ANTI ULCER ACTIVITY OF *CURCUMA LONGA* AGAINST INDOMETHACIN INDUCED GASTRIC ULCERS IN ALBINO RATS

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ABSTRACT

In the present study, anti ulcer activity of *Curcuma longa* was evaluated against Indomethacine induced gastric ulcers in rats. The ulcers were produced by oral administration of indomethacin @ 15 mg/kg b.w. The extract of C. longa was given @ 600 mg/kg b.w. by oral route to the experimental albino rats. Ranitidine was used as standard drug. Alcoholic extract of C. longa significantly reduce the number and severity of the gastric ulcers by lowering ulcer index and ulcer score and increasing healing index indicating the ulcer protective action of *C.longa*.

KEY WORDS: *Curcuma longa,* indomethacin, gastric ulcer, ulcer score, healing index.

INTRODUCTION

Peptic ulcer occurs due to imbalance between the offensive (gastric acid secretion) and defensive (gastric mucosal integrity) mechanism. Ayurveda, Siddha and Unani are the well known traditional system of indian herbal medicines. Many herbs have shown to possess significant therapeutic properties and emerging as an alternative to costly and hazardous allopathic medicine.

Although a number of allopathic drugs have been developed for the treatment of gastric ulcers but none are safe and causes side effects. *Curcuma longa* commonly known as "Haldi" belongs to the family of Zingiberaceae has a long tradition of use in India as a house hold remedy. Curcuma longa have been reported to possess anti bacterial (Devi *et al.,* 2001), analgesic (Khung *et al.,* 1986), anti-arthritic (Chandra and Gupta, 1972), anti depressant (Yu, *et al.,* 2002) and anti oxidant activities (Subramanian *et al.,* 1994). Therefore, the present study was planned to evaluate the potential anti ulcer activity of *C. longa* in albino rats.

MATERIALS AND METHODS

The root sample of *C. longa* was collected from Aromatic and medicinal plant centre, J.N.K.V.V., Jabalpur (M.P.). For the experimental studies the roots were cut into small pieces and shade dried. Dried roots were powdered and alcoholic extract was prepared by cold percolation method of Harborne *et al.* (1998). Root powder was kept in ethanol for 48 hours and then filtered by Whatman filter paper No. 1.The excess of filtrate was evaporated to obtain a semisolid extract, which was kept in refrigerator at 4°C for further use.

The experiment was conducted on 24 healthy albino rats of either sex, weighing between 100-150 g. The rats were divided into four groups of six rats each. The rats were kept in colony cages under identical management conditions in the Department of Pharmacology and Toxicology, Veterinary College, Jabalpur. Before experimentation the rats were fasted overnight although water was given *ad libitum*.

Gastric ulcers in group I rats were produced by adminstering indomethacin (NSAID) at the dose rate of 15 mg/kg b.w. by oral route. Alcoholic extract of *C. longa* was administered orally in group

II rats at the dose rate of 600 mg/kg b.w., one hour prior to the administration of indomethacin. Group III rats were administered with indomethacin 15 mg/kg b.w. + Ranitidin @ 20 mg /kg b.w. Group IV rats served as control and normal saline was administered to them.

Twenty four hours after the administration of *C.longa* extract and Indomethasin treatment, all the rats were sacrificed and their stomach were collected. The stomach was incised at the greater curvature and observed under dissecting microscope to determine the presence and severity of ulceration. The presence of shedding of epithelium, petechial haemorrhage, one or two small ulcers, many ulcers and perforated ulcers were considered to be positive ulcerogenic response. Ulcers were categorized in an arbitatory grading scale of 0-4 (ulcer score) according to the severity of ulceration. The mean number of ulcerations per stomach and per cent incidence of ulceration was also determined. The ulcer index and healing index were calculated as per the method of Robert *et al.* (1968). Statistical analysis of the data was carried our as per method of Snedecor *et al.* (1994)

RESULTS AND DISCUSSION

Findings of the experiment revealed that except control group, in all the treatment group ulcers of varying severity were observed. The incidence was found to be 100% in all the three treatment groups i.e. I, II and III. The number of ulcers per stomach was 19±1.18 in indomethacin treated group I, whereas in C. longa treated group II and ranitidine treated group III, 13±0.57 and 6±0.56 ulcers respectively were observed.

Ulcer score, which indicates the severity was found to be highest (43.33±5.65) in indomethacin treated group I, and least in ranitidine treated group III (8.33±0.88). The ulcer score in the *C. longa* treated group II was found to be 23.16±1.49. This indicates that most severe ulcers were found in indomethacin treated group I and less severe ulcers were observed in the *C. longa* treated group II.

The ulcer index was found to be 79.0, 52.8 and 31.0 in indomethacin treated group I, *C. longa* treated group II and standard drug ranitidine treated group III respectively. Healing index indicates that the repair of ulcer induced by the given drug was highest (60.75) in ranitidine treated group III followed by *C. longa* treated group II with healing index 33.16.

C. longa extract provide protection against indomethacin induced gastric ulcer in rats. In the C. longa treated group not only significantly less number of ulcers was found but they were also less severe.

Our findings are in close agreement of the Swarnkar *et al.*(2004) who also reported the protective effect of *C. longa* on NSAID induced ulcers in albino rats. Saifee (2007) reported that *C. longa* @ 600 mg/kg b.w. protect the stomach of rats against diclofenac sodium induced gastric ulceration. Sinha *et al.*(1974) reported that the *C. longa* shows protective effect against phenylbutazone and 5-hydroxytryptamine induced gastric ulcer in guinea pig. Finding of the present study clearly suggest the significant anti-ulcreogenic activity of cold alcoholic extract of *C. longa*.

References

Chandra, D. and Gupta, S.S.(1972). Indian Med. Res. **60:** 138-142.

Devi, K. R., Mishra, P. R., Ray, S. H. and Kar, B.C. (2001). The Veterinarian. **25(4):**14-17.

Harborne, J.B. (1998). Phytochemical methods: A guide to modern techniques of plant analysis, Champman and Hall London. P: 4-6.

Khung, N., Rastogi G. and Grover, J.K. (1986). Ind. J. Pharmac.**18:** 19-21.

Robert, A., Nezamis, J.E. and Phillips J.P. (1968). Gastroentrol.**55:**481.

Saifee, B. (2007). Interaction studies of Curcuma longa and diclofenac sodium on anti-inflammatory activity in albino rats. M.V.Sc thesis, J.N.K.V.V., Jabalpur (M.P.).

Sinha M., Mukhergee, B. and Desgupta, S.R. (1974). Ind. J. Pharmacol.**6:**87.

Snedecor, G.W and Cochran, W.G. (1994). Statistical Methods, 8th edn. The Iowa State University Press Ames, Iowa, U.S.A.

Subramanian, M., Sreenayan, M., Rao, N. and Devasagayam, T.P., Singh, B.B.(1994). Mutat. Res.**311:**249-255.

Swarnkar, S., Ganguly, K., Kundu, P., Banerjee, A., Mity P. and Sharma, A. V. (2004).

J. Biol. Chem. **22:** 87-89.

Yu, Z. F., Kong, L. D. and Chen, Y. (2002). J. Ethnopahrmacol. **83:**161-165.

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