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Anti Anxiety Effect of Ghavoot: A Traditional Nutrient Preparation

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ABSTRACT

Ghavoot is an Iranian preparation composed of a combination of different plant seeds which has been prepared in a specific manipulation. This drug has different traditional uses which has never been studied scientifically. In the present study, the anti anxiety effect of Ghavoot has been studied in mice using Elevated Zero Maze (EZM) method. The animals received the Ghavoot at doses of 12, 18 and 24 g kg⁻¹ orally for 14 days. The anxiolytic effect of test groups was compared to diazepam on the basis of animal behaviors on 15th day of experiment. The time spent in the open arms, number of open arm entries, number of animal stretching, line crossing and deep heading of animal on open edges were measured for 5 min. All of the experiment were done at the time of 9-13 a.m. The results showed that Ghavoot significantly ($p < 0.05$) elevated the time spent on the open arms and open arm entries at dose of 24 g kg⁻¹ in comparison to control group, without significant changes in the other parameters. The results here provide scientific evidence that Ghavoot has potential anti anxiety effect in mice.

Key words: Ghavoot, anti anxiety, elevated zero maze, folk medicine

INTRODUCTION

In Iranian folk medicine, many natural preparations have been used for the treatment of diseases, especially in mild disorders (Zargari, 1972). Kerman is the largest province in south eastern of Iran which is far from the center and has mostly itself especial culture and diverse flora as well as ethnic populations with different ways of manipulation which often guarded secret. Despite of progress of modern health care systems, traditional medicine is a part of the people's culture. Ghavoot is one of these crude nutrients with a long history on usage in Kerman folk medicine where it is used mostly as analgesic, anti anxiety, memory enhancing, anti inflammatory, augmentation of resistance of the body against disease and for providing the physical and mental health (Moghimizadeh, 2008). Despite of widely uses as a folk medicine, it has been lesser investigated scientifically. One of the most benefits of Ghavoot is providing an anti-stress property and promoting mood stabilization. Anxiety is a common symptoms of many of disorders which can

lead to some disabilities in daily activities and inducing a feeling of fear and worrying which all might disturb the usual function (Gupta and Rana, 2007). Benzodiazepines are the most widely used drugs in the current therapeutic use. There is an interest for finding new therapeutic agents considering the common side effects of benzodiazepines. In this study it was intended to investigate the anti anxiety effect of Ghavoot using Elevated Zero Maze (EZM) method.

MATERIALS AND METHODS

Animals: Male NMRI mice weighing 25-30 g were used for the study. The animals were obtained from the Neuroscience Research Center, Kerman University of Medical Sciences. They were housed in a room temperature of $22\pm 2^{\circ}\text{C}$ at 12 h light:12 h dark cycle and had free access to food and water. Groups of 6 animal each were used in all tests. Animals were acclimatized to the laboratory for at least 1 h before testing and were used for one experiment only. This study complied with current ethical regulations on animal research (National Research Council of USA, 1996) and related rules of our school (EC/KNRC/88-3) and all animals used in the experiment received humane care.

Drugs and materials: Ibuprofen powder (Hakim Pharmaceutical Co. Ltd., Iran), Carboxymethyl cellulose-sodium (CMC-Na, Iran); zero maze apparatus (Iran) and Hot plate (Poua armaghan-Iran) were used in the present study.

Ghavoot preparation: Ghavoot was prepared in its traditional formulation including a combination of eleven plant seeds: *Portulaca oleracea* 10%, *Hordeum vulgare* 10%, *Coriander sativum* 5%, *Coffea arabica* 5%, *Linum usita-tissimum* 5%, *Nigella sativa* 5%, *Lactuca sativum*, *Elletaria cardamom*, *Myrtus communis*, *Papaver somniferum* and *Canabbis sativa* (each 2%) and sugar to 100% (g/g). The seeds of each plant were roasted at first, milled and mixed all together with sugar in a hot blender (Moghimizadeh, 2008).

Treatment animals: The amount of daily food was determined in animals. The dose was used on the basis of human consumption. At the first, Ghavoot was mixed with the animal's food in different percents and was given orally to test animals at three doses of 12, 18 and 24 g kg^{-1} weight of animal. Control group received the same diet except the Ghavoot. Ghavoot was replaced by ibuprofen at dose of 100 mg kg^{-1} in positive control. The weight of animals was measured at the end of experiment.

Elevated zero maze test (EZM): The test was performed based on the method described previously with some modifications (Shepherd *et al.*, 1994). The apparatus is made up of an open flat wooden ring (inner edge diameter 50 cm outer edge 60 cm) which is divided into four sections with walls with 15 cm height. The apparatus was raised 50 cm height from the floor. Briefly mice were placed on the platform and a video camera was used to record the animal's behaviors. The time spent in the open arms, number of open arm entries, number of animal stretching, line crossing and deep heading of animal on open edges were measured for 5 min. All of the experiment was done at the time of 9-13 a.m.

RESULTS

Animal stretching, line crossing and deep heading in EZM: The results of animal stretching, line crossing and deep heading into open arms in EZM method have given in Table 1.

Table 1: The anxiolytic effects of different doses of Ghavoot in zero elevated method in mice

| Groups | Elevated zero maze | | |
|-------------------------------------|--------------------|-----------|---------|
| | SAPN | LCN | HDN |
| Control | 4.0±1.8 | 39.7±11.7 | 3.8±2.7 |
| Ghavoot (12 g kg ⁻¹) | 4.9±2.1 | 40.3±12.3 | 4.9±1.2 |
| Ghavoot (18 g kg ⁻¹) | 2.7±1.9 | 39.9±10.1 | 3.5±1.1 |
| Ghavoot (24 g kg ⁻¹) | 4.4±2.1 | 38.9±5.0 | 3.5±1.3 |
| Diazepam (0.5 mg kg ⁻¹) | 3.8±1.8 | 30±13.1 | 5.3±2.1 |

Values are Mean±SEM (n = 6), SAPN: Stretching attend posture number, LCN: Line crossing number, HDN: Head dipping number

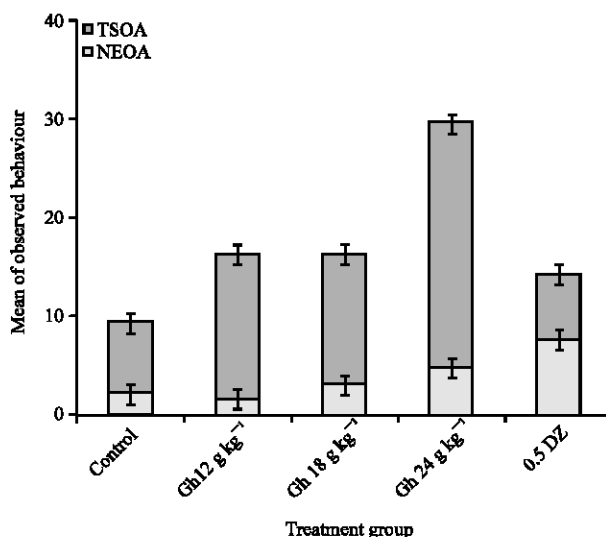


Fig. 1: The anxiolytic effect of Ghavoot (Gh) group in zero elevated maze method in comparison to control TSOA: Time spent in open arm, NEOA: Number of entry to open arm. Values are Mean±SEM (n = 6)

As shown, although there is a decrease in measured parameters in test groups in comparison to control, no significant difference was observed in any doses of Ghavoot ($p > 0.05$) in comparison to control (Table 1).

Time spent and number of entries of animal to open arms in EZM method: The results of measuring of two important parameters of time spent and number of entries of animal to open arms in EZM method have shown in Fig. 1. These results indicated that the time spent by animal was significantly increased in animals receiving Ghavoot (24 g kg⁻¹) and diazepam in comparison to control group ($p < 0.05$) (Fig. 1). Ghavoot also caused a significant increase in the number of open arm entries at dose of 24 g kg⁻¹.

DISCUSSION

Ghavoot is a crude natural preparation which has different traditional uses such as analgesic, memory enhancing, anti tiredness and anti anxiety. In his study, its anti anxiety effect has been evaluated scientifically. The results of EZM showed that Ghavoot significantly increased both the time spent on open arm and the open arm entries at dose of 24 g kg⁻¹ while no significant

changes were observed in the other parameters with any doses of Ghavoot ($p > 0.05$). The reduction in time spent in open arm or open arm entries are considered as markers of high level of anxiety (Pemminnati *et al.*, 2010). Ghavoot exhibited no effect on number of line crossing which is a reflect of tendency of animal to activity. These results also showed that Ghavoot in contrast to benzodiazepines, induced neither sedation nor impaired the motor coordination in animal (Table 1). There are some previous reports about anti anxiety effect of *P. oleracea*, *C. sativum*, *N. sativa*, *C. arabica* and *L. sativa* which comprise more than 27% of Ghavoot (Emamghoreishi and Hamedani, 2008; Komaki, 2008; Miladi-Gorji *et al.*, 2006; Perveen *et al.*, 2009; Tambara, 2007). Anxiety and chronic depression are the most signs of inflammatory process followed by increasing the level of cytokines and prostaglandins (Muller *et al.*, 2006). The relation between anxiety and increasing the level of inflammatory cytokines has been proven (Lacosta *et al.*, 1991) so, it is expected that the anti inflammatory substances can relieve anxiety. The presence of a combination of plant's seeds components with different mechanisms of anti inflammation effect (Ghannadi *et al.*, 2005; Chan *et al.*, 2000; Sayyah *et al.*, 2004) might be responsible for anti anxiety effects of Ghavoot. However, for determining its accurate mechanisms it is needed to do further studies.

CONCLUSION

The results of present study provides an important implication that Ghavoot could be as an important traditional strategy for relieving anxiety with scientific basis and more pharmacologic studies can help for understanding the pharmacodynamic of this preparation.

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