Available online at www.derpharmachemica.com

ISSN 0975-413X
CODEN (USA): PCHHAX

Der Pharma Chemica, 2016, 8(16):112-115
(http://derpharmachemica.com/archive.html)

The comparative effect of hydro alcoholic extract of passion flower and fluoxetine on depression symptoms in mice by forced swimming test

Zahra Dalvand[1], Mehrdad Modaresi[2*] and Ilnaz Sajjadian[1]

[1]*Department of Psychology, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*
[2]*Department of Animal Science, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*

ABSTRACT

This study was carried out to investigate the effect of passion flower extract and fluoxetine on depression symptoms in mice by using forced swimming test. In this experimental study, forty mature mice from Balb/C race were randomly divided into five groups: Control, fluoxetine and 50, 100 and 200 mg/kg doses of extract. The extract was injected intraperitoneally. Depression was enforced using tetrabenazine 65 minutes before injection. Three groups has been received 50, 100 and 200 mg/ kg hydro alcoholic extract of passion flower via intraperitoneal injection. Group four has been received 1.4 mg/ kg fluoxetine, while group five as a control ones received no treatment.The forced swimming test was used to assess depression mood, and increase in the movement time to second and decrease of time to move less assigned as an index for depression. The SPSS software was used for analyzing collected data. Compare to control group and fluoxetine, hydro alcoholic extract of passion flower with concentration of 50 and 200 mg/kg of mice weight has been significantly increased time of movement and decreased time of move less in samples; and these all shows depression mood. According to results, passion flower hydro alcoholic extract in 50 and 200 mg/kg could reduce the depression and acted like fluoxetine. Therefore, it is recommended as a replacement for fluoxetine.

Key words: depression, fluoxetine, passion flower, forced swimming test

---

INTRODUCTION

Experts with psycho-behavioral hygienic sciences have agreement about this matter that depression is a commonest and the most basic disease in the past two decades and according to the international reports, 15% of people suffer from this disorder [1].

Depression is a commonest temper disorder and at least has four symptoms such as changes in weight and appetite, changes in sleep and activity, felling of crime, thought and decision problems and thought to self-murder[2].According to the social and familial problems and also the risk of self-murder associated with depression, treatment programs gains more importance. Although using chemical drugs are among the most effective methods to deal with this disorder, but about one third of patients have no response to them, or shows several side effects after consuming these drugs. Thus finding new drugs with lower side effects is an important improvement on treatment of depression disorders. At the other hand, medical plants introduces as an important source for finding new drugswith lower side effects [3].

Fluoxetine is a drug that has role in treatment of depression. It is an aromatic loop that is derived from propyl amine and has anti-depression properties. It is a powerful drug and selective serotonin reuptake inhibitor (SSRI) that leads to reuptake of 50% of serotonin released in the synapsis space [4].

Fluoxetine is the first selective serotonin reuptake inhibitor (SSRI) that present at the 1987 and altered attitudes about depression. In later years, this drug family expanded and beside to depression covered wider range of disorders such as shock, universal anxiety, boredom before catamenia, social anxiety and eating disorder. Fluoxetine is available in the forms of 10 and 20 mg capsule, lineolated 10 mg tablet, liquid (20 mg / ml) and capsules with 90 mg cover. Insomnia is one of the side effects of fluoxetine consumption. As possible as, it should be used at the morning to minimum the adnauseam. Due to the long half-life of this drug, four weeks is need to obtain stable concentration. For minimizing the primary side effects of this drug such as anxiety and dysphoria, some physicians begin medication of fluoxetine from the point of 5 to 10 mg per day [3].

Research for finding effective drugs with low side effects has attracted a large amount of media attention in recent years. Medical plants are one of the existent options for deal with some illnesses. Since effective material in the medical plants in associated with other substances are at biological balance, so cannot accumulate in the body and has no side effects, and hence has significant dominant than other chemical ones. The use of medical plants has an ancient history in Iran. Some medical plants even has been called holy in the past centuries in this country [5].

Passion flower contains alkaloids indole (Harman, Harmine, Harmole, and Harmaline), flavonoids (Orintine, Isoorintine, Vitexine and Isovitexine), glusids, phenolic components, sterols and volatile substances. This plant has calmative anti-hysteria properties and is using to deal with insomnia, nerves asthenia, and hysteresis. It has sedative and anti-spasmodic effects. It has been cleared that flavonoids are responsible for plant's medical nerves function and its hydro alcoholic extract has anti-anxiety activity. It has also flavonoid Crayzin that is responsible for anti-oxidative and anti-anxiety activities [6].

Passion flower (*Passiflora incarnate* Linnaeus) is a perennial plant with 8-9 m woody ascending stem that mounting up with aid of tendrils and peripheral backrests [7].

Flowers has violet or blue filamentous epiphysis; stamens has large golden anthers; multi branches stigmas placed horizontally at the end and wildly flattened on the top of flower; these features gives a watch-like shame to the plant [8]. This drug has been widely used to treat anxiety, hypotonia, pain, dyspepsia-derived muscular spasm, catamenia cramps, headache, migraine, neuralgia, generalize, hysteresis, neural existence and insomnia[9].

MATERIALS AND METHODS

In this study, fifty mice were kept in standard polycarbonate cages with steel network ceilings for two weeks to adapt to environment. Samples had free access to food and water, natural light, 20-22°^{c} temperature and 60% of humidity and kept in controlled room in light of temperature and humidity for 24 hours and all received enough amount of food and water. The time of experiment was between 9 am to 18 pm and condition was equal for all subjects. Samples were divided randomly into five groups: control, fluoxetine and 50, 100 and 200 mg/kg doses of extract. The extract was injected intraperitoneally.

Group of control comprises all subjects without injection of any drug or substance. Group of fluoxetine comprises all subjects with 1.4 mg/kg fluoxetine. Three remained groups comprises subjects with 50, 100 and 200 mg/kg of passion flower extract, respectively.

Extraction phase carry out after degrading washed plant samples and grinding them to create powdery ones; 100 gr of powdered samples weighted using digital scale, poured into sterile flesh and then suspend with adding 400 cc of alcohol ethylic.Suspend samples sealed off and kept in the cool place for 72 hours; after three days, components of flesh shacked for five minutes using shaker and then Watman paper used for purification of extraction; thus, the weight of this paper determined using digital scale; obtained mixture crossed through this paper and pure sample poured into new sterile flesh. Remained powders heated using heater at 50 degree of centigrade for 1.5 hours and dried powders weighted using digital scale. Related calculations carry out to reach for appropriate dose. Stock extraction was used to obtain pre-determined concentrations; so, concentrations of 50, 100 and 200 mg/kg prepared for each extraction.

To perform forced swimming test, a glassy container (L= 25 cm, H= 8 cm, W= 12 cm) was used and then filled with 25 $^{\circ}C$ water. Mice then put smoothly into the glass from the high of 20 cm. Any stop in the hand and foot functions recorded as a move less time. Total time of experiment was six minutes. At the first two minutes of the experiment, time of move less was no recorded for adapting the animal with water waves. After two minutes, mice movements kept under observation and times of move less was recorded using chronometer.

RESULTS AND DISCUSSION

The results of this study showed that prescription of 50 and 200mg/kg extracts leads to increase movement time in subjects (Figure 1).

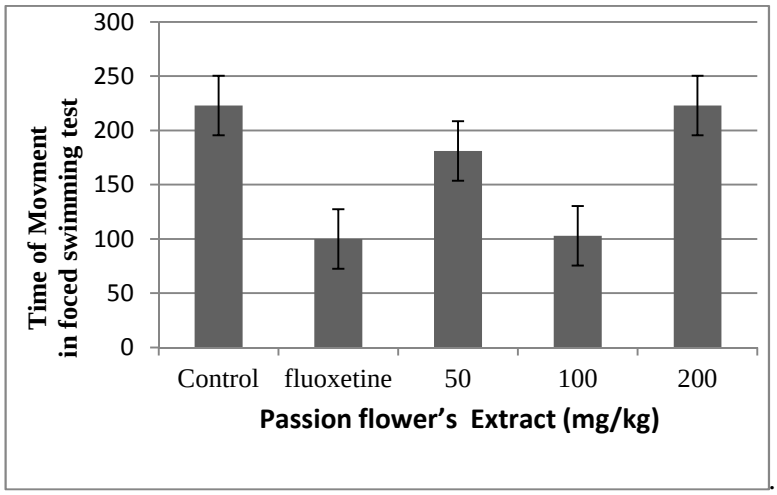

Fig 1: Time of movement in second at the forced swimming test in all groups

The time of move less was similar to control or less which shows significant effect of extract on reducing the depression in 50 and 200 mg/kg (Figure 2).

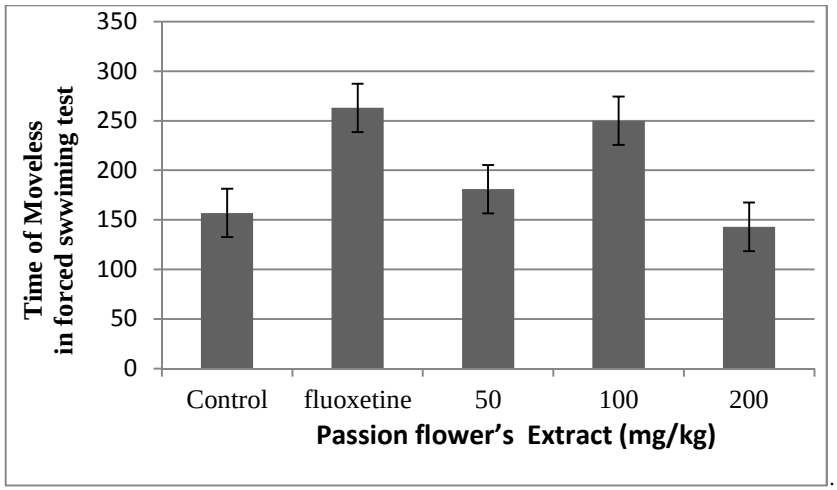

Fig 2: Time of moveless in second at the forced swimming test in all groups

The present study was to investigate the comparative effect of hydro alcoholic extract of passion flower on depression symptoms in tiny mice. The results of this study showed that hydro alcoholic extract of this plant at the concentrations of 50 and 200mg/kg of body weight can decrease depression in subjects and this effectiveness is comparable with the effect of fluoxetine. In pathology, decrease in function of some neurotransmitters such as serotonin, epinephrine and dopamine leads to depression and almost all chemical drugs with anti-depression properties increase function of at least one of these chemical messengers[10].

The results of this study showed that the hydro alcoholic extract of passion flower can increase the activity of at least one of the neurotransmitters that involves in depression such as serotonin, epinephrine and dopamine. There was a little research on dose-dependent extract of passion flower on depression symptoms and this study shows that extract of this plant can reduce symptom severity in patients. Previous studies also shows anti-anxiety effect of passion flower compared to diazepam in female mice [11].

Until the present time no study have been done on the dose-dependent anti-depression effects of passion flower compared to a synthetic drugs. There is no clear description with this matter that what components are in the extract of passion flower that can decrease depression severity. Previous researchers have shown that there is some amount

of flavonoid in this extract and it may react with dopamine receptors and inhibit them and thus can decrease depression symptoms in patients [12].

Itshould be said that dopamine receptors placed pre-synaptic on the dopamine terminals and inhibition of them leads to releasing dopamine as an effective neurotransmitter that can decrease depression severity [13]. In order to better understand of the effect of this extract, the investigation of interaction between extract and dopamine system can be suggested. At the other hand, studies on passion flower and component in its stem, leaf, flower and overhead organs showed that there is a large amount of flavonoid and alkaloid in this plant [14]. Based on these results, the investigation of passion flower in light of existence of other substances that may have anti-depression properties seems to be necessary.

In conclusion, depression as a commonest disorder has economic, emotional and social costs for patients and their families. It was estimated that 12 months procedure mice of this disorder is about 2.9 to 12.6% [15]. It seems that 50 and 200mg/kg hydro alcoholic extract of passion flower, compared with fluoxetine, can significantly decrease depression symptoms in mice and it means that this study can be as a guide for finding similar anti-depression drugs with plant origin.

CONCLUSION

In this study, the effect of hydro alcoholic extract of passion flower was assessed and according to the results, the investigation of hydro and hydro alcoholic extract of this plant and comparison of related results with the results of this study can be suggested. Chronic effects of this extract can also be assessed in future. Based on effectiveness of this extract on reducing depression, it can be suggest that its components be using phytochemical methods and the effective part of extract be used for preparation of better drugs.

REFERENCES

[1]Harington R. Therapeutic systems for depression in teenagers. Translated by TouzandehJani H, Kamal pour N. Tehran, Peyk-e-Farhang press,**2001**, 252
[2] Kaplan e and sadok, b. *Psychiatry-Psychiatry: Behavioral Science summary*. **2006**, 120-125
[3]Imam-ghoreysh M, Ghasemi F, Journal of Yasouj medical university. **2011**, 16(6), 527-536
[4]Cheng-Chen H, Min-Chen H, Li-Chin L, Borcherng S, Mei-Chich H. *Clinical Research*,**2005**, 11, 5327-5331.
[5]Khanavi M, Haji-akhondzadeh A, Amin GH, Shms-e-ardakani M.*Seasonal journal of ancient medicine in Islam and Iran*. **2010,** 1(1), 55-58
[6]Karachian N, AlaeiH, Ghoravinaeini M, Moghimi A, *Journal of physiology and pharmacology*, **2006**, 10(4), 313-321
[7]Zargari A, Medical plants, Tehran University press, **2002**, 1-154
[8]Ghahraman A, Plant systematic in Iran, vol 2, first edition, university press center, Tehran, **1992**, 652-656
[9]Kazemian A, Sereshti F, Forouzandeh N, Akbari N, 2006. *Journal of Ilam medical university*,**2006**,4(2), 41-47
[10]Beck AT, Alford BA. *Depression: Causes and treatment*. Pennsylvania University Press, **2009**, 234
[11]MahbobehRahimi, MehrdadModaresi, IlnazSajjadian, *Der Pharma Chemica*,**2016**, 8(3), 60-63
[12]Kılıçgün H, Altıner. 2010. D. *Pharmacogn Mag*.**2010**, 6, 238-41
[13] Mann JJ. *NEngl J Med*, **2005**, 353, 1819-34.
[14]Vafaei A., Mollashahi Z., Zahedi M.andTaherian A. Sabzevar *Journal of Medical Sciences.* **2008**, 15(2), 65-72.
[15]Farhadi A, Khorasgan Azad University of Isfahan, *college of educative science and general psychology*, **2015,** 15