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Original Research Article

Screening of Anti-inflammatory Effect of Venlafaxine in Wistar Albino Rats

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Abstract: The aim is to **e**valuation of anti-inflammatory effect of Venlafaxine in Wistar Albino Rats. Wistar Albino rats were used in the study. Total 18 rats were divided into three groups each of 6 rats. G-A (Control), G-B- Aspirin (300 mg/kg) and G-C (Venlafaxine (50 mg/kg). All the drugs given 30 min before induction of paw inflammation by Carrageenan. Data was expressed by MEAN±SD and percentage (%). SPSS software was used for statistical analysis of data. Rats treated with standard and test drug showed significant difference compared to control group. Aspirin showed significant anti-inflammatory effect compared to Venlafaxine group. Similar results were observed in percentage of inflammation and reduction in percentage of inflammation. Venlafaxine produced anti-inflammatory action in paw model in rats. The anti-inflammatory effect of test drug is similar to Aspirin.
Keywords: Anti-inflammatory, Aspirin, Carrageenan, Paw edema, Percentage of inhibition, Venlafaxine

INTRODUCTION

Venlafaxine is a known anti-depressant drug. It produces anti-depressant effect by inhibiting reuptake of serotonin and norepinephrine. Recently the anti-inflammatory effect of Venlafaxine was studied in the various models [1, 2]. Inflammatory diseases are the major health problems in the society. Inflammation is a complex pathway and various mediators are involved. The inflammation starts from damage to the cells, synthesis of inflammatory mediators, aggregation of immune cells and edema [3]. NSAIDs are the most commonly used to suppress the inflammation. Treatment with NSAIDs is associated with various adverse effects [4]. Anti-depressants showed anti-inflammatory effect in various models. With this background the present study conducted to evaluate the anti-inflammatory effect of Venlafaxine in rats.

MATERIALS AND METHODS

Animals

Wistar strain of Albino rats of either sex weighing between 250-300 gm were divided into three groups of 3 animals each [5]. They were starved overnight with free access to water. The study was ethically cleared from Institutional Animal Ethics Committee (IAEC).

Study design

Group-A: Distilled water (Control)
Group-B: Aspirin (300 mg/kg) (Standard)
Group-C: Venlafaxine (50 mg/kg) (Test) [6]

Procedure

The method employed for the study of anti inflammatory effect is Carrageenan induced Rat-Paw edema method. One hour after administration of drugs, a sub-plantar injection of 0.1 ml of 1% Carrageenan was given to the left hind paw of each rat. A convenient anatomical land mark was noted at the ankle joint to determine the dipping of the rat paw to the same level in the plethysmograph every time. The left hind paw volume was measured by using the plethysmograph immediately (zero hour volume) and at the end of fourth hour [7]. The difference between these two readings indicates the actual edema volume. Thus the mean paw edema volume in animals treated with standard drug and test drug were compared with untreated control

group and the anti-inflammatory activity of the drugs was calculated by using the formu
la

"Percentage inhibition in edema (%) = Vc – Vt/Vc x 100"

Where:
Vc: Mean volume of paw edema in control group
Vt: Mean volume of paw-edema in the drug treated group (ie) standard group and test group. [8]

STATISTICAL ANALYSIS

The data was expressed in Mean ±SD and percentage (%). SPSS (Statistical Package for Social Sciences 16.0 version). ANOVA (Post hoc) followed by Dunnet t test applied to find statistical significant between the groups. p value less than 0.05 ($p<0.05$) considered statistically significant at 95% confidence interval [9].

RESULTS

The effects of control, Aspirin and the Venlafaxine on inflammation induced by 1% Carrageenan in the hind paw of albino rats were evaluated and compared. The mean paw volume of albino rats in the control group was found to be 4.33+0.61 ml. There is no significant inhibition of inflammation in the control group. The mean paw volume of albino rats in the standard group was found to be 1.66 +0.63ml and with venlafaxine it was 2.33+0.63ml. The mean percentage of inhibition of inflammation for standard group (aspirin) was 62%. The mean percentage of inhibition of inflammation for test group (venlafaxine) was 47%.

Table-1: Screening of anti-inflammatory activity Venlafaxine in paw edema method

Group	Drug	Paw volume (ml) (MEAN+SD)
Group-A	Distilled Water	4.33+0.61
Group-B	Aspirin	1.66+0.63*
Group-C	Venlafaxine	2.33+0.63*,#

(*p<0.05 significant compared group-A with other groups,
#p<0.05 significant compared Group-B with other groups)

Table-2: Evaluation of mean percentage of inflammation of venlafaine

Group	Drug	Mean % of Inflammation
Group-A	Distilled Water	100
Group-B	Aspirin	38.00*
Group-C	Venlafaxine	53.00*,#

(*p<0.05 significant compared group-A with other groups,
#p<0.05 significant compared Group-B with other groups)

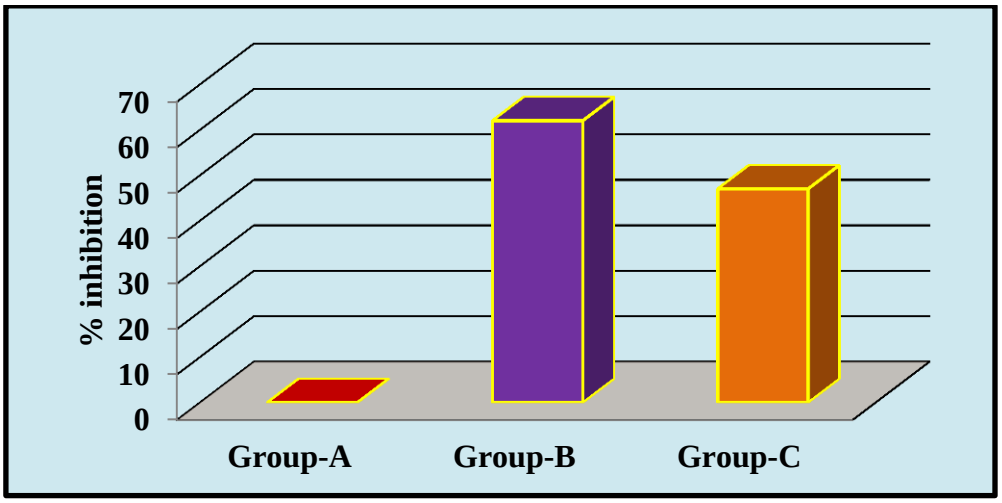

Fig 1: Evaluation of mean percentage of inhibition of inflammation of venlafaxine

DISCUSSION

Venlafaxine showed anti-inflammatory effect in this study. Inflammation is an important indicator of tissue damage. It is well known that inflammation is caused by various mediators like prostaglandins, leuckotrines, histamine and platelet activating factor [10, 11]. These are involved in the development of edema and inflammation. Carrageenan is an agent commonly used to induce inflammation in animal models [12]. Aspirin is a NSAIDs used to reduce the inflammation. It produces anti-inflammatory action by inhibiting prostaglandin synthesis. In the present study also aspirin showed anti-inflammatory action. Venlafaxine given rats showed similar anti-inflammatory action. It may also act by same mechanism or different mechanism to reduce the inflammation.

CONCLUSION

Venlafaxine showed significant anti-inflammatory action in paw model in rats. Further studies required to find the mechanism of action of anti-inflammatory effect of venlafaxine in various models.

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