

A Comparison of the Effects of Vitamin E and Vitamin B1 on the Severity and Duration of Pain in Primary Dysmenorrhea

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ABSTRACT

Background & aim: Primary dysmenorrhea is defined as painful menstruation in the absence of any confirmed pelvic disease. Its incidence has been estimated between 50-90% in different communities. Non-steroidal anti-inflammatory drugs (NSAIDs) and contraceptives are usually prescribed for the treatment of primary dysmenorrhea; however, they lead to several specific complications. Due to the importance of this issue, some studies have been performed on medications with fewer side effects. This study aimed to compare the therapeutic effects of vitamin E and vitamin B1 on pain severity and duration in primary dysmenorrhea.

Methods: This randomized clinical trial was conducted on 90 female students of Ferdowsi University of Mashhad, Iran, who met the inclusion criteria. At first, the participants, whose pain score of Visual Analogue Scale (VAS) was less than 40 during their three last menstrual cycles were excluded from the study; then, the rest of the participants were randomly assigned to two groups. The treatment was started by administrating vitamin B1 100mg/day for the first group (vitamin B1 group) and vitamin E 400unit/day for the second group (vitamin E group). Finally, the two groups were compared in terms of the severity and duration of pain in dysmenorrhea.

Results: As to the findings, the mean age of the participants was 22.97±3.23 years. There was a significant difference between the pre- and post-treatment periods in terms of pain severity ($P<0.001$ & $P=0.002$, respectively) and pain duration ($P=0.001$ & $P<0.001$, respectively) in both groups; however, no significant difference was observed between the two groups regarding the mean of pain severity and duration ($P=0.739$ & $P=0.102$, respectively).

Conclusion: It is recommended that vitamin E and vitamin B1 be used for the treatment of primary dysmenorrhea.

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Introduction

Primary dysmenorrhea is defined as painful menstruation in the absence of any confirmed pelvic disease. It is accompanied with several complications such as vomiting, fatigue, low-back pain, headache, diarrhea, and confusion (1). Its incidence has been estimated between 50-90% in different communities (2, 3).

Primary dysmenorrhea appears 1-2 years after the first menstrual period, and concurs with ovulation. It usually occurs in younger females, and decreases with advanced age (4).

Primary dysmenorrhea is associated with the increased production of endometrial prostaglandins, resulting in uterine contractions (2).

Considering the etiology of primary dysmenorrhea, its treatment should aim at decreasing uterine prostaglandins. There are different pharmacological treatments for primary dysmenorrhea, such as contraceptives and short-term nonsteroidal anti-inflammatory drugs (NSAIDs) (5). Although NSAIDs have been

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shown effective in 80-90% of cases, they are associated with several adverse side effects; therefore, they are contraindicated in many patients (6, 7).

Complementary and alternative medicine (CAM) has proposed new treatment approaches such as administration of vitamin E and vitamin B1 supplements. Vitamin B1 is the first identified vitamin B, which affects primary dysmenorrhea by decreasing the inflammatory stimuli (8, 9). Sekhavat et al. (2002) showed that taking vitamin B1 100mg/day in luteal phase in women might have similar effects as ibuprofen, though with fewer side effects; therefore, vitamin B1 could be used for dysmenorrhea treatment (9).

Vitamin E was discovered for the first time in 1992 during a research on the relationship between nutrition and fertility by Evans and Bishop. As it was revealed, this vitamin could inhibit arachidonic acid release and its conversion to prostaglandin. It could also increase internal opioids and pain relief (10). The current study aimed to compare the therapeutic effects of vitamin E and vitamin B1 on the severity and duration of pain in primary dysmenorrhea. These vitamins can be administered as an alternative for the complicated drugs, in case they are shown to be useful.

Materials and Methods

This single-blind randomized controlled trial was performed in the dormitories of Ferdowsi University of Mashhad, Iran, in 2012. The sample size was calculated as 90 students, considering the inclusion criteria. The inclusion criteria were as follows: 1) within the age range of 18-26 years, 2) being single, 3) regular menstruation, 4) no urogenital and coagulation disorders, and 5) no previous history of abdominal or pelvic surgery.

After sample selection and obtaining written informed consents, the participants were given a form about their menstrual cycle; they were provided with instructions on how to fill out the form. Visual Analog Scale (VAS) and Cox Menstrual Symptom Scale (CMSS) were used for grading. In order to assess pain severity, VAS was applied. In the provided form, 10cm (100mm) lines were drawn and graded

from 0 (no pain) to 100 (severe pain), and the participants were asked to mark their pain between 0-100 during the first, second, and third days of their cycle (before taking the supplements) on these lines.

Pain duration was measured from the onset of uterine cramps until they ended. CMSS was applied for the assessment of pain duration. Based on Cox regression, pain duration was categorized as follows: score 0: no pain; score 1: ≤ 0-5 hours of pain; score 2: 0.5-1 hours of pain; score 3: >1 hour of pain; score 4: >1 day of pain (10, 11).

The subjects were asked to record the longest duration of menstrual pain in the first three days of menstruation on special forms, based on CMSS score. The participants whose mean score of pain severity was less than 40 (based on VAS), were excluded from the study, and the rest were randomly assigned to two groups.

For starting the treatment course, the first group was prescribed vitamin B1 100 mg/day (since the 15th day of the menstrual cycle until the beginning of the next cycle), and the second group received vitamin E 400units/day (5 days in a month, from two days before the menstruation until the first three days). Each medication package was placed on a separate box, coded by letters A and B, and was given to each participant.

The subjects were separately treated. As soon as the treatment started, they were asked to record their most severe pain and its duration in the first three days, based on VAS and CMSS, respectively. The participants were also asked if they had taken any analgesics for their pain; if so, the name and dosage of the medication would be recorded in the treatment form.

The treatment course continued for three menstrual cycles, and then all the forms were collected. Finally, two groups of vitamin E and vitamin B1 were compared in terms of the mean of pain severity and duration before and after the intervention.

The reliability of VAS and CMSS was assessed using Cronbach's alpha coefficients; both scales were considered reliable (0.8 and 0.88, respectively). Data were analyzed by t-test, Mann-Whitney, and Kruskal-Wallis tests, using SPSS v16.

Table 1. Comparison of the mean of pain severity before and after the treatment, based on VAS

| Groups | Before the treatment (mm) | After the treatment (mm) | P-value |
|------------|---------------------------|--------------------------|---------|
| Vitamin E | 55.7742 | 45.1398 | 0.000 |
| Vitamin B1 | 48.6944 | 36.3413 | 0.001 |

Table 2. Comparison of the mean of pain duration before and after the treatment, based on CMSS

| Groups | Before the treatment (hour) | After the treatment (hour) | P-value |
|------------|-----------------------------|----------------------------|---------|
| Vitamin E | 1.9749 | 1.5878 | 0.002 |
| Vitamin B1 | 2.0119 | 1.4722 | 0.000 |

Table 3. Comparison of the mean of pain severity and duration between the groups.

| | Vitamin E | Vitamin B | P-value |
|----------------------------|-----------|-----------|---------|
| Mean of pain severity (mm) | 45.1398 | 36.3413 | 0.739 |
| Mean of pain duration (h) | 1.5878 | 1.4722 | 0.102 |

Results

The mean age of the participants was 22.97 ± 3.23 years. The mean of sleep duration at night and daily exercise was 7.12 hrs and 43.78 min, respectively. No significant difference was observed between the groups regarding the need for analgesics ($P=0.172$) and non-pharmacological methods of pain control ($P=0.309$). The severity of symptoms associated with menstrual pain was significantly less after the treatment in comparison with the period before the treatment ($P=0.046$ and $P=0.001$ in vitamin E and vitamin B1 groups, respectively).

However, no significant difference was found between the two groups regarding the reduction of the severity of the symptoms ($P=0.775$). There was no significant difference in terms of menstrual blood loss between the groups ($P=0.634$). However, a significant difference was found in terms of pain severity and duration between the pre- and post-treatment periods in both groups (Tables 1 & 2).

As the comparison indicates, no significant differences were found regarding pain severity and duration between the groups (Table 3).

Based on the analyses, although there was no significant difference between the two groups in terms of pain duration, vitamin B1 group experienced a shorter duration of menstrual pain.

Discussion

CAM therapeutic approaches (with few or no complications) are commonly applied for

dysmenorrhea treatment in conducted research in this field.

As to the finding, both vitamin E and vitamin B1 could decrease pain severity and pain duration of primary dysmenorrhea; therefore, it could be said that they are proper alternatives for NSAIDs and oral contraceptives, particularly for contraindicated patients. Safari et al. (2006) showed that vitamin E has a significant effect on dysmenorrhea, equal to mefenamic acid, which is a well-known medication for the treatment of dysmenorrhea; the results are similar to the findings of the present study.

The results of the study by Ziaei et al. (2005) showed that vitamin E not only could decrease dysmenorrhea severity, but also decreased the menstrual blood loss. The present study showed no significant difference in menstrual blood loss before and after the treatment in the two groups. Decreased blood loss due to taking vitamin E supplements is related to its anti-prostaglandin effect, which is responsible for pain reduction as well as blood loss in these patients (5).

Ziaei et al. (2001) compared the effects of vitamin E and vitamin B1 on primary dysmenorrhea treatment. They showed 82% and 51% recovery with vitamin B1 and E, respectively. However, in our study, there was no significant difference between the two groups in terms of pain severity (11).

In conclusion, vitamin E and vitamin B1 could be prescribed for dysmenorrhea treatment, since they lead to fewer complications, and patients are highly compliant with these supplements, in comparison with conventional medications such as mefenamic acid.

Conflict of Interest

No conflict of interest exists.

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