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Research paper

Effect of lavender essential oil as a prophylactic therapy for migraine: A randomized controlled clinical trial

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ABSTRACT

There is no cure for migraine, but preventive treatments are usually applied to reduce the frequency and severity of headache attacks. The purpose of this study was to investigate the effect of lavender as a prophylactic therapy for migraine in a randomized controlled clinical trial. This double-blind and placebo-controlled study was conducted over a period of three months. Patients were assessed for migraine impact at the baseline and at the end of the study, using the Migraine Disability Assessment Scores (MIDAS) questionnaire. In the case group, after three months of lavender therapy, the MIDAS score was reduced. The reduction in MIDAS score was significant ($P < 0.05$), when compared to the baseline and also control group. During the treatment, participants did not report any complaints or side effects. The results of this present study report that the frequency and severity of migraine incidents were reduced in those participants using lavender therapy during the three month trial.

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1. Introduction

Migraine is influenced by various factors such as diet, hormonal disorders, digestive problems, autoimmune disturbances, structural imbalances, mental stress and lifestyle (Fantasia, 2014). It is a common and disabling disorder amongst adults and children, although it more often affects women (Magis and Schoenen, 2011). Irrespective of age, migraine can spontaneously occur in an individual, but migraine often starts between ages 10 and 30 (Magis and Schoenen, 2011). The migraine pain is often accompanied by a variety of symptoms which may include nausea, blurred vision, vomiting, sensitivity to light, and noise (Fantasia, 2014).

The following medications are commonly used to prevent migraine: beta-blockers, flunarizine, topiramate, valproate, amitriptyline, venlafaxine, gabapentin, magnesium and botulinum toxin type A (Chayasirisobhon, 2013). None of the drugs used in migraine prophylaxis are uniformly effective for patients. There are minimal but still reported side effects associated with common medications (Chayasirisobhon, 2013; Prior et al., 2010).

There is no cure for migraine, but supplements and medicinal herbs can be used to prevent migraine attacks and reduce the

frequency and severity of a headache (D'Amico et al., 2006; Lipton et al., 2003). In addition, the use of traditional medicine and medicinal plants is increasing worldwide. Therefore, the study of their clinical efficacy and the conduct of further clinical trials regarding medicinal herbs is required as a matter of priority. The results of such research can be used for further investigations into pharmaceutical formulations and also to improve our knowledge regarding herbal medicine treatment in its own right. Some medicinal herbs have shown capability in the treatment of migraine prophylaxis. Feverfew (*Tanacetum parthenium*), for example, was found to be effective in the prevention of migraine. The active constituents of feverfew are sesquiterpene and lactones, especially parthenolide (Johnson et al., 1985; Bohlmann and Zdero, 1986; Murphy et al., 1988). Butterbur (*Petasites hybridus* root) has shown efficacy in migraine prophylaxis (Lipton et al., 2004). This plant acts by the inhibition of peptide leukotriene biosynthesis and interference in the inflammatory cascade associated with migraine (Eaton, 1998; Sheftell et al., 2004; Grossman and Schmidrums, 2000).

The genus *Lavandula* (common name: lavender) is comprised of about 25–30 species of flowering plants in the Lamiaceae (Labiatae) family (Behbahani et al., 2013; Effati-Daryani et al., 2015). Native to France and the western Mediterranean these flowering plants are cultivated worldwide for their volatile oil (Behbahani et al., 2013; Effati-Daryani et al., 2015). The leaves of

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lavender can be used in aromatherapy; lavender aromatherapy shows positive effects on hemodynamic indices among patients with acute coronary syndrome (Nategh et al., 2015). In another study, lavender essential oil was found to reduce the level of anxiety in patients undergoing coronary artery bypass graft surgery (Seifi et al., 2014). A recent evaluation showed the positive effect of lavender essential oil, in reducing anxiety in patients undergoing curettage. It may therefore be concluded that lavender aromatherapy can be used in supportive therapy alongside orthodox treatment (Bakhsha et al., 2014).

Lavender essential oil has been used traditionally for the treatment of colds, digestion, flatulence, upset stomach, liver, gallbladder problems and loss of appetite (Katona et al., 2010; Kim et al., 2007). In addition, this genus is beneficial for stress, anxiety, exhaustion, headaches, migraines, insomnia and depression (Seifi et al., 2014; Katona et al., 2010; Kim et al., 2007). *Lavandula stoechas* L. which is generally called Ustkhuddus in the Persian language, is a low-growing and evergreen herb (Lim, 2014). There are some reports about its spasmolytic (Gedney et al., 2004), sedative (Buchbauer et al., 1991), antihypertensive (Koto et al., 2006), antimicrobial (Inouye et al., 2001) and antifungal (D'Auria et al., 2005) properties. Moreover, the analgesic effect of lavender oil has been investigated in previous studies (Yip and Tse, 2006; Gedney et al., 2004). The efficacy of lavender oil in anxiety disorders has also been reported (Morris, 2002). The purpose of this study was to

investigate the effect of lavender essential oil as a prophylactic therapy for migraine in a placebo-controlled clinical trial.

2. Materials and methods

2.1. Preparation of lavender essential oil and placebo

The aerial parts of *L. stoechas* L. were collected from the Zardband Botanical Garden of Iran in May 2014. Identification and authentication was carried out by botanists in Zardband Botanical Garden and a voucher specimen deposited in their herbarium. The samples were crushed and the essential oil was obtained by the hydrodistillation method using a Clevenger type apparatus (Advanced Technocracy Inc., India), according to the European Pharmacopoeia (1975) (Maisonneune, 1975; Golfakhrabadi et al., 2015). The oil was dried over anhydrous sodium sulphate and kept at 4 °C in a sealed brown vial until required. 1 ml of essential oil was obtained from 100 g of the dried plant. The oil yield of the plant was determined as 1% v/w. This essential oil was dissolved in a hydroalcoholic solvent (ethanol/water 80/20) and was decanted into 20 ml bottles. The ratio of essential oil to solvent was 1:3. The lavender extract was standardized based on linalyl acetate (0.6%) and linalool (0.4%).

The placebo was prepared using the hydroalcoholic solvent with a number of approved color additives added to have the same

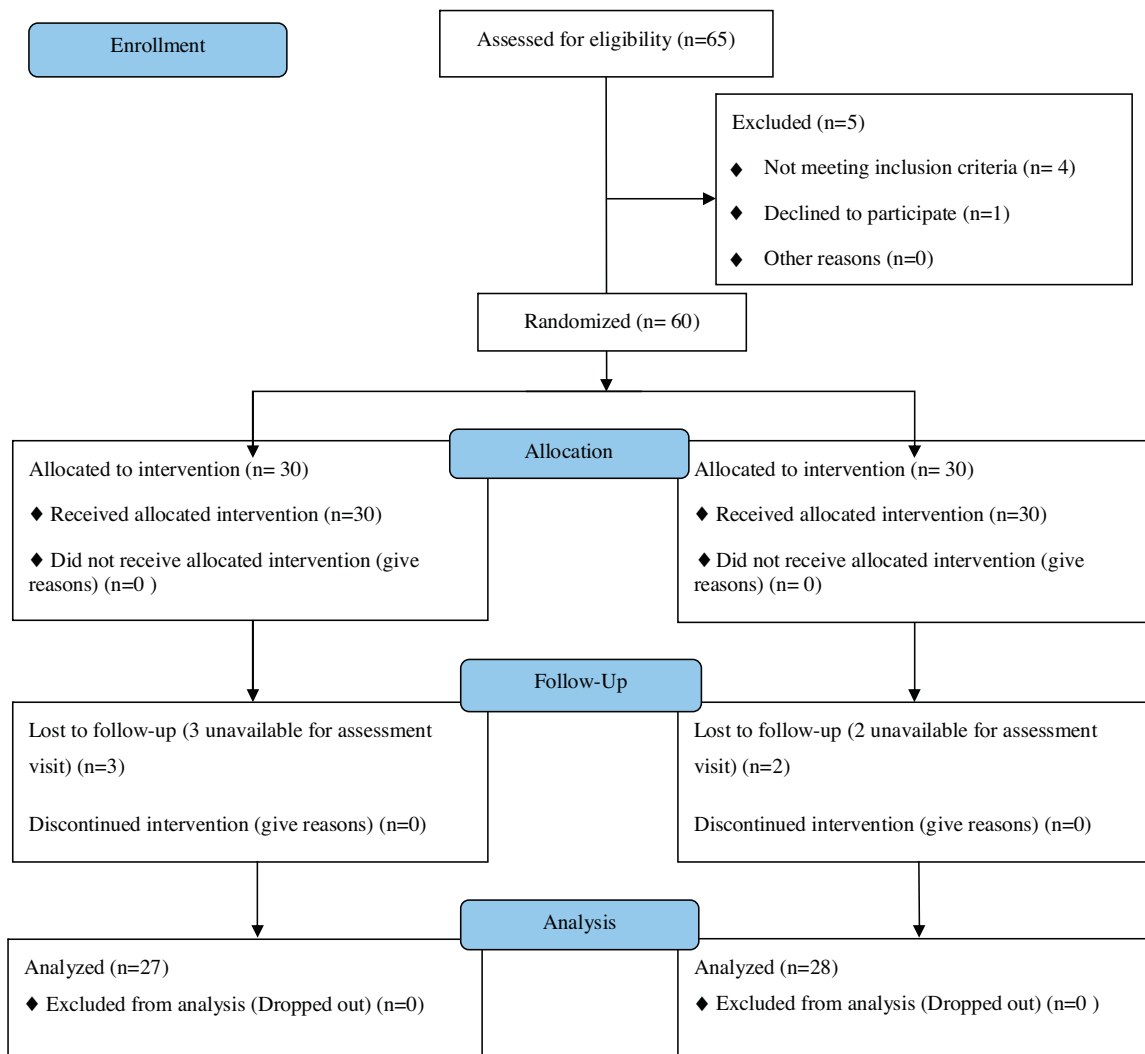


Fig. 1. Study flowchart (CONSORT format).

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