INTRODUCTION

Curcumin is the active ingredient of turmeric. It belongs to the family Zingiberaceae. Curcumin has been extensively used in Ayurveda and traditional Indian System of Medicine since a very long time. It has been observed that curcumin has a lot of benefits on a person’s health, as discussed by Sodhi et al. [1]. It can act as an anti-inflammatory, as shown by Arora et al. [2], antibacterial, antipyretic, antioxidant, and analgesic agent. Studies done by Chandra et al. [3] and Deodhar et al. [4] showed that curcumin was effective in arthritis. It is also used in the treatment of fever, Alzheimer’s disease, skin conditions like acne, eczema, inflammatory bowel disease, heart diseases. Other studies done by Bose et al. [5] and Mehta et al. [6] also highlighted the beneficial activity of curcumin in the treatment of different types of cancer.

A few studies like that done by Jagetia et al. [7] have shown that turmeric when taken in the diet on a regular basis has helped to boost the immune system of an individual. Due to the excellent health benefits of turmeric, a lot of turmeric supplements have flooded the market.

Ibuprofen is a type of NSAID. They work by inhibiting the production of inflammatory mediators like prostaglandin which is responsible for causing pain, inflammation, and fever. Cooper et al. [8] studied the analgesic activity of ibuprofen. Ibuprofen and other NSAIDs are associated with a lot of side effects, including gastric ulcer and interstitial nephritis on prolonged use.

The purpose of the study is to evaluate whether curcumin present in turmeric has got significant analgesic activity and can be used as an alternative to the conventional NSAID’s in the treatment of painful conditions.

METHODS

The study was conducted in the Department of Pharmacology, Gauhati Medical College and Hospital after obtaining approval from the Institutional Animal Ethics Committee (No MC/68F/2009/MAR-19/02). Thirty healthy Wistar rats weighing between 150 and 200 g of either gender were selected and allocated in five groups. Each group comprised of six animals.

They were maintained on a pellet diet and water was given ad libitum. The animals were acclimatized for 1 week before the experiment. The duration of the study was 21 days.

Chemicals and drugs
1. Syrup ibuprofen (100 mg/5 ml)
2. Crude curcumin extract was purchased from HIMEDIA Laboratories Pvt. Limited (RM1449-10G).

Grouping of animals
Group 1 - (Control group): N/S 0.5 ml
Group 2 - (Standard drug): Syp ibuprofen 30 mg/kg
Group 3 – Test group – Curcuma longa crude extract 100 mg/kg body weight
Group 4 – Test group – C. longa crude extract 200 mg/kg body weight
Group 5 - Test group – C. longa crude extract 400 mg/kg body weight

The animals in Group 1 and Groups 3, 4, and 5 were administered drugs once daily for 21 consecutive days until the final day of the experiment.

Methods: Tail-flick analgesiometer

The reaction time (in seconds) was noted down, which was the time from the onset of placing the tail on the heated wire and flicking of the tail from the source of heat. The tail was not kept for more than 15 s to prevent thermal damage to the tail.
The study revealed that the mean reaction time at the end of 60 min was increased in Groups 2, 3, 4, and 5. Group 2 (ibuprofen 30 mg/kg) showed the highest increase in mean reaction time (11.4 ± 0.18 s). It was also observed that with the gradual increase in the dosage of curcumin, the mean reaction time also increased gradually. Group 5 (curcumin 400 mg/kg) produced nearly similar analgesic activity (mean reaction time −10.4 ± 0.15 s) as compared to Group 2 (ibuprofen 30 mg/kg) whose mean reaction time was 11.4 ± 0.18 s at the end of 60 min.

Studies done by Neha et al. [9] and Sharma et al. [10] showed similar results. Furthermore, *C. longa* (400 mg/kg) and ibuprofen (30 mg/kg) almost have comparable anti-nociceptive activity.

Other studies conducted by Ojewole et al. [11] and Hajare et al. [12] also revealed the analgesic activity of some other plant compounds such as *Zingiber officinale* and *Dalbergia sissoo* leaves similar to the analgesic activity exhibited by curcumin present in turmeric.

Other than analgesic activity, curcumin also possesses anti-inflammatory activity which has been demonstrated by Sulthana et al. [13] on osteoarthritis patients. Curcumin along with azadirachta indica was also shown to exhibit antifungal activity by Saini et al. [14].

**CONCLUSION**

From the study, we can conclude that curcumin has got significant analgesic activity with a gradual increase in its dose.

The anti-nociceptive activity of curcumin can be utilized to treat a lot of chronic pain conditions such as arthritis, cancer, diabetes, and multiple sclerosis and thereby minimize the use of NSAID’s which can have a negative impact on the health on prolonged use.

One major drawback of curcumin is that it has very poor oral bioavailability when given through oral route which can be effectively countered by giving curcumin with piperine or nanocurcumin formulations.

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**AUTHORS’ CONTRIBUTION**

All the authors contributed to the preparation of the final manuscript.

**CONFLICTS OF INTEREST**

None declared.

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