage.

Results

In Group 1 there was no analgesic effect seen at 0 ,30, 60 and

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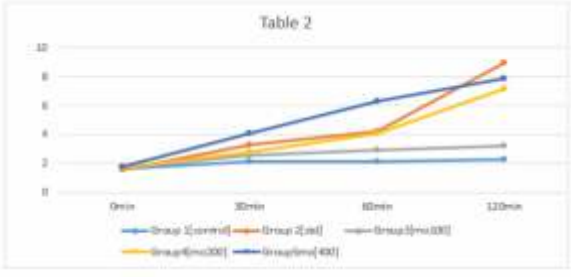
120 minutes. In group 2 the response to heat application was not seen at 0 minute interval but the reaction was slightly increased after 30 minutes which gradually increased after 60 and 120 minutes. In Group 3 at 0 minute there was no analgesic effect seen, but increased at 60 and 120 min. In Group 4 the analgesic effect was increased between 60 and 120 minutes. In Group 5 the analgesic effect was not seen at 0 minutes but increased progressively from 30 minute to 60 min and up to 120 min .

The highest reaction time was observed in Group 2 and Group 5 at 120 min . At all time of point, the tail-flick latency time differed significantly between the extract and Diclofenac Groups being greater in the Group 2 .

Table 1 Analgesic activity by tail flick method

Groups	0min	30min	60min	120min
Group 1[control]	1.61 ± 0.12ns	2.11 ±0.14ns	2.16 ±0.12ns	2.26 ± 0.10ns
Group 2[std]	1.56 ± 0.12*	3.3 ± 0.26 **	4.23 ± 0.15**	8.98 ± 0.26**
Group3[mo100]	1.7 ± 0.08*	2.58 ± 0.20*	2.93 ± 0.18**	3.23 ± 0.16**
Group4[mo200]	1.71 ± 0.11 *	2.8 ± 0.18**	4.06 ± 0.16**	7.16 ± 0.17**
Group5mo[400]	1.8 ± 0.14 *	4.1 ± 0.43 **	6.3 ± 0.26**	7.88 ± 0.45**

* p<0.01 – significant, **P<0.001 -- Highly significant



Discussion and conclusion

Considering the costs imposed to the society by the pain relief treatments, and having the knowledge about the numerous side effects of the available analgesics in the clinical practice, the need for new analgesic drugs with higher efficacy and fewer side effects seems imperative . The effect of the extract in our study by tail flick response provides a confirmation of the analgesic effect of moringa olefera leaf . Moringa olefera showed a central anti nociceptive activity by increasing the latency to discomfort and may act like centrally active drugs, probably by activating the periaqueductal grey matter (PAG) to release endogenous peptides (i.e., endorphin or enkephalin). These endogenous peptides probably descend to spinal cord and function as inhibitors of the pain impulse transmission at the synapse in the dorsal horn.

The ability of the extract to increase tail flick latency confirms the analgesic activities of the extract. This test confirms the anti-nociceptive action of Ethanolic extract of Moringa, which could be due to inhibition of prostaglandin synthesis. There is also a possibility that the anti-nociceptive action of Ethanolic extract could be due to inhibition of cytokines like TNF- , IL-1 , IL-8. The data of ethanolic extract of Moringa olefera possesses analgesic properties, which are probably mediated by both central and peripheral inhibitory mechanisms as well as via inhibition of prostaglandin synthesis.Phytochemical ingredients like flavonoids, saponins, tannins, terpenoids present in the leaf could be contributed to its analgesic action.[14] The plant can therefore offers a potential benefit in the management of pain disorders. However, further research is needed to explore the active ingredients contributing to its activities and elucidate the exact mechanism of action of this plant.

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