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Original Research

Topical Application of Chamomile Oil in Combination with Dry Cupping for Dysmenorrhea: A Quasi-Experimental Study

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Abstract

Dysmenorrhea has a negative impact on women's daily activities and quality of life. The purpose of this study was to investigate the effect of topically applied chamomile oil along with dry cupping on dysmenorrhea. A total of 12 patients with dysmenorrhea were included in this quasi-experimental study and treated for three consecutive cycle periods. One mL of chamomile oil was gently massaged on the skin of the suprapubic area for 10 minutes once every night. After the massage, dry cupping was done. During the study, patients were visited on the third day of menstruation for three consecutive cycles, and mean pain was evaluated and recorded based on the visual analog scale (VAS). The mean ± SD of pain intensity in three cycles before the study was 7.5 ± 0.43 and in three cycles after the interventions was 1.44 ± 0.33 (P= 0.002). Indeed, the pain score was decreased as 86.72±1.12% due to the interventions. All the patients discontinued using the analgesic during the study. Topical application of chamomile oil and dry cupping significantly reduced the severity of pain during menstruation and it could be considered as a low-cost modality without side effects for dysmenorrhea. Further studies with larger sample size and longer follow-up are recommended.

Keywords: Dysmenorrhea; Chamomile oil; Cupping; Traditional medicine

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Introduction

Dysmenorrhea refers to chronic and recurrent menstrual cramps of uterine origin and considered as a common gynecological complaint among both young and adult females in their reproductive age [1]. It has a global prevalence of 45% to 95% in women of reproductive age and also has a negative impact on their quality of life [2,3]. Common medical therapy available to control menstrual cramps include non-steroidal anti-inflammatory drugs (NSAIDs), oral contraceptive pills (OCPs) and so on. Both NSAIDs and OCPs decrease myometrial activity (uterine contractions), which can provide relief of pain and symptoms [4,5]. Despite the benefits and specific therapeutic effects of these methods, a number of women with dysmenorrhea not respond adequately to them and some others withdraw these treatments for their adverse effects [4]. In the last decade, there is a growing trend towards using both conventional and complementary and alternative medicine (CAM) in patients with gynecological disorders [6,7]. The use of CAM has been considered as potential option for management of dysmenorrhea [4,5]. Dry cupping therapy is a well-known CAM practice, which has been widely used in different countries. In the traditional Persian medicine (TPM) and traditional Chinese medicine (TCM) cupping therapy has therapeutic effects for abnormal uterine bleeding and dysmenorrhea [6,7]. Recent studies have also shown the therapeutic effects of cupping therapy on a wide range of diseases, including dysmenorrhea [7-11].

Matricaria chamomilla L. (commonly known as chamomile) is a well-known medicinal plant species from the Asteraceae family. Chamomile has revealed anti-inflammatory and analgesic activities. This plant contains phytoestrogens and chamomile tea and oil is effective in reducing pain during menstruation [12]. Several studies have shown the effects of oral chamomile on reducing pain and menstrual bleeding in dysmenorrhea [3]. According to TPM, topical use of chamomile oil has analgesic activities and has been introduced for treatment of various medical conditions [13]. The topical application of chamomile oil had analgesic effects and improvement of symptoms in patients with severe carpal tunnel syndrome [13], knee osteoarthritis [14], episiotomy in primiparous women [15] and infant colic [16]. However, the effect of topically applied chamomile oil for dysmenorrhea have not been studied so far. In this quasi-experimental study, we documented the effectiveness of applying chamomile oil in combination with dry cupping therapy on dysmenorrhea.

Materials and Methods

Plant material

Chamomile oil (Babouneh herbal oil) was the product of Talaye Sabz Tuba Company, Tehran, IRAN (IRC Code: S-94-0489). The ingredients of this product include chamomile flowers, fenugreek seeds and sesame oil.

Study design

The present quasi-esperimental study was carried out in Behesht traditional medicine outpatient clinic affiliated to Iran University of Medical Sciences, Tehran, Iran in a period of 5 months from April to September 2021. The study protocol was reviewed and approved by the Medical Ethics Committee of Iran University of Medical Sciences [Code: IR.IUMS.REC.1400.732]. The objectives and details of the study were explained and then written informed consent was obtained from all the participants before commencement of the study.

Study participants

A total of 12 out-patients with confirmed dysmenorrhea due to polycystic ovarian syndrome (PCOS) were enrolled in the study. The diagnosis of PCOS was made in the obstetrics and gynecology outpatient clinic based on the Rotterdam diagnostic criteria (Two out of the three features of PCOS, including oligo/amenorrhea, hyperandrogenism, and polycystic ovaries on the ultrasound) [17]. Patients who had a history of secondary dysmenorrhea due to the other causes, pregnancy or suspected pregnancy at the time of registration, and those who planned to give birth during the study period were excluded from the study. They had been used mefenamic acid (MFA) to reduce menstrual pain for at least 3 months before they receive the interventions.

Evaluation

Response to treatment was evaluated by VAS pre and post intervention. The intensity of pain in pre-intervention cycles was measured by visual analog scale (VAS) for 3 consecutive cycle periods. At baseline, all patients were visited in the TPM outpatient clinic, and the intensity of pain was recorded with an 11-score VAS, in which zero indicates no pain, and 10 indicates the most severe pain they had experienced ever [18]. During the study, patients were visited on the third day of menstruation for three consecutive cycles, and mean pain was evaluated and recorded based on the VAS scale. All participants monitored regularly during the study period and any probable adverse events (AEs) recorded in the case report form (CRF) carefully.

Interventions

In this study topically applied chamomile oil combined with dry cupping were used for patients from 15th day of each menstrual cycle until the first day of the next menstrual cycle. This therapeutic plan was continued for three successive menstrual cycles as follows. One mL of chamomile oil was gently massaged

on the skin of the suprapubic area (on the abdominal wall between the umbilicus and the pubis) for 10 minutes once every night. The massage was performed with the palm of one hand in a reciprocating manner without additional pressure. After the massage, dry cupping was done. Three large size of glass cups with 3.5 cm in external diameter were placed on the same position for about 15 minutes. The patients were also allowed to take MFA when the pain severity was intolerable. Necessary training was given by an expert person and the patients were supposed to report the pain severity at the end of each cycle, the dosage of analgesic they used in each cycle, and any side effects.

Outcomes

The main outcome was the change in the pain intensity assessed by self-reporting on questionnaire compared with the baseline. Secondary outcomes were the maximum pain intensity and mean pain. Safety was regularly assessed by monitoring possible adverse events in each cycle.

Statistical analysis

Data were analyzed using the SPSS software (version: 17, SPSS Inc., Chicago, Ill., USA). Friedman test were used to present the changes of pain severity during the study. The pairwise comparisons were done using the

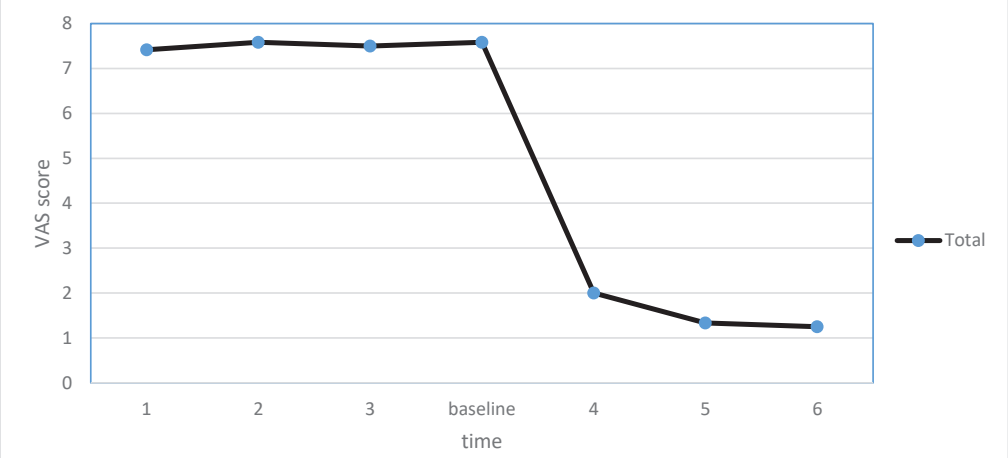

Figure 1. Pain sevrity during the study (1, 2, 3, and Baseline: before intervention, 4, 5, 6: after intervention)

Table1. Baseline and demographic characteristics of the participants

Age (year), mean ± SD	24.91 ± 7.1
Age of menarche (year), mean ± SD	12.25 ± 0.86
Age at onset of dysmenorrhea (year), mean ± SD	13.33 ± 1.23
Marriage status, n (%)	Married: 5 (41.6%) Single: 7 (58.3%)
Use of MFA (mg/day), mean ± SD	1416.66 ± 194.62

Abbreviations: SD, standard deviation; MFA, mefenamic acid

Table 2. The pain intensity before and after interventions

Time	Cycle 1 before intervention[a]	Cycle2- before intervention	Cycle3- before intervention	P value*	Baseline[b]	Cycle 1 after intervention	Cycle 2 after intervention	Cycle 3 after intervention	P value*
VAS (mean ± SD)	7.4 ± 0.51	7.58 ± 0.66	7.5 ± 0.67	0.74	7.58 ± 0.66	2 ± 0.73	1.33 ± 0.49	1 ± 0.00	<0.001
P value**		0.41	0.65			0.002	0.002	0.001	

*Friedman test, **Wilcoxon signed-rank test (comparison of each time with a), ***Wilcoxon signed-rank test (comparison of each time with b), SD: standard deviation

Wilcoxon signed-rank test.

Results

A total of 12 out-patients with confirmed diagnosis of dysmenorrhea completed the study. Patients were aged from 18 to 35 years and had received previous standard therapy for dysmenorrhea. The demographic details of the study participants are presented in table 1. Before the study, all participants received three consecutive cycles of MFA. They had moderate to severe menstrual pain pre intervention (VAS were between 4 and 10 points). And then they used the interventions another three consecutive cycles. The mean ± SD of pain in three cycles pre intervention was 7.5 ± 0.43 and in three cycles post interventions was 1.44 ± 0.33 (P= 0.002). Indeed, the pain score was decreased 86.72 ± 1.12% due to the interventions. The pain intensity before and after interventions is presented in table 2. All the patients discontinued using the analgesic during the study. The changes of pain severity is shown in figure 1. All patients well tolerated the preparation. There were no relevant adverse events.

Discussion

This quasi-experimental study is the first report on the effectiveness and tolerability of applying chamomile oil along with dry cupping therapy for dysmenorrhea. The findings of the study showed that the mean VAS score had significantly reduced post-intervention. All patients tolerated the preparations well and reported no relevant side effects. In addition, the patients did not use MFA during the study period.

In this study, we have used dry cupping therapy for patients with dysmenorrhea. The cupping therapy is a method to treat a wide range of disorders that has been used in different cultures since ancient time. Among its different types, dry and wet cupping are the two main types [19,20]. In the course of dry cupping therapy, several cups are employed over specific areas of the body surface for 15 to 20 minutes once or twice a day to create a vacuum without skin damage or bleeding. The number, size and duration of using the cups are determined based on the type of disease and the area used in the body [6].

Several clinical studies confirm that dry cupping alone or in combination with other treatments can significantly reduce the intensity of pain in dysmenorrhea as well as the amount of menstrual bleeding in menorrhagia [7,8,10]. Sultana et al. in a case series study evaluated the efficacy of dry cupping therapy on pain intensity of patients with dysmenorrhea aged between 12-37 years. The patients used two glass cup of medium size on suprapubic region for 15 minutes on the first or second day of the menstrual cycle and pain intensity was assessed by VAS. Pain intensity decreased significantly after cupping therapy [10]. Inanmdar et al. evaluated the efficacy of fenugreek seed and dry cupping on pain intensity in dysmenorrhea compared with MFA. Patients received dry cupping therapy two 4.2 cm and one 2.5 cm cups, which was applied below the umbilicus for 15 min on day 1 and 3 of menstruation along with 3 g of fenugreek seed powder twice daily from day 1 to 3 of menstrual cycle. They concluded that fenugreek seed plus dry cupping was as effective as MFA in reduction in total VAS score for pain intensity [8]. Mokaberinejad et al. showed that the treatment with fennel infusion plus dry cupping was able to significantly reduce pain intensity compared to metformin alone [7]. Cupping therapy has a beneficial role in improving the uterus and ovaries functions and is recommended for their impairments. Several mechanisms have been proposed regarding the possible therapeutic effects of cupping therapy, including increasing the production of endogenous opioids, muscle relaxation, reducing pain, increasing blood flow in the skin and muscles, stimulating the peripheral and autonomic nervous system, and modulating the immune system and hormonal regulation [6,19]. Previous study demonstrated the beneficial effect of *Matricaria chamomilla* L. in the treatment of dysmenorrhea. Treatment with chamomile in patients with dysmenorrhea could significantly reduce pain intensity and menstrual bleeding. Chamomile has analgesic and anti-inflammatory activities and can diminish the production of prostaglandins and leukotrienes in the endometrium as one of the main causes of pain in dysmenorrhea [3]. In a clinical study, topical application of chamomile was shown to have pain-reducing effects on episiotomy pain in primiparous women [15]. The flavonoids in chamomile have a strong inhibitory effect on the level of prostaglandin E2 and have an anti-inflammatory effect by affecting the COX-2 pathway like NSAIDs. Chamomile polyphenolic compounds can have anti-inflammatory effects by inhibiting pro-inflammatory biomarkers. These mechanisms can justify the anti-inflammatory and analgesic effects of topical use of chamomile oil [13,14].

Limitations of the study

This study had some limitations. One of the most important limitations was the lack of a control group. Moreover, the sample size of the study was small. In addition, measuring adherence to assessment recommendations, including cupping and massage had limitations. However, it is difficult to ensure outpatient practice. Therefore, during each medical appointment, doubts were resolved and patients' adherence was checked.

Conclusion

Using the chamomile oil massage and dry cupping together can be considered as a useful and safe comple-

mentary modality in amelioration of dysmenorrhea. Moreover, this intervention can be possibly used for those who do not tolerate NSAIDs due to digestive problems.

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Data Availability
Data and material from this trial are available upon reasonable request and approval by the corresponding author.

Conflict of Interest
The authors declare no conflict of interests.

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