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Research Article

To Screen and Compare the Anti-inflammatory Effect of Lansoprazole with Etoricoxib in Experimental Animal Models

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Abstract

This study was carried out to evaluate the anti-inflammatory property of Lansoprazole on rat hind paw oedema by using Plethysmometer. Male Albino rats (250gms) were divided into control, standard-1&2, test-1, test-2, test-3 and Test-4 groups, each group consists of six rats. Control group of rats were treated with 0.2ml of normal saline, standard group with Etoricoxib 10 mg/kg body weight, test-1 group with Lansoprazole 30 mg/kg body weight, test-2 group with Lansoprazole 60 mg/kg body weight, test-3 group with Lansoprazole 120 mg/kg/body weight and standard group-2 with Etoricoxib 10 mg/kg body weight test-4 group with Etoricoxib5mg/kg/bw+ Lansoprazole 60 mg/kg/bw, The anti-inflammatory property was assessed by using Plethysmometer. Lansoprozole(30,60.120mg/kg/bw) compared with normal saline are having anti-inflammatory property. Testgroup-4with Etoricoxib5mg/kg/bw+ Lansoprazole 60 mg/kg/bw is having same anti-inflammatory effect as that of Etoricoxib

Keywords: anti-inflammatory property, Lansoprazole, oedema, Plethysmometer.

Introduction

Inflammation is the local response of the living mammalian tissues to injury due to any agent. It is the defense mechanism to eliminate or limit the spread of injurious agent.[16] The word "Inflammation" is derived from the latin word Inflammacio, which means "to set a fire .

Inflammation and repair with fibrosis may be potentially harmful to the host. When inflammation is inappropriately directed against host tissues or is not adequately controlled, it becomes a cause of injury and disease. For this reason, our pharmacies abound with anti-inflammatory drugs, which ideally would control the harmful sequelae of inflammation and yet not interfere with its beneficial effects.

Interestingly, proton pump inhibitors (PPIs) which are routinely used in treatment of GERD and PUD are reported to possess anti-inflammatory properties, *in vitro*. Various *in vitro* studies have shown that lansoprazole suppresses induction of inflammatory mediators like TNF-α,[11,12] IL-1β,[11] IL-6[12] and induces protective enzyme Heme Oxygenase-1 (HO-1).[13] PPIs have also been reported to inhibit certain neutrophil functions, like Reactive OxygenSpecies (ROS) release,chemotaxis[14,15] and neutrophil-endothelial cell interactions[16] all of which contribute to the development and progression of inflammation.

Phagocytosis of particles is an early step in the elimination of harmful substances. It includes engulfment of invading organism and production of substances that destroy phagocytosed microbes and remove dead tissues; these leukocyte products include lysosomal enzymes and reactive oxygen and nitrogen species.

Screening methods

Screening methods used for evaluation of anti-inflammatory drugs were classified as

In vitro methods
In vivo methods

In vitro methods:-

1. Inhibition of inflammation induced by interferon in mouse macrophages.
2. Measurement of no production in mouse macrophages
3. Mast cell degranulation.
4. Adhesion assays.
5. Cyclooxygenase (COX) assays.

In vivo methods:

These methods again sub classified as follows

- Acute and sub acute methods
- Chronic methods.

Acute and sub acute methods:-

1. UV-B induced erythema in guinea pigs
2. Carrageenan-induced paw edema models
3. Pleural exudation method
4. Papaya latex- induced arthritis.
5. Arachidonic acid –induced ear edema in mice.

Chronic methods:-

1. Cotton pellet – induced granulomas.
2. Adjuvant arthritis.
3. Emigration leukocytes.
4. Air pouch model.

But for this experiment I used Plethysmometer for evaluation of anti-inflammatory property in rats**.**

Materials and methods

Materials

Chemicals&solutions

Carrageenan
Etoricoxib
Lansoprazole
Double distilled water
Normal saline

Animals

Albino male rats weighing about 150-250gm.

Equipment

Plethysmometer
Insulin syringes
Tuberculin syringes
Infant feeding tube
Hypodermic syringe
Measuring jar
Glass beakers
Animal weighing balance
Animal cages
Cotton
Spirit

Fig 1 Plethysmograph

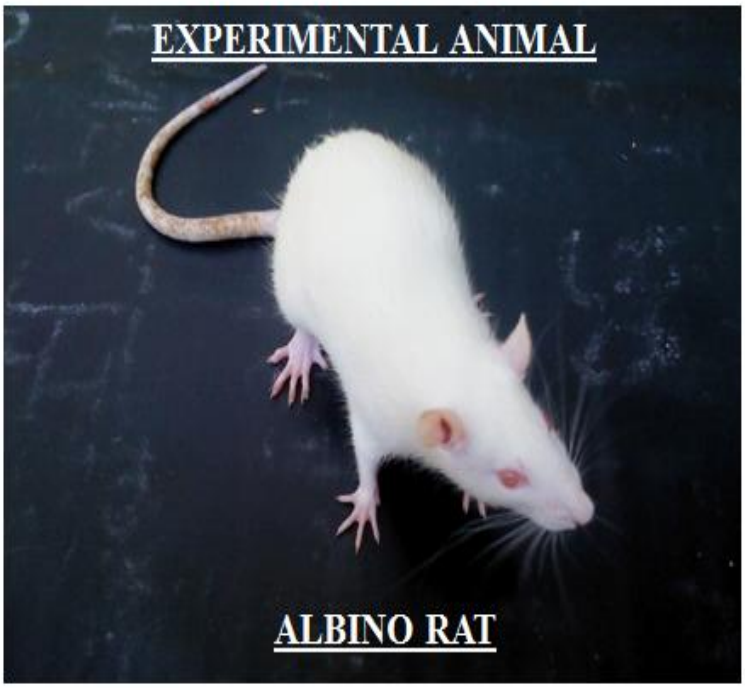


Fig 2 Albino rat

Carrageenan Induced Paw Oedema Model

To study the acute and sub acute phases of inflammation in rats. Carrageenan is a widely used irritant or inflammogen. Chemically, it is a sulphated polysaccharide obtained from sea weed (rhodophyceae). The experimental tissue injury caused by this irritant initiates a cascade of inflammatory events leading to formation of exudates. The inflammation induced by it is biphasic in nature.

The first phase is attributed to the release of histamine, 5-hydroxy tryptamine (serotonin) and kinin while the second phase is related to the release of prostaglandins.

A 1% w/v suspension of carrageenan is prepared freshly in normal saline and injected into sub planter region of left hind paw (usually 0.1ml in rats).

In control group animals only vehicle is injected. Test drug is usually administered orally, according to body weight, half an hour before the carrageenan challenge.
A mark is made at the ankle joint (tibio-sacral joint) of each rat. Paw volume up to the ankle joint is measured in drug treated and untreated groups before and 3hours after carrageenan challenge using a plethsmograph filled with mercury. Oedema is found out and % of reduction in edema is calculated using the following formula.

$$\% \text{ reduction in oedema} = \frac{\text{Mean oedema in control group - mean oedema in drug treated group}}{\text{Mean oedema in control}} \times 100$$

Method:-

Weigh the animals before experiment.
All albino male rats weighing 150-250gm are selected for the study.
Rats are divided into 7 groups. Each group contains 6 rats.
A mark is made at the ankle joint (tibio-tarsal joint) of each rat.

Initial paw volume of each rat is measured before giving drug by using plethysmometer.
To the control group rats 0.2 ml of normal saline is administered orally 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of the hind paw and the paw volume of each rat is measured after 3hours.

To the standard-1 group rats etoricoxib 10mg/kg BW is administered orally 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

To the test-1 group rats lansoprazole 30mg/kg BW is administered as single oral dose 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

To the test-2 group rats lansoprazole 60mg/kg BW is administered as single oral dose 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

To the test-3 group rats lansoprazole 120mg/kg BW is administered as single oral dose 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

To the standard-2 group rats etoricoxib 5mg/kg BW is administered orally 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

To the (std-2+test-2) group rats etoricoxib 10mg/kg BW and lansoprazole 60mg/kg/BW are administered orally 1hour before injecting 0.1ml of 1% carrageenan to the sub-plantar region of hind paw and the paw volume of each rat is measured after 3hours.

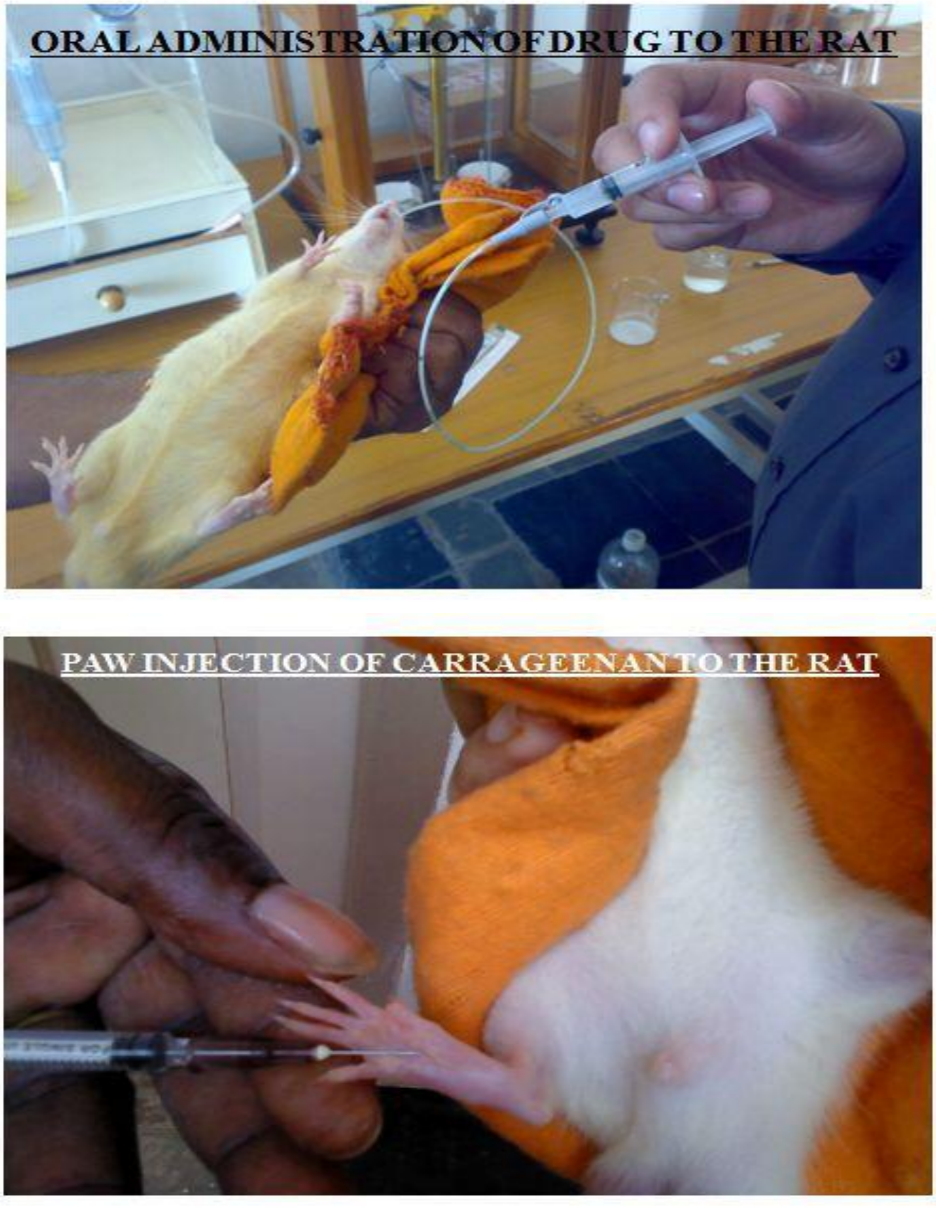


Fig 3 Injection of carrageen in to rat paw

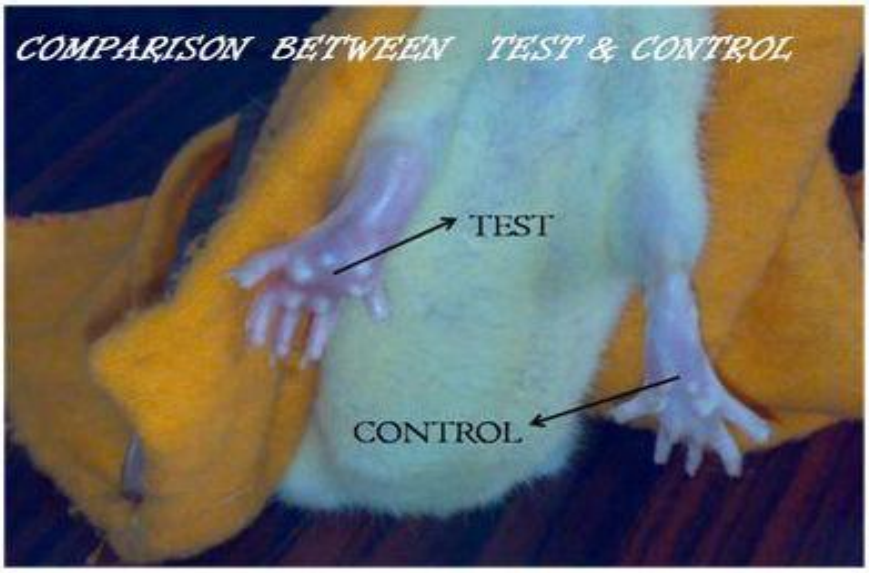


Fig 4 Comparison of inflammation

Observations and results

Control

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Normal saline
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-plantar region of left hind paw
6. Mean rat paw oedema volume = 2.0mmhg

Table: 1 control 0.2 ml of normal saline

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs (mm)				
1	1	3	2mm	2.00	0.02581	0%
2	1	3.1	2.1mm			
3	1	3	2mm			
4	1	2.9	1.9mm			
5	1	3	2mm			
6	1	3	2mm			

Standard

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Etoricoxib 10mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-plantar region of left hind paw
7. Mean rat paw oedema volume = 0.56mmhg

Table: 2 etoricoxib 10mg/kg bw (s)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	2	2.6	0.6 mm	0.56	0.2108	71.66%
2	2	2.5	0.5 mm			
3	2	2.6	0.6 mm			
4	2	2.5	0.5 mm			
5	2	2.6	0.6 mm			
6	2	2.6	0.6mm			

Test 1

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Lansoprazole30mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-planter region of left hind paw
6. Mean rat paw oedema volume = 1.66mmhg

Table: 3 lansoprazole30mg/kg bw(t1)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	1	2.7	1.7 mm	1.66	0.02108	16.66%
2	1	2.7	1.7 mm			
3	1	2.6	1.6 mm			
4	1	2.7	1.7 mm			
5	1	2.7	1.7 mm			
6	1	2.6	1.6mm			

Test 2

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Lansoprazole 60mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-planter region of left hind paw
6. Mean rat paw oedema volume = 1.33mmhg

Table: 4 lansoprazole 60mg/kg bw (t2)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	1	2.4	1.4 mm	1.33	0.02108	33.33%
2	1	2.2	1.3 mm			
3	1	2.4	1.4 mm			
4	1	2.3	1.3 mm			
5	1	2.2	1.3 mm			
6	1	2.3	1.3mm			

Test 3

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Lansoprazole 120mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-planter region of left hind paw
6. Mean rat paw oedema volume = 0.85mmhg

Table: 5 lansoprazole120mg/kg BW (T3)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	1	1.9	0.9 mm	0.85	0.02236	57.5%
2	1	1.8	0.8 mm			
3	1	1.9	0.9 mm			
4	1	1.8	0.8 mm			
5	1	1.8	0.8 mm			
6	1	1.8	0.8mm			

Standard-2

1. Number of animals present in this group = 6 rats
2. Drug administered in this group = Etoricoxib5mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-planter region of left hind paw
6. Mean rat paw oedema volume = 1.23mmhg

Table: 6 Etoricoxib 5mg/kg BW(Std-2)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	1	2.1	1.2 mm	1.23	0.021082	38.33%
2	1	2.3	1.3 mm			
3	1	2.2	1.2mm			
4	1	2.2	1.2 mm			
5	1	2.2	1.2 mm			
6	1	2.2	1.2mm			

Standard-2 + Test-2

1. Number of animals present in this group = 6 rats
2. Drug s administered in this group = Etoricoxib 5mg/kg/bw and alsoLansoprazole60mg/kg BW
3. Oral Dosage = 0.2ml
4. Time interval after Drug administration = 1hour
5. Inject 0.1ml of 1% carrageenan sodium salt under sub-planter region of left hind paw
6. Mean rat paw oedema volume = 0.73mmhg

Table: 7 Etoricoxib 5mg/kg BW +Lansoprazole60mg/kg/bw(std-2+test-2)

S.no	Rat paw oedema volume after carrageenan injection		Actual paw volume	Mean	SE	% of oedema inhibition
	At 0hrs(mm)	After 3hrs(mm)				
1	2	2.5	0.8mm	0.73	0.02108	63.33%
2	2	2.7	0.7mm			
3	2	2.8	0.7mm			
4	1	1.8	0.8 mm			
5	1	1.7	0.7 mm			
6	1	1.7	0.7mm			

Table-8 Comparison of mean actual paw volume between control with standard and test drugs

S.no	Actual paw volume						
	Normal saline Control	**Etoricoxib-Std-1**	**Lansoprazole** Test-1	**Lansoprazole** Test-2	**Lansoprazole** Test-3	**Etoricoxib-Std-2**	**Std-2+test-2**
1	2.0	0.6	1.7	1.4	0.9	1.2	0.8
2	2.1	0.5	1.7	1.3	0.8	1.3	0.7
3	2.0	0.6	1.6	1.2	0.9	1.2	0.7
4	1.9	0.5	1.7	1.3	0.8	1.2	0.8
5	2.0	0.6	1.7	1.3	0.8	1.2	0.7
6	2.0	0.6	1.6	1.3	0.8	1.2	0.7
Mean	2.0	0.56	1.66	1.33	0.85	1.23	0.73
S.D	0.0632	0.05164	0.05164	0.05164	0.05477	0.05164	0.05164
S.E	0.0258	0.02108	0.02108	0.02108	0.02236	0.02108	0.02108
% of inhibition	0%	71.66%	16.66%	33.33%	57.5%	38.33%	63.33%

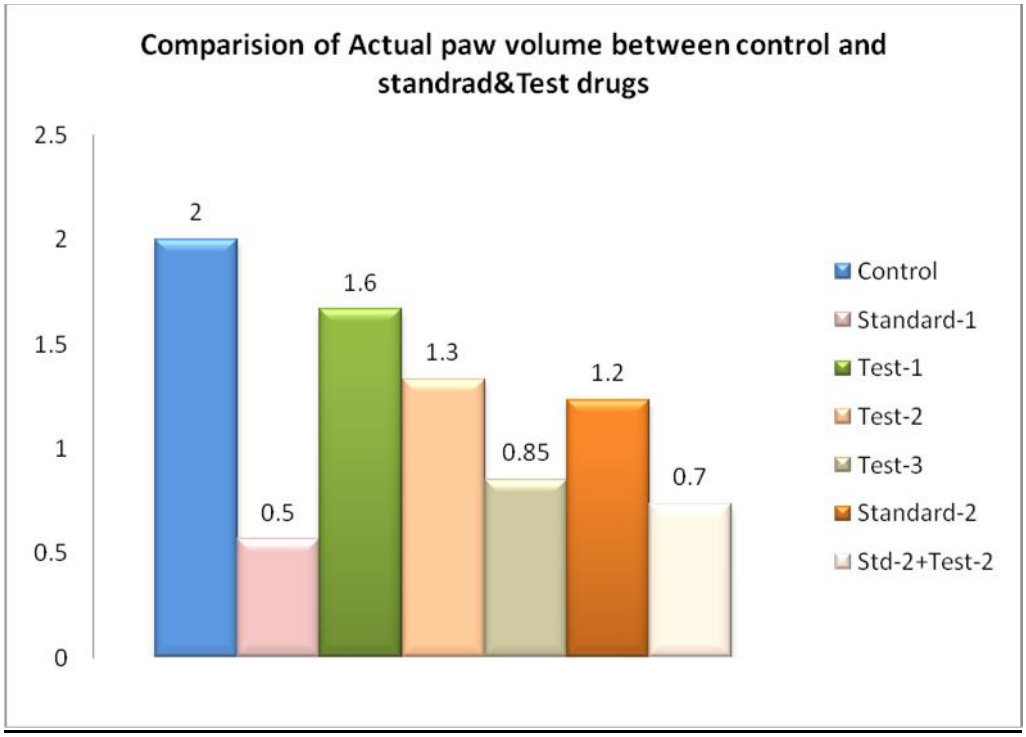
Table-9

Comparision	Mean difference	95% Confidence interval		p-Value
		From	To	
Control v_sStandard-1	*1.44*	1.359	1.508	<0.0001
Control v_sTest-1	0.32	0.259	0.408	<0.0001
Control v_sTest-2	0.66	0.592	0.741	<0.0001
Control v_sTest-3	1.16	1.074	1.226	<0.0001
Control v_sStandard-2	0.8	0.692	0.841	<0.0001
Control v_s-(Standard-2+Test-2)	1.26	1.192	1.342	<0.0001
Standard-1 v_sTest-1	-1.12	-1.166	-1.034	<0.0001
Standard-1v_sTest-2	-0.78	-0.833	-0.700	<0.0001
Standard-1 v_sTest-3	-0.28	-0.352	-0.215	<0.0001
Standard-1v_sStd-2	-0.64	-0.733	-0.600	<0.0001
Standard-1$v_{s(}$Std-2+Test-2)	-0.18	-0.233	-0.100	<0.0002
Test-1vsTest-2	0.33	0.267	0.400	<0.0001
Test-1vsTest-3	0.81	0.767	0.900	<0.0001
Test-2vsTest-3	0.48	0.434	0.566	<0.0001

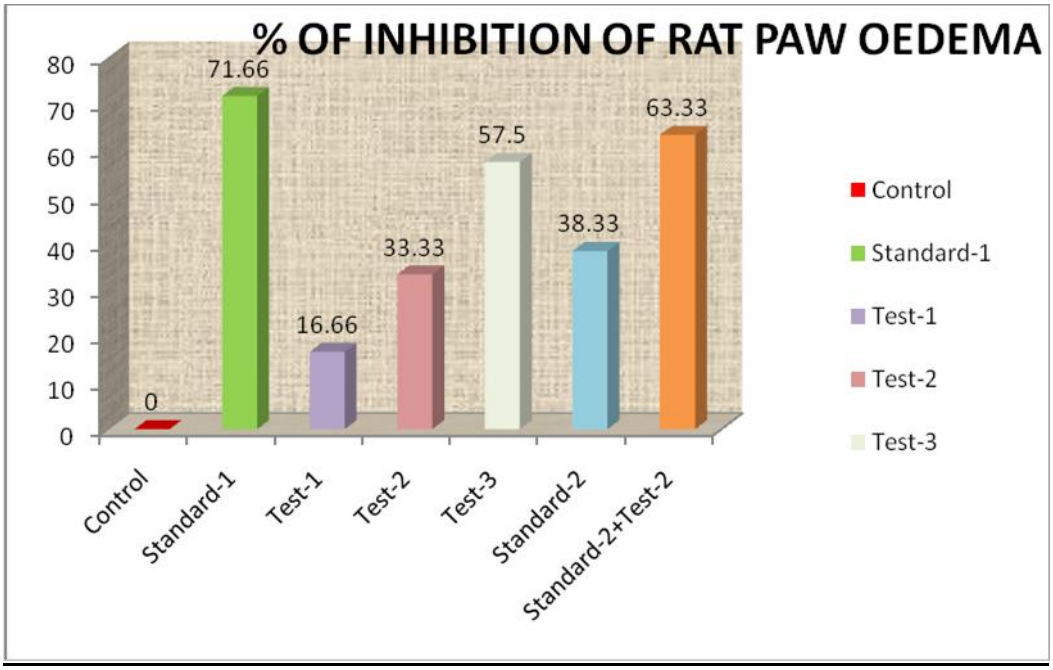
ANOVA

Sources of variation	Degree of freedom	Sum of squares	Mean square	F
Treatment (Between columns)	6	9.708095	1.618016	557.0219 HS
Residuals(within the columns)	35	0.101667	0.002905	
Total	41	9.809762		

BARDIAGRAM-1



BARDIAGRAM-2



Results

For this evaluation study of anti-inflammatory effect of lansoprazole in albino rats by using Plethysmometer 42 albino rats were selected and are divided into 7 groups each containing 6 albino rats (i.e., group I, II, III ,IV,V,VI and VII respectively). The weight and actual paw volume of each albino rat is recorded by injecting at sub plantar region to 0.2% carragenan before injecting the drug.

In the I group (control) of albino rat before administration of drug the mean of Actual paw volume is 1.0mm and after administration of 1 ml of normal saline showed mean actual paw volume of 2.0+0.025 mm with SD of 0.06324 and SE of 0.02581 at 3rd hour (Table: 1 and bardiagram I).

In the II group (standard-1) albino rat of before administration of drug the mean of Actual paw volume is 2.0mm and after administration of 10 mg/kg BW Etoricoxib showed mean actual paw volume 0.56+0.021 mm SD of 0.05164 and SE of 0.02108 at 3rd hour (Table: 2and bar diagram I)

In the III group (test – 1) of albino rats before administration of drug the mean actual paw volume is 1.0mm and after administration of 30 mg/kg BW lansoprazole showed mean actual paw volume of 1.66+0.021 with SD of 0.05164 and SE of 0.02108at 3rd hour (Table: 3 and bar diagram I).

In the IV group (test – 2) of albino rats before administration of drug the mean of Actual paw volume is 1.0 mm and after administration of 60 mg/kg BW lansoprazole showed mean actual paw volume of 1.33+0.021mm with SD of 0.05164 and SE of 0.02108 at 3rd hour(Table: 4 and bar diagram I).

In the V group (test – 3) of albino rats before administration of drug the mean of Actual paw volume is 1.0mm and after administration of 120 mg/kg BW lansoprazole showed mean actual paw volume of 0.85+0.022 mm with SD of 0.054772 and SE of 0.022361 at 3rd hour(Table: 5 and bar diagram I).

In the VI group (std – 2) of albino rats before administration of drug the mean of Actual paw volume is 1.0mm and after administration of 5 mg/kg BW Etoricoxib showed mean actual paw volume of1.23+0.021mm with SD of 0.05164 and SE of 0.021082 at 3rd hour(Table: 6 and bar diagram I).

In the VII group (std -2+test-2) of albino rats before administration of drugs the mean of Actual paw volume is 1.5mm and after administration of 5 mg/kg BW Etoricoxib and 60 mg/Kg BW lansoprazole mean actual paw volume of 0.73+0.021mm with SD of 0.05164 and SE of 0.02108 at 3rd hour(Table: 7 and bar diagram I).

In comparison of control group with standard group-1 the mean difference of Actual paw volume at 3rd hour is 1.44 with 95% confidence interval from -1.359 to 1.508 with a p value of <0.001 (Table: 9).

In comparison of control group with test - 1 group the mean difference of Actual paw volume at 3rd hour is 0.32 with 95% confidence interval from -0.259 to 0.408 with a p value of <0.001 (Table: 9).

In comparison of control group with test - 2 group the mean difference of Actual paw volume at 3rd hour is 0.66 with 95% confidence interval from -0.592 to 0.741 with a p value of <0.001 (Table: 9).

In comparison of control group with test - 3 group the mean difference of Actual paw volume at 3rd hour is 1.16 with 95% confidence interval from -1.074 to 1.226 with a p value of <0.001 (Table: 9).

In comparison of control group with std - 2 group the mean difference of Actual paw volume at 3rd hour is 0.8 with 95% confidence interval from -0.692 to 0.841 with a p value of <0.001 (Table: 9).

In comparison of control group with (std-2+test – 2) group the mean difference of Actual paw volume at 3rd hour is 1.26 with 95% confidence interval from -1.192 to 1.342 with a p value of <0.001 (Table: 9).

In comparison of standard group-1 with test - 1 group the mean difference of Actual paw volume at 3rd hour is -1.12 with 95% confidence interval from -1.166 to-1.034 with a p value of <0.001 (Table: 9).

In comparison of standard group-1 with test - 2 group the mean difference of Actual paw volume at 3rd hour is -0.78 with 95% confidence interval from --0.833 to –0.700 with a p value of <0.001 (Table: 9).

In comparison of standard group-1 with test - 3 group the mean difference of Actual paw volume at 3rd hour is -0.28 with 95% confidence interval from --0.352 to -0.215 with a p value of <0.001 (Table: 9).

In comparison of standard group-1 with std - 2 group the mean difference of Actual paw volume at 3rd hour is -0.64 with 95% confidence interval from -0.733 to -0.600 with a p value of <0.001 (Table: 9).

In comparison of standard group-1 with (std-2+ test – 2) group the mean difference of Actual paw volume at 3rd hour is -0.18 with 95% confidence interval from -0.233 to –0.100 with a p value of <0.001 (Table: 9).

In comparison of test group-1 with test - 2 group the mean difference of Actual paw volume at 3rd hour is 0.33 with 95% confidence interval from -0.267 to 0.400 with a p value of <0.001 (Table: 9).

In comparison of test group-1 with test - 3 group the mean difference of Actual paw volume at 3rd hour is 0.81 with 95% confidence interval from -0.767 to 0.900 with a p value of <0.001 (Table: 9).

In comparison of test group-2 with test - 3 group the mean difference of Actual paw volume at 3rd hour is 0.48 with 95% confidence interval from -0.434 to 0.566 with a p value of <0.001 (Table: 9).

Comparison between mean actual paw volume of control, standard-1, test – 1 and test - 2,test-3.&standard-2+Test-2 groups showed statistically significant p value of < 0.001 at 3rd hour.

Percentage of inhibition offered by Etoricoxib 10 mg/kg BW (standard drug-1) at 3rd hour is 71.66% and Lansoprazole 30 mg/kg BW (test drug-1) showed 16.66% at 3rd hour and Lansoprazole 60 mg/kg BW (test drug-2) showed 33.33% at 3rd hour& Lansoprazole 120 mg/kg BW (test drug-3) showed 57.5% at 3rd hour and Etoricoxib 5 mg/kg BW showed 38.33% at 3rd hour Etoricoxib 5 mg/kg BW& Lansoprazole 60mg/kg BW(standard-2+Test-2) showed 63.33% at 3rd hour. This indicates that Etoricoxib showed abetter percentage of protection when compared to Lansoprazole (Table:8&Bardiagram-2).

Discussion

The present study was carried out to evaluate the anti-inflammatory property of lansoprozole. For this Etoricoxib was selected as standard drug where as lansoprozole(30,60, 120mg/kg BW), were selected as test drugs.

Etoricoxib is selective COX-2 (Cyclooxygenase) inhibitor, where as lansoprazole anti-inflammatory drug by suppresses induction of inflammatory mediators like TNF-α,[11,12] IL-1β,[11] IL-6[12] and induces protective enzyme Heme Oxygenase-1 (HO-1).[13] and by decreasing proinflammatory cytokines release from the phagocytes.

Total rats were divided into 7 groups. Group-1 rats were considered as controls and treated with normal saline, group-2 rats as standard and treated with etoricoxib of 10mg/kg BW, group-3 rats as test-1 and treated with Lansoprazole 30mg/kg BW, group-4 rats as test-2 and treated with Lansoprazole 60mg/kg BW,, group-5 rats as test-3 and treated with Lansoprazole 120mg/kg BW, group-6 rats as Standard-2 and treated with Etioricoxib10mg/kg BW, group-7 rats as (Standard-2+test-2) and treated with Etoricoxib 5mg/kgBW and Lansoprazole 60mg/kg BW.

The readings were recorded using Plethysmometer and the results were analyzed using Anova test.

Results shown

1. In control group with 0.2 ml of normal saline there was no decrease in rat paw oedema (Table-1).
2. The standard group-1 with etoricoxib 10 mg/kg body weight showed inhibition of rat paw oedema was 71.6% with SE of 0.210 (Table-2).
3. The test-1 group with Lansoprazole 30 mg/kg body weight showed inhibition of rat paw oedema was1 6.66% with SE of 0.0210 (Table-3).
4. The test-2 group with Lansoprazole 60 mg/kg body weight showed inhibition of rat paw oedema was 33.33 % with SE of 0.0210 (Table-4).
5. The test-3 group with Lansoprazole 120 mg/kg body weight showed inhibition of rat paw oedema was 57.5 % with SE of 0.0223 (Table-5).
6. The test-4 group with Etoricoxib 5 mg/kg body weight showed inhibition of rat paw oedema was 38.33 % with SE of 0.0210 (Table-6).
7. The test-5 group with Etoricoxib 5mg/kg body weight and Lansoprazole 60 mg/kg body weight showed inhibition of rat paw oedema was 63.33 % with SE of 0.0210 (Table-7).

In comparision between these six groups , we were found that all groups (both standard and test groups) showed inhibition of % of rat hind paw oedema. Better results are shown by Etoricoxib compared to test drugs. Test group-5(Etoricoxib-5mg/kg +Lansoprazole 60mg/kg/BW)also showed similar % of inhibition as that of etoricoxib but Lansoprazole(30,60,120mg) showed less % of inhibition of rat hind paw oedema.

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