

## An Open Labelled, Randomized Controlled Trial to Evaluate Acute Antidepressant Activity of Ciprofloxacin and Levofloxacin by Using Tail Suspension Test in Swiss Albino Mice

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### Abstract

**Aim:** Acute antidepressant activity of ciprofloxacin and levofloxacin by using tail suspension test in swiss albino mice. **Methods:** The study was an open labeled, randomized controlled trial conducted in the Department of Pharmacology, J.L.N.M.C.H. Bhagalpur, bihar, India for 15 months, after taking the approval of the protocol review committee and institutional ethics committee. Swiss albino mice weighing 20-25 gm were divided randomly in to six groups. Group I: 1% Gum acacia, 10ml/kg (Control), Group II: Imipramine (Standard), 10mg/kg, Group III and IV, Ciprofloxacin 25 & 50 mg/kg respectively, Group V & VI, Levofloxacin, 25 & 50 mg served as test groups respectively. **Results:** Immobility duration based on mean $\pm$  SD was 86.67  $\pm$  2.61 sec for control, 52.50  $\pm$  5.95 sec for Imipramine, 63.50  $\pm$  19.00 sec and 67.17  $\pm$  10.21 sec for Ciprofloxacin 25mg/kg and 50mg/kg respectively. Similarly, immobility duration for Levofloxacin was 68.67  $\pm$  14.41 sec and 69.00  $\pm$  18.85 sec respectively. **Conclusion:** This study did not show any antidepressant activity of both the drugs by tail suspension test in Swiss albino mice which is a contrary result compared to our previous study of forced swim test with significant antidepressant effect.

**Keywords:** antidepressant activity, mice, ciprofloxacin and levofloxacin

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### Introduction

Depression is a mental disorder serious nature which affects our modern society. According to World Health Organization (WHO), estimates that depression will become second most common cause for losing the work time in the world.[1] Recent estimates suggest that the risk factor of depression is suicidal thoughts and

attempts and more surprisingly it is seen even in patients receiving standard treatment. Approximately 1/5<sup>th</sup> of the total population will suffer one episode at least with clinical depression with a loss of social and also economic burden more commonly on the society in which they live.[2] Based on serendipity, some clinical studies in

human beings and biochemical investigations, the progress of the disease has been little understood so far and clinicians have classified four major classes of drugs having antidepressant activity.[3-5] As a matter of fact, not all patients suffering from depression will respond equally to the treatment and moreover the time lag between the time of drug administration and the onset of drug action is still a problem.[6-10] Despite of many drugs available in the market, their still search for newer drugs as the earlier drugs are known for its drawbacks like delayed onset of action and carries unacceptable adverse effects. We have already reported the same drugs (Ciprofloxacin and Levofloxacin) showing antidepressant activity by forced swim test in Swiss albino mice at the dose of 25 mg/kg and 50 mg/kg respectively in both acute and chronic (10-days) administration.

### Material and methods

The study was an open labeled, randomized controlled trial conducted in the Department of Pharmacology, J.L.N.M.C.H. Bhagalpur, Bihar, India for 15 months. after taking the approval of the protocol review committee and institutional ethics committee. Swiss albino mice

weighing 20-25 gm were divided randomly into six groups. Group I: 1% Gum acacia, 10ml/kg (Control), Group II: Imipramine (Standard), 10mg/kg, Group III and IV, Ciprofloxacin 25 & 50 mg/kg respectively, Group V & VI, Levofloxacin, 25 & 50 mg served as test groups respectively.

### Procedure

Each mouse was suspended by using a metal rod placed 50cm above the surface and its tail was pasted on to rod by an adhesive tape approximately 1cm away from the tip. Its mobility and immobility time was recorded discarding the initial 2 minutes and considering the last 4 minutes of observation. Decrease in immobility time was considered to be having antidepressant effects. When animal did not show any movement of body and hanged passively, it was considered as immobile time. A decrease in the immobility period is suggestive of antidepressant activity.

### Statistics

The statistical method used in this study was ANOVA followed and post hoc by Dunnett's multiple comparison test. The observations were mean  $\pm$  SD.  $p <$  was considered as statistical significance.

**Table 1: Effect of acute treatment of Ciprofloxacin and Levofloxacin by using Tail suspension test**

Groups	Treatment (dose in mg/kg)	Duration immobility in seconds (Mean $\pm$ SD)	p value
1	Control	86.67 $\pm$ 2.61	
2	Standard (Imipramine)	52.50 $\pm$ 5.95*	P<0.006
3	Ciprofloxacin 25mg/kg)	63.50 $\pm$ 19.00*	P>0.086
4	Ciprofloxacin 50mg/kg)	67.17 $\pm$ 10.21*	P>0.202
5	Levofloxacin 25mg/kg)	68.67 $\pm$ 14.41*	P>0.243
6	Levofloxacin 50mg/kg)	69.00 $\pm$ 18.85*	P>0.258
<b>Observations: Mean<math>\pm</math>SD, ANOVA, post hoc:Dunnet's, *p&gt;0.05-Not Significant</b>			

## Results

Immobility duration based on mean  $\pm$  SD was  $86.67 \pm 2.61$  sec for control,  $52.50 \pm 5.95$  sec for Imipramine,  $63.50 \pm 19.00$  sec and  $67.17 \pm 10.21$  sec for Ciprofloxacin 25mg/kg and 50mg/kg respectively. Similarly, immobility duration for Levofloxacin was  $68.67 \pm 14.41$  sec and  $69.00 \pm 18.85$  sec respectively.

## Discussion

In our study, it indicates no antidepressant activity of Ciprofloxacin and Levofloxacin in the dose of 25mg/kg and 50mg/kg respectively compared to control. None of the dose of both the drugs has shown antidepressant effect with a p value of  $>0.05$  by tail suspension test in Swiss albino mice. Our previous study with forced swim test on acute and chronic administration has shown antidepressant activity, but has failed in this study. Might be the model variation be the fact, but nevertheless, we will plan for a repeat study and also try to conduct the chronic study with the same to ascertain the antidepressant activity by tail suspension test in Swiss albino mice.

## Conclusion

Our study did not show any antidepressant activity of both the drugs by tail suspension test in Swiss albino mice which is a contrary result compared to our previous study of forced swim test with significant antidepressant effect. Hence, we wish to repeat this study for conforming the same in future research

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