Antidepressant Effect of *Crocus sativus*: an Evidence Based Review

Kamalipour M (B.Sc.)[1], Jamshidi A.H (Ph.D.)[2], Akhondzadeh S (Ph.D.)[1]*

1- Psychiatric Research Center, Roozbeh Psychiatric Hospital, Tehran University of Medical Sciences, Tehran, Iran
2- Department of Pharmacognosy & Pharmaceutics, Institute of Medicinal Plants, ACECR, Karaj, Iran
*Corresponding author: Psychiatric Research Center, Roozbeh Psychiatric Hospital, Tehran University of Medical Sciences, South Kargar Street, Tehran 13337, Iran
Tel: +98-21-88281866, Fax: +98-21-55419113
Email: s.akhond@neda.net

Receive: 21 Nov. 2009 **Acceptance:** 20 Feb. 2010

Abstract

Depression is a heterogeneous disorder often manifested with symptoms at the psychological, behavioral and physiological levels. Full remission is achieved in fewer than 50% of patients. Therefore, antidepressant or medications that achieve a better rate of success are urgently needed. Herbal medicine has a long and respected history, and holds a valuable place in the treatment of depression. According to medical studies, saffron can be used to treat depression. This paper reviews the clinical studied regarding the antidepressant effect of saffron

Keywords: ***Crocus sativus,*** **Saffron, Antidepressant**

[DOR: 20.1001.1.2717204.2010.9.33.21.7]

Depression has come more and more to the forefront in health care in recent years. Depression is a psychological disorder that affects many people. There are many types of depression that can range from mild to extremely severe. Depression occurs mainly as a result of unbalances neurotransmitters in the brain. There are four types of neurotransmitters known as serotonin, dopamine, norepinephrine, and GABA. The main neurotransmitter associated with depression is seratonin. Most antidepressants are used to increase the amount of serotonin in the brain and allow the reuptake to take place. By balancing the neurotransmitters, depression can be treated and become easier to handle for most people who suffer [1].

The advent of the first antidepressants- the Monoamine Oxidase Inhibitors (MAOIs) and Tricyclic Antidepressants (TCAs) in the 1950s and 1960s represented a dramatic leap forward in the clinical management of depression. The subsequent development of the Selective Serotonin Reuptake Inhibitors (SSRIs) and the Serotonin Norepinephrine Reuptake Inhibitor (SNRI) venlafaxine in the past decade and a half has greatly enhanced the treatment of depression by offering patients medications that are as effective as the older agents but are generally more tolerable and safer in an overdose [1]. The introduction of atypical antidepressants, such as bupropion, nefazadone, and mirtazapine, has added substantially to the available pharmacopoeia for depression. Remission of major depression is difficult to achieve for many patients and less than 50% of depressed patients will respond to standard treatments. For patients who are not responding adequately to an initial antidepressant medication, the two main approaches are switching/augmentation or alternative medicine including herbal medicine [1].

Herbal medicine has a long and respected history, and holds a valuable place in the treatment of mental/emotional disorders such as anxiety and depression as well as the vast majority of health problems. Utilizing the leaves, flowers, stems, berries, and roots of plants to both prevent and treat illness, herbal medicine not only helps to alleviate symptoms but also helps treat the underlying problem, as well as strengthen the overall functioning of a particular organ or body system [2, 3].

Saffron (*Crocus sativus*) is a spice derived from the flower of the saffron crocus (*Crocus sativus*), a species of crocus in the family Iridaceae. The flower has three stigmas, which are the distal ends of the plant's carpels. Together with its style, the stalk connecting the stigmas to the rest of the plant, these components are often dried and used in cooking as a seasoning and coloring agent. Saffron, which has for decades been the world's most expensive spice by weight, is native to Iran. It was first cultivated in the Persian Empire [2, 3]. Saffron is characterized by a bitter taste and an iodoform- or hay-like fragrance; these are caused by the chemicals picrocrocin and safranal. It also contains a carotenoid dye, crocin that gives food a rich golden-yellow hue. These traits make saffron a much-sought ingredient in many foods worldwide. Saffron also has medicinal applications [3, 4]. Saffron tastes bitter and contributes a luminous yellow-orange coloring to foods. Because of the unusual taste and coloring it adds to foods, saffron is widely used in Persian, Arab, Central Asian, European, Indian, Iranian, Moroccan and Cornish cuisines. Confectionaries and liquors also often include saffron. Medicinally, saffron has a long history as part of traditional healing; modern medicine has also discovered saffron as having anticarcinogenic (cancer-

[DOR: 20.1001.1.2717204.2010.9.33.21.7]

suppressing), anti-mutagenic (mutation-preventing), immuno-modulating, and antioxidant-like properties. Saffron has also been used as a fabric dye, particularly in China and India, and in perfumery [2].

According to medical studies, saffron can be used to treat depression. The clinical findings suggest that saffron is a safe and effective antidepressant. For example, in a randomized, double-blind study, 30 mg of saffron extract (in capsules) given for 6 weeks resulted in significant alleviation of depression compared to those on placebo, and did so without evident side effects [2]. This study was a follow-up to a preliminary trial in which the same saffron preparation performed as well as imipramine for treating depression in a double-blind trial [3]. In further preliminary work, saffron was compared to the drug fluoxetine; it was found that saffron performed as well as the drug in the treatment of depression [4]. The same research group reported that petal of *Crocus sativus* in addition to stigma has antidepressant effect [5, 6]. Furthermore, Agha-hosseni et al (2007) in double blind placebo controlled trial reported that saffron extract may ease the symptoms of premenstrual symptoms including depression [7-11].

In conclusion from the above mentioned clinical studies it seems that saffron has at least, grade two of evidence for its antidepressant effect.

References

1. Akhondzadeh S, Jafari S, Raisi F, Nasehi AA, Ghoreishi A, Salehi B, Mohebbi-Rasa S, Raznahan M, Kamalipour A. Clinical trial of adjunctive celecoxib treatment in patients with major depression: a double blind and placebo controlled trial. *Depress Anxiety* 2009; 26: 607 - 11.

2. Akhondzadeh S, Tahmacebi-Pour N, Noorbala AA, Amini H, Fallah-Pour H, Jamshidi AH, Khani M. *Crocus sativus* L. in the treatment of mild to moderate depression: a double-blind, randomized and placebocontrolled trial. *Phytother Res.* 2005; 19: 148 - 51.

3. Akhondzadeh S, Fallah-Pour H, Afkham K, Jamshidi AH, Khalighi-Cigaroudi F. Comparison of *Crocus sativus* L. and imipramine in the treatment of mild to moderate depression: a pilot double-blind randomized trial [ISRCTN45683816]. *BMC Complement Altern Med*. 2004; 4: 12.

4. Noorbala AA, Akhondzadeh S, Tahmacebi-Pour N, Jamshidi AH. Hydroalcoholic extract of Crocus sativus L. versus fluoxetine in the treatment of mild to moderate depression: a double-blind, randomized pilot trial. *J. Ethnopharmacol*. 2005; 97: 281 - 4.

5. Moshiri E, Basti AA, Noorbala AA, Jamshidi AH, Hesameddin Abbasi S, Akhondzadeh S. *Crocus sativus* L. (petal) in the treatment of mild-to-moderate depression: a double-blind, randomized and placebo controlled trial. *Phytomedicine* 2006; 13: 607-11. 16979327.

6. Akhondzadeh Basti A, Moshiri E, Noorbala AA, Jamshidi AH, Abbasi SH, Akhondzadeh S. Comparison of petal of *Crocus sativus* L. and fluoxetine in the treatment of depressed outpatients: a pilot double-blind randomized trial. *Prog. Neuropsychopharmacol Biol. Psychiatry* 2007; 31: 439 - 42.

[DOR: 20.1001.1.2717204.2010.9.33.21.7]

7. Akhondzadeh S. Hippocampal synaptic plasticity and cognition. *J. Clin. Pharm. Ther.* 1999; 24: 241 - 8.

8. Akhondzadeh S, Rezaei F, Larijani B, Nejatisafa AA, Kashani L, Abbasi SH. Correlation between testosterone, gonadotropins and prolactin and severity of negative symptoms in male patients with chronic schizophrenia. *Schizophr. Res.* 2006; 84: 405 - 10.

9. Akhondzadeh S, Abbasi SH. Herbal medicine in the treatment of Alzheimer's disease. *Am J. Alzheimers Dis. Other Demen.* 2006; 21: 113 - 8.

10. Akhondzadeh S, Safarcherati A, Amini H. Beneficial antipsychotic effects of allopurinol as add-on therapy for schizophrenia: a double blind, randomized and placebo controlled trial. *Prog. Neuropsychopharmacol. Biol. Psychiatry* 2005; 29: 253 - 9.

11. Agha-Hosseini M, Kashani L, Aleyaseen A, Ghoreishi A, Rahmanpour H, Zarrinara AR, Akhondzadeh S. *Crocus sativus* L. (saffron) in the treatment of premenstrual syndrome: a double-blind, randomised and placebo controlled trial. *BJOG* 2008; 115: 515 - 9.

[DOR: 20.1001.1.2717204.2010.9.33.21.7]