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Effect of aromatherapy massage on pain in primary dysmenorrhea: A meta-analysis

Necdet Sut [a, *], Hatice Kahyaoglu-Sut [b]

[a] Trakya University Medical Faculty, Department of Biostatistics, Edirne, Turkey
[b] Trakya University, Faculty of Health Science, Department of Gynecology and Obstetrics Nursing, Edirne, Turkey

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ABSTRACT

Objective: This meta-analysis investigates the effect of aromatherapy massage on pain in primary dysmenorrhea.
Methods: Randomized controlled trials were searched by keywords in several databases (Pubmed, ISI Web of Sciences, and Google Scholar). Six randomized controlled trials that included 362 participants with primary dysmenorrhea, comparing abdominal aromatherapy massage (n = 184) with massage with placebo oils (n = 178), were analyzed in the meta-analysis. The change in the visual analogue scale (VAS) pain score from the first menstruation cycle to the second cycle at the first menstruation day was used as the primary outcome.
Results: Aromatherapy massage with essential oils was superior to massage with placebo oils (standardized mean difference = −1.06 [95% CI: −1.55 to −0.55]).
Conclusion: Abdominal aromatherapy massage with essential oils is an effective complementary method to relieve pain in primary dysmenorrhea.

1. Introduction

Dysmenorrhea is one of the most common gynecological complaints among women during menstruation, and it affects more than half of them [1–3]. It can be classified as primary or secondary. Primary dysmenorrhea is defined as painful menses that occurs just before or during menstruation in adolescent females who have normal pelvic examination results and normal ovulatory function. Secondary dysmenorrhea is defined as painful menses in women who have an identifiable gynecological pathology, and it is more common among women in the 40 to 50 age range [1,4].

The prevalence of primary dysmenorrhea can be varied, and it may be explained to the use of different samples [5]. The prevalence rates of primary dysmenorrhea were reported as follows: 70.2% in India [6], 89.1% in Iran [7], 52.07% in Georgia [8], 64% in Mexican university students [9], 87.8 in Turkish university students [10], 48.4% in Mexican high school students [11], 60% in Canada [12], and 80% in Australian high school girls [13]. The dysmenorrhea prevalence in women age 18–45 years in the USA was reported as 90% [14]. De Sanctis et al. reported that the prevalence of primary dysmenorrhea varied from 16% to 93%; the prevalence of perceived severe dysmenorrhea varied from 2% to 29% among girls [5]. The high prevalence of primary dysmenorrhea among girls represents a significant public health problem.

Just prior to the onset of or a few days before menstruation, cramping pain in the lower abdomen typically begins, and it may continue for up to three days. In addition to the abdominal cramps, several symptoms, such as back pain, headache, dizziness, vomiting, nausea, or diarrhea, may accompany it [3]. The severity of the primary dysmenorrhea varies depending on degree of cramp pain, presence of symptoms, and impact on daily activities [3]. The severity of primary dysmenorrhea can increase depending on family history, smoking, earlier menarche age, long menstrual periods, and excessive menstrual flow.

The first-line treatment for dysmenorrhea is the use of nonsteroidal anti-inflammatory drugs (NSAIDs) [3,15]. NSAIDs relieved pain in approximately 70%–90% of patients when compared to those given a placebo [3]. A systematic review supports the use of NSAIDs as the first-line treatment for pain relief in dysmenorrhea [16]. The prescribed NSAIDs are effective in relieving menstrual pain [17,18]. The second-line treatment of dysmenorrhea is the use of oral contraceptive pills (OCPs). Women who use OCPs

* Corresponding author. Trakya University Medical Faculty, Department of Biostatistics, 22030 Edirne, Turkey.
E-mail address: necdetsut@yahoo.com (N. Sut).

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reported less pain than women not using them [5]. OCPS give moderate pain relief when compared to the placebo [3]. However, both NSAID and OCP treatment can produce some adverse effects.

Various alternative methods are used for the treatment of primary dysmenorrhea, and there are self-care approaches, such as heat therapy and exercise, to relieve its pain. Also, complementary or alternative medicine treatments such as acupuncture and aromatherapy have been used, but there is limited evidence to support their efficacy [3].

Aromatherapy treatment with essential oils to relieve pain in primary dysmenorrhea is the most widely used method in complementary practices. Essential oils can be applied with massage or during bathing, or they can be inhaled [1]. When aromatherapy treatment with essential oils is performed by abdominal massage, the oils are absorbed through the skin and penetrate the tissues [1,19]. Several independent studies investigated the treatment of primary dysmenorrhea to determine whether aromatherapy massage with essential oils for primary dysmenorrhea is effective or not. Therefore, in this meta-analysis, we aimed to investigate the effect that aromatherapy massage with essential oils has on pain in primary dysmenorrhea.

2. Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist was used in the preparation of this meta-analysis [20].

We searched randomized controlled clinical trials (RCTs) in various databases (Pubmed, ISI Web of Sciences, and Google Scholar) using the keywords found in Table 1. As a result, a total of 53 studies were found. Next, reference lists and bibliographies of these studies were manually searched to determine other potential studies, and as a result of this, six new studies were identified. Fifty-three studies were excluded for various reasons (33 duplications, one animal experiment, one review, one unpublished master thesis, four different methodologies, ten inappropriate main outcomes, one Persian duplication, and two non-randomized clinical trials). After excluding those studies, a total of six randomized controlled trials were included in the meta-analysis. The flow chart of the meta-analysis is shown in Fig. 1.

The change in the visual analogue scale (VAS) pain score from the first menstruation cycle to the second cycle at the first menstruation day was used as the primary outcome. Massage with essential oils was classified as the aromatherapy group and massage with placebo oils was classified as the placebo group.

A heterogeneity test was used to determine whether the effect size was significantly different from studies in the meta-analysis. Cochran's Q test statistic was used to test for the presence of heterogeneity; also, the I^2 test statistic, in which 0% shows no heterogeneity, <25% shows small heterogeneity, and higher values (>50%) show significant heterogeneity, was used to describe the proportion of heterogeneity. Random effects and fixed effects meta-analysis models were used according to the heterogeneity of the test results.

Standardized mean difference (Hedge's g test statistics) was used to show the common effect between the aromatherapy and the placebo groups, in the meta-analysis. This effect can be defined as the difference between two means divided by pooled standard deviation.

Meta-analysis was performed using the MedCalc Statistical Software version 16.8.4 (MedCalc Software bvba, Ostend, Belgium; http://www.medcalc.org; 2016).

3. Results

The main characteristics of the six studies [1,2,21–24] that were selected for meta-analysis are shown in Table 2. There were 184 primary dysmenorrhea patients in the aromatherapy group, and 178 in the placebo group. Of the six studies, one study was double blind and the researchers who were responsible for data collection were blind in two of the studies. The main outcome was a 10-point VAS scale in five studies; however, the 100-point VAS scale was used in one study, but converted to the 10-point VAS score in the meta-analysis. In all of the studies, abdominal massage was applied using several essential oils in the aromatherapy groups, and using non-essential oils (commonly almond oil) in the placebo groups. There was heterogeneity between the aromatherapy and placebo groups ($p < 0.001$; $I^2 = 79.7\%$, 95% Confidence Interval: 55.8%–90.6%).

Comparison of the aromatherapy and placebo groups in the meta-analysis, based on the change in the VAS pain score are shown in Table 3. According to the random effects meta-analysis, the standardized mean difference value of the aromatherapy versus the placebo group was calculated as −1.06 (95% CI: −1.55 to −0.55). Abdominal aromatherapy massage with essential oils significantly reduced the VAS score from the first menstruation cycle to the second cycle at the first menstruation day when compared to the massage with placebo oils (Fig. 2). Aromatherapy massage with only lavender oil was superior to the massage with placebo oil (standardized mean difference = −1.57 [95% CI: −1.97 to −1.17]) according to the fixed effect meta-analysis (p = 0.906; $I^2 = 0.0\%$; Fig. 3). Aromatherapy massage with lavender plus mixed oils was superior to the massage with placebo oils (standardized mean difference = −0.87 [95% CI: −1.64 to −0.10]) according to the random effect meta-analysis (p = 0.002; $I^2 = 83.0\%$, 95% CI: 48.8–94.4; Fig. 4).

4. Discussion

Menstrual pain is a common symptom of primary dysmenorrhea, and even though many women suffer from it, they do not seek professional help [1]. A recently published critical review showed

Table 1
Screening keywords for meta-analysis.

Title or abstract contains following keywords			PUBMED (n)	Web of Sciences (n)	Google Scholar (n)
Aromatherapy	and	dysmenorrhea	6	6	17
		primary dysmenorrhea	3	1	4
		premenstrual	1	0	1
		premenstrual syndrome	1	0	0
Aromatherapy massage	and	dysmenorrhea	3	2	3
		primary dysmenorrhea	2	1	2
		premenstrual	0	0	0
		premenstrual syndrome	0	0	0
		Total	16	10	27