ORIGINAL RESEARCH PAPER
Volume-8 | Issue-11 | November - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF LANSOPRAZOLE IN ADULT MALE ALBINO RATS

Pharmacology

Dr. Saraswathi. S* Postgraduate student ,Institute of Pharmacology, Madurai Medical College *Corresponding Author
Dr. Raadhika. K. M.D., Associate Professor,Institute of Pharmacology, Madurai Medical College
Dr. Malathi. M. M.D., Assistant Professor, Institute of Pharmacology, Madurai Medical College
Dr. Shanthi. M. M.D.,Professor, Institute of Pharmacology, Madurai Medical College

ABSTRACT

Back ground- Inflammation plays a major role in many diseases such as osteoarthritis. Lansoprazole,a Proton pump inhibitor might have anti-inflammatory effect due to its chemical structure.
Objective- To evaluate the anti inflammatory effect of Lansoprazole in adult male albino Rats.
Methodology- The anti-inflammatory effect of graded doses of T.Lansoprazole (5 mg/kg ,10 mg/kg) was evaluated by 1% Carrageenan induced paw edema and measuring it using Plethysmometer.It was compared with the standard drug Aspirin. The values obtained were expressed as mean ± S.D. and percentage inhibition calculated. Statistical analysis of difference between groups was carried out using one- way Analysis of variance(ANOVA).Probability (P) value of < 0.05 was taken as the level of statistical significance.
Result - T.Lansoprazole at both doses of 5 mg and 10 mg produced significant inhibition of paw edema at a P-value of < 0.01.
Conclusion- T.Lansoprazole had anti inflammatory property both at 5mg/kg and 10 mg/kg dose and it was comparable to that of T.Aspirin 300mg/kg .

KEYWORDS

Anti-inflammatory,Lansoprazole,Carrageenan,Aspirin,Plethysmometer

1.INTRODUCTION

Inflammation plays an important role in many diseases such as rheumatoid arthritis and osteoarthritis. Non steroidal anti inflammatory drugs (NSAIDS) are the commonly used agents for the control of inflammation and pain associated with it. However continuous use of NSAIDS is associated with serious adverse effects like gastric mucosal damage, occult blood loss, salt and water retention , elevation of serum hepatic transaminases and also exacerbation of asthma [1]. Proton Pump Inhibitors (PPI) are strong antisecretory agents that act on gastric (H+/K+) ATPase of parietal cells.They are generally well tolerated and adverse effects are infrequent[2] Lansoprazole is a Proton Pump Inhibitor used extensively in acid related diseases including Gastroesophageal reflux disease and Peptic ulcer disease caused commonly by NSAIDS , Helicobacter pylori infection and stress[3]. Also Lansoprazole is safe for use in pregnancy and in children.

2.METHODOLOGY

The study was carried out in the Institute of Pharmacology, Madurai medical college, Madurai after getting clearance from the Institutional Ethical Committee (Ref.No.5/3152018). 24 inbred adult male albino rats were obtained from Central Animal House of Madurai Medical college. The animals had free access to food and water ad libitum. They were divided into four groups of 6 each (control,standard,Test-1 and Test-2). Initial paw volume was measured by plethysmometer . The following drugs were given to the animals:

Control -Distilled water
Standard -T.Aspirin 300 mg/kg(oral)
Test-1 -T.Lansoprazole 5 mg/kg(oral)
Test-2 -T.Lansoprazole 10 mg/Kg(oral)

One hour after the drug administration inflammation was induced by 0.1 ml of 1% carrageenan injected into the sub plantar plane of right hind paw .Paw volume up to the ankle joint was measured using a plethysmometer at 1,2and 3 hours after carrageenan. The values obtained were expressed as mean ± S.D. and percentage inhibition of paw edema calculated by

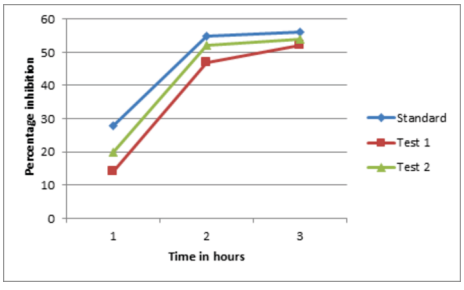
$$\frac{\text{Mean edema in control-mean edema in test} \times 100}{\text{Mean edema in control}}$$

3.RESULTS

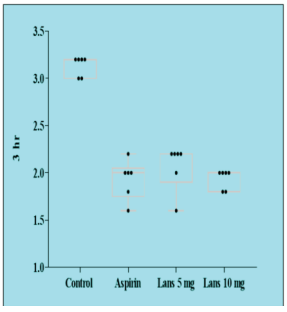
Statistical analysis of differences between groups was carried out using one-way analysis of variance (ANOVA). Probability (P) value of <0.05 was taken as the level of statistical significance.

Table-1 PERCENTAGE INHIBITION OF PAW EDEMA

Group	Standard	Test-1	Test-2
% inhibition at 1st hr	28%	14%	20%
% inhibition at 2nd hr	55%	47%	52%
% inhibition at 3rd hr	56%	52%	54%



Graph 1 Percentage inhibition of inflammation



Graph 2 Box-Whisker plot of 3 hr readings of paw volume comparison between aspirin and two doses of Lansoprazole

4.DISCUSSION

It was observed that the standard, test-1 and test-2 groups had paw volume inhibition of 56%,52% and 54% respectively at the third hour which is statistically significant ($p<0.01$). The percentage inhibition of volume in standard,test-1 and test-2 groups at 1,2 and 3 hours is shown in graph-1 and the table-1.The third hour paw volume of all the groups is shown in graph-2.

Lansoprazole is is a derivative of 2-[(2-pyridyl methyl)sulfinyl]-1 H –benzimidazole. It has a trifluoro ethoxy group which provides the

additional anti inflammatory property[4].In a study done by Hiroshi Ichikawa it was shown that Lansoprazole is protective in ischemia-reperfusion induced intestinal mucosal damage through inhibition of neutrophil dependent inflammation[5].It was reported that Lansoprazole inhibited the production of oxygen derived free radicals from neutrophils activated by chemotactic peptides.

Also in another study it was shown that Lansoprazole given to rats exposed to streptozotocin and cholesterol enriched diet , reduced the neutrophil infiltration and pericellular edema and prevented Alzheimer type dementia[6]. It was also discussed in a study to investigate the effect of Lansoprazole on REM sleep modulation that Lansoprazole has a potency to induce anti-inflammatory action by inhibiting the production of proinflammatory cytokines[7].

5.CONCLUSION

T.Lansoprazole has anti inflammatory property both at 5mg/kg and 10 mg/kg dose and it was comparable to that of T.Aspirin 300mg/kg . Further studies are needed for its clinical use in humans.

6.REFERENCES

(1) Golechha, M., Sarangal, V., Ojha, S., Bhatia, J., & Arya, D. S. (2014). Anti-inflammatory effect of Emblica officinalis in rodent models of acute and chronic inflammation: involvement of possible mechanisms. International journal of inflammation, 2014.
(2) Badiola, N., Alcalde, V., Pujol, A., Münter, L. M., Multhaup, G., Lleó, A., ... & Aloy, P. (2013). The proton-pump inhibitor lansoprazole enhances amyloid beta production. PloS one, 8(3), e58837.
(3) Richter, J. E., Kovacs, T. O. G., Greski Rose, P. A., Huang, S. S. B., & Fisher, R. (1999). Lansoprazole in the treatment of heartburn in patients without erosive oesophagitis. Alimentary pharmacology & therapeutics, 13(6), 795-804.
(4) Satoh, H. (2013). Discovery of lansoprazole and its unique pharmacological properties independent from anti-secretory activity. Current pharmaceutical design, 19(1), 67-75.
(5) Ichikawa, H., Yoshida, N., Takagi, T., Tomatsuri, N., Katada, K., Isozaki, Y., ... & Yoshikawa, T. (2004). Lansoprazole ameliorates intestinal mucosal damage induced by ischemia-reperfusion in rats. World Journal of Gastroenterology: WJG, 10(19), 2814.
(6) Sodhi, R. K., & Singh, N. (2013). Defensive effect of lansoprazole in dementia of AD type in mice exposed to streptozotocin and cholesterol enriched diet. PloS one, 8(7), e70487
(7) Qureshi, M. F., & Jha, S. K. (2014). Proton pump inhibition increases rapid eye movement sleep in the rat. BioMed research international, 2014.