



EFFECTS OF FLUOXETINE ON BEHAVIOUR OF WISTAR RAT

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ABSTRACT Fluoxetine is an antidepressant used worldwide for the treatment of depression. The current study aimed to investigate the indirect effects of fluoxetine on rat using tail suspension test as the method of assessment. The experimental rats were fed with fluoxetine treated *Catla catla* fish and subjected to the tail suspension test. The time taken by the animal to jump and hold its tail when suspended in air was recorded. A significant difference was observed between the tail suspension test timings for control and experimental groups indicating the effects of fluoxetine.

KEYWORDS : Fluoxetine, immobility, *Catla catla*

INTRODUCTION

In today's times, depression is considered one of the major causes of disability among the people. According to the world health organization "Depression is a common mental disorder that presents itself with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration". Seligman (1975) referred to depression as the common cold due to its recurrence. Depression is mostly coupled with feelings of anxiety and at times can lead to suicide of an individual. It is considered to affect almost 350 million people worldwide. World Mental health Survey found that almost 1 in 20 people are suffering from depression and it often begins at a young age. The treatment of depression involves counselling with antidepressant medications. Fluoxetine is an antidepressant used worldwide for the treatment of depression.

Fluoxetine is a selective serotonin reuptake inhibitor. It is used to treat depression and anxiety disorders. Peak plasma concentrations are considered to occur immediately within 6-8 hours. Fluoxetine is sold only by prescription and under various names like Prozac, Sarafem, etc. the side effects of this drug are comparably bearable and minimum. (Drugbank).

With the increasing incidence of depression, the usage of fluoxetine is also on the rise. This drug enters the waterways through the sewage system and comes in contact with the aquatic life present there. This may then be absorbed by the aquatic animals present and may cause harm to the hormonal systems of the aquatic life including fish.

Fish is a staple food along the coastal regions of India and is eaten by most of the population. Fish contaminated with such drugs has the capacity to harm humans upon consumption.

The main aim of the current study was to investigate the indirect effects of fluoxetine on rats through the medium of fluoxetine contaminated freshwater fish *Catla catla* using the tail suspension test. *Catla catla* is a freshwater fish of India. It is abundantly available and cheap in cost. The tail suspension test is used to screen the effects of antidepressants in rodents (L. Steru et al., 1985).

MATERIALS AND METHODS

Test organism:

Wistar Albino rat male and female rats weighing approximately 150 to 200 g.

Test chemicals:

Fluoxetine

Test feed

Fluoxetine-treated freshwater fish *Catla catla*

Experimental design:

20 live and healthy Wistar rats were procured from Bharat Serums and Vaccines Ltd. The rats were housed in a well-equipped animal house

15 days for acclimatization and fed commercially available feed (10 % body weight). Post acclimatization the animals were fed with the contaminated fish and subjected to the tail suspension test pre-eating and 30 minutes post eating.

Tail suspension Test:

The rats were divided into two groups of Control and Experimental consisting of 10 rats each. The animals were suspended by their tail in mid-air and the time taken by each animal to jump up or flex its spine and hold its tail was recorded in seconds before eating and 30 minutes after eating the fluoxetine contaminated *C. catla* fish.

The obtained results were statistically analyzed using ANOVA.

RESULTS AND OBSERVATIONS

The control and experimental fish were subjected to the tail suspension test.

Table 1: tail suspension test for rat fed with fluoxetine-treated *Catla catla*

	Mean \pm SD	95 % CI
TIME IN SECONDS 10 MINS PRIOR TO FEEDING	1.99 \pm 0.81	(0.7011, 3.2789)
TIME IN SECONDS 30 MINS POST FEEDING	8.89 \pm 0.31	(8.3967, 9.3833)

From the above table, it can be seen that the rats fed with fluoxetine treated fish took a mean of 8.89 seconds to jump up and flex its spine and hold its tail. This time of immobility or struggle is more than the mean time taken by the control group of 1.99 seconds.

The variance was calculated at a set significance of 0.05. P-value obtained through ANOVA analysis for the control and experimental group was less than 0.01 hereby indicating a significant difference between the two groups.

Figure 1. The rat is suspended in air.



Figure 2. The rat is trying to hold its tail**DISCUSSION**

The tail suspension test is a reliable indicator to assess the activity and effect of the antidepressant in animals. In the current work, rats were fed with fluoxetine treated *Catla catla* fish and subjected to the tail suspension test. The immobility of the animal was monitored by recording the time taken by the rats to jump and hold its spine on being suspended in mid-air by the tail.

The tail suspension test carried out by Vinod Shinde et al., (2015) on flunarizine and fluoxetine yielded similar results when compared to the present work. He also observed a significant increase in time duration post-treatment with the drugs in the animal. Similar results were obtained by Vincent Castagne (2010) for various drugs possessing antidepressant activity.

Although the tail suspension test is a common test conducted for antidepressant drugs, most of the research carried out injects the drug directly into the animal. But in the present work the drug to be assessed is fed to the rat indirectly through the treated fish.

CONCLUSION

From the above, it can be concluded that fluoxetine has an indirect effect on the rat. Although the drug was administered via feed the drug showed a prominent effect on the immobility of the animal. This indicates that on consumption of such treated fish, the drugs accumulated in the fish body have the ability to harm the humans and animals consuming the fish.

Acknowledgement

Authors would like to thank Dr. A. S. Khemnar, Director, The Institute of Science, Mumbai and the Head of the Zoology Department, The Institute of Science, Mumbai

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