

## The effect of a set of submaximal aerobic exercise and ginger on pain duration in the college girls with primary dysmenorrhea

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### ABSTRACT

**Background and aims:** Due to the anti-inflammatory properties of the ginger plant, it has attracted researchers' attentions for treating menstrual problems. The aim of this study was to investigate the effect of a program which contains submaximal aerobic exercises and ginger on pain duration in the college girls with primary dysmenorrhea.

**Methods:** This quasi-experimental research was performed on 40 female students with primary dysmenorrhea (moderate, severe) who lived in the dormitory of Shahid Rajaei University with average height, weight, age and body mass index of  $164.47 \pm 4.66$  cm,  $56.95 \pm 6.81$  kg,  $21.40 \pm 1.42$  years and  $21.07 \pm 2.41$  kg/m<sup>2</sup>, respectively. The samples were randomly divided into 4 groups (n=10) including exercise, ginger, combined of both exercise and ginger, and control groups. The exercise group performed an eight-week submaximal aerobic exercise. The ginger group used capsules which contain 250 mg ginger, 4 times a day from the third day of bleeding, and both variables were applied for the combined group. The influence of ginger and exercise were evaluated on the duration of dysmenorrheal pain and the data analysis was performed by using one-way ANOVA and Tukey tests.

**Results:** After 8 weeks of ginger usage and sub maximal aerobic exercise, the duration of pain declined in the combined (P=0.001) and practice groups (P=0.04) compared to the control group.

**Conclusion:** Submaximal aerobic exercise along with ginger use is effective in reducing the pain of primary dysmenorrhea.

**Keywords:** Submaximal aerobic exercise, Ginger, Primary dysmenorrhea, College girls.

Original article

### INTRODUCTION

Primary dysmenorrhea or painful menstrual which occurs in the absence of any specific pelvic disease, is one of the most common complaints in gynecology and reduces the women's performance and causes 34-50% of educational and career absenteeism.<sup>1</sup> In primary dysmenorrhea, pain starts with or after some hours of menstruation and lasts for 12 to 72 hours. It is similar to accouchement pain along with pubic cramps. The prevalence of

dysmenorrhea varies in different studies and on the average is about 50%, but it has been reported from 74 to 90% in Iran.<sup>1,2,3</sup> Since 1970, prostaglandins have been identified as one of the main causes of primary dysmenorrhea,<sup>4,5</sup> Menstrual cramps, may be influenced by different factors like menstrual period characteristics, social status, type of delivery, nutrition, smoking, alcohol consumption, daily activity, psychological factors, the volume and the

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duration of bleeding as well as the age and marital status of the individuals.<sup>6</sup> In 30 years individuals, regular physical activity is considered as an effective treatment for the prevention and treatment of dysmenorrhea. On the other hand, among herbs, the ginger is prescribed for the treatment of dysmenorrhea in Iranian and some other communities' traditional medicine.<sup>1,2,3</sup> Given the high prevalence of dysmenorrhea pain and its inappropriate consequences effect on the quality of life and also due to the different results of conducted studies on the role of exercise in treatment of these disorders, it has proven that there are many side effects in most treatment methods. So, the trend for the complementary therapies and application of alternative medicinal plants has been increased.<sup>7,8</sup> The aim of this study was to determine the effect of submaximal aerobic training and ginger on the duration of pain of primary dysmenorrhea in college girls.

## METHODS

This quasi-experimental study was performed according to a pre-test and post-test plan among all female students in Shahid Rajaei University with moderate and severe dysmenorrhea. 250 students were selected by convenience sampling. After holding a briefing, a questionnaire was used which contained questions about menstruation and visual analog scale. 40 of those students with severe primary,<sup>8-10</sup> and medium dysmenorrhea,<sup>4-7</sup> with physical health and no history of sport activities, were recruited on a voluntary basis.<sup>9,10</sup> Average height, weight, age and body mass index were respectively  $164.47 \pm 4.66$  cm,  $56.95 \pm 6.81$  kg,  $21.40 \pm 1.42$  years and  $21.07 \pm 2.41$  kg/m<sup>2</sup>. The samples were randomly divided into 4 groups of 10: exercise, ginger, combined (exercise, ginger) and the control groups. Considering the fact that one of the conditions of acceptance was their

non-athletic subjects, Queen Steps performed in order to get homogeneous groups. The exercise group practiced submaximal aerobic exercises twice a week and 40 minutes every time. Exercise at 60-65% heart rate reserve was conducted under the supervision of a coach. Each practice session included a ten-minute warm up, 25 minutes doing as the main part of exercise which included mixed movements and aerobic exercises and a 5-minute cool down. For those of ginger group, capsules containing 250 mg of powdered ginger root (Zyntuma) was prescribed in the first 3 days of menstruation: 4 capsules a day (every 6 hours). For the combined group both variables were applied which were considered for exercise and ginger groups. To assess the effect of ginger, two groups including the ginger and mixed group consumed the ginger capsules simultaneously with the same amount of water. According to the obtained data, the effect of exercise and ginger was compared on the pain duration of primary dysmenorrhea was compared. The content validity and reliability of 91%,<sup>11</sup> and for homogeneity of variance, one-way ANOVA and Tukey test were used.

## RESULTS

Individual characteristics and menstrual status of the samples showed that the subjects in 4 groups were not significantly different based on age, weight, height, body mass index, oxygen consumption and the age at menarche bleeding duration. The abundance of severe and moderate primary dysmenorrhea before treatment was 36.6% and 63.3%, respectively.

Data analysis including one-way ANOVA test and Tukey test was used to analyze data which showed that the duration of pain, in exercise and combined group ( $P=0.04$ ,  $P=0.001$ ) significantly decreased compared to the control group (Table 1).

**Table 1:** A summary of the results of variance analysis related to the pain duration (h) in the pre-test and post-test phases

Group	Index	Test phases	M±SD	P-value
Pre-test		Exercise	15.60±6.09	992.0
		Ginger	15.90±8.67	
		Ginger + exercise	14.90±7.92	
		Control	16.00±11.11	
Post-test		Exercise	6.80±4.87	0.002*
		Ginger	10.70±7.67	
		Ginger + exercise	3.15±4.68	
		Control	16.10±10.48	

\* $P < 0.05$  is considered significant between exercise and combined group compared to the control group

## DISCUSSION

The results showed that there was a significant difference between the effect of submaximal aerobic exercise and ginger's usage on primary dysmenorrhea pain. Based on the statistical results, there was a significant difference between the exercise and mixed group compared with the control groups. This result may indicate that the main factor which affects the duration of pain was the exercise variable. Ginger played its role as a secondary factor beside the exercise. The results of several studies suggested that therapeutic exercise and physical activity is associated with reduced pain. Exercise causes to delay the start of prostaglandins gathering and to increase the rate of accumulation of waste from the body. It reduced the menstrual pain by increasing endorphins and reducing stress and sympathetic nervous activity, and also by increasing the blood flow to the pelvic.<sup>2,12</sup> Another hypothesis about the mechanism of dysmenorrhea refers to the increase in the production of prostaglandins in the endometrium. Laboratory studies suggest that ginger has some compounds that inhibit lipoxigenase and cyclooxygenase pathway and has effects on the arachidonic acid metabolism which is a precursor of prostaglandins production. Ginger has possibly anti-inflammatory and antioxidant

effects by inhibiting the production of prostaglandins and leukotriene, prostaglandins during menstruation period,<sup>1</sup> and acts as an auxiliary agent and motivating stimulus. The results of this study are in accordance with the results of studies conducted by Shahrjerdi and shavandi,<sup>2,13</sup> but counter current with those obtained by Daley and Blakey. These researchers have not found a link between the levels of physical activity and pain.<sup>8,14</sup> From the other possible reasons about the differences between the findings of this study and other researches, it can be referred to the exercise program, dose of ginger's usage and its participants.<sup>1,2</sup> Considering the high prevalence of dysmenorrhea and its negative impact on quality of life as well as due to the reluctance of people to heavy and prolonged exercise and the side effects of NSAIDS it can also precautionary prescribed the use of herbal ginger and submaximal aerobic exercise as an adjunct in the treatment of pain in this age group. It is also recommended a similar study on female athletes and adolescents aged adults perform and the results compare.

## CONCLUSION

Submaximal aerobic exercise along with ginger's usage, were effective in reducing the pain of primary dysmenorrhea.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

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