

The Effect of Exercise on Primary Dysmenorrhea

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Abstract

Background: Dysmenorrhea is a painful syndrome that accompanies the menstrual cycles. Although exercise is generally thought to alleviate the dysmenorrhea, the scientific literature display mixed evidence. The main objective of this research was to determine the effects of exercise on primary dysmenorrhea.

Methods: This study was a randomized clinical trial of 150 high school girl students in Masged Solayman city that suffering from severe dysmenorrhea. Students were separated in two "exercise "and "non exercise "groups. Then the "exercise "group was given some exercises and the results of the two periods after the exercise were registered. The descriptive statistics and repeated measure design were used for analyzing the statistical information.

Results: The results showed that the intensity of the pain in the exercise group declined from 8.59 to 4.63 in the third period and 2.84 in the fourth period ($P<0.01$). The average of the duration pain declined from 7.15 to 4.22 in the third period and 2.23 in the fourth period ($P<0.01$). The average of using sedative tablets also decreased from 1.13 to 0.35 tablets in the third period and 0.0 tablets in the fourth period ($P<0.01$).

Conclusion: The exercise can decrease the duration and severity of dysmenorrhea and also using of the sedative tablets in high school girls.

Keywords: *Dysmenorrhea, primary dysmenorrhea, high school girls, exercise*

Introduction

In primary dysmenorrhea, pain is spasmodic in character and felt mainly in the lower abdomen, but it may radiate to the back and along the thighs. There may be associated systemic symptoms like nausea, vomiting, diarrhea, headache, fatigue, and dizziness, and in severe cases, syncope (1, 2). The onset is usually 6 to 12 months after menarche, which coincides with the occurrence of regular ovulatory cycles. The prevalence in general population is from 47 to 80%, depending on the studied age group (3, 4). Seventy five to 85% of women have mild

dysmenorrheal (5). However, one study found that 51% of women had been absent from school or work at least once and 8% had been absent with every menstruation (6). Dysmenorrhea causes considerable personal and family disruption. Furthermore, dysmenorrhic girls have lower school marks and more school adjustment problems than do nondysmenorrhic ones counterpart (7).

Recent evidences suggest a definite physiologic basis for dysmenorrhea and links to increased levels of prostaglandins, which results in uterine contraction and ischemia (8, 9). Falling progesterone level during the luteal phase brings about these elevations, specifically of $PGF_{2\alpha}$ and PGE_2 . The role of prostaglandin

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synthesis inhibitors is in reducing painful symptoms accompanying menstrual discharge (10). It seems that women who exercise have a reduced incidence of dysmenorrhea. These may be due to exercise related hormonal effects on the lining of the uterus, or increased level of circulating endorphins. It seems that exercise acts as a nonspecific analgesic for short-term relief of pain (11, 12). However, a combination of organic, psychological, and sociocultural factors may be responsible. Thus, primary dysmenorrhea has varying degrees of intensity, remains difficult to measure and evaluate in a scientific investigation (13). Dysmenorrhea affects on school absenteeism and works as a public health problem of this age group. The aim of the current study was to examine the effect of exercise on primary dysmenorrhea in high school girls.

Materials and Methods

A sample of one hundred and fifty junior high school girls aged 15-18 years in Masjed Soleman city, Khozestan Province who suffer from primary dysmenorrhea were obtained at random from the population register.

Recruitment was from September to December 2002, and about 142 students interviewed agreed to participate. All samples that had regular menstruation and severe primary dysmenorrhea were divided at random in two groups (Exercise and control group). Both groups recorded the character of their menstruation at cycles 1 and 2: severity, duration of pain and duration of bleeding. With recording two cycles, a prior diagnosis of primary dysmenorrhea was made before beginning the evaluation.

In the present study a visual analogue scale measured the severity of pain. This technique involves the use of a 10 cm line on a sheet of paper and represents the continuum of the girls' opinion of the degree of pain. It was explained the one extremity of the line represented "unbearable pain" and the other extremity, "no

pain at all" the girls rated the degree of pain by making a mark on distance from zero to that mark (15). After observation on 2 cycles, exercise group were educated about four types of physical activities:

1- Lie face up with legs and knees bent perform abdominal breathing about 10 times.

2- Stand holding backs of chair; lift one heel off the floor, then the other, repeat 20 times.

3- Stand holding back of chair then does 5 deep knee bends.

4- While lying on back lift and bring knees to touch chin, 10 times. They should do these physical activities twice a day in 20 min and stop them in menstruation.

With telephone or refer to the high schools, we were confident that they do these physical activities. All two groups recorded the character of menstruation in cycle 3 and 4. After 2 cycles with physical activity in exercise group and observation in control group, data were analyzed with SPSS. Bivariate analyses with *t*. test were used to evaluate the association between two groups. Regression models were used to assess whether exercise was effective in decline the severity and duration of pain. Difference was statistically significant at the $P < 0.01$.

Results

Analysis statistical was focused on 142 cases (exercise= 97, control= 45). Two groups were matched about, severity of pain ($P = 0.721$), duration of pain ($P = 0.638$), duration of menstruation ($P = 0.542$). The mean age of two groups was 16.56 (SD: 1.12) years. The results of this study show that severity of pain (visual analogue scale) was lower ($P < 0.01$) in exercise group (Table 1). The mean severity of pain from cycle 3 after beginning exercise shows significant variation. The mean severity of pain was decreased in first group from 8.59 before exercise to 4.63 in cycle 3 and 2.84 in cycle 4. But this variation of pain in control group

was not significant. Other results show that in the end of fourth cycle, students reported their pain: 10% (n=10) no pain, 40% (n=39) mild, 44% (n= 43) moderate, 3%(n= 3) severe and 2% (n=2) very severe. All these five people were guided for other investigation and treatment. For showing decrease the severity of pain we used the simple linear regression model in 2 groups (Severity= 2.806+6.134, SE= 0.326). The result indicated that the mean of the duration pain decreases from 7.15 before exercise to 4.22 in the third period and 2.23 in the fourth period after exercise group ($P<0.01$) but not significant in control group (Table 2). On the other hand, for investigation the effect of exercise on duration of pain we used Kaplan-Miller figure. The Fig.1 shows that the survival pain in exercise group is less in controls. On the other hand the duration of pain in 60 % of exercises was 4 h while in control was 6 h in cycle 3. Fig. 2 displays this variation is survived pain between exercise and control group in cycle four. There was a significant correlation ($P<0.01$) between the severity of dysmenorrhea and the duration of menstruation flow. The severity of dysmenorrhea decreased with decreasing duration of menstruation. In this study, our results showed that the mean duration of bleeding in

exercise group decreased from 6.56 day (SD= 0.851) to 5.88 (SD= 0.60) in the fourth period. Fig. 3 shows these changes in duration of bleeding. There was a significant correlation ($P<0.01$) between the severity of dysmenorrhea and the duration of menstruation discharge. The severity of dysmenorrhea decreased with decreasing duration of menstruation.

Table 1: The severity of dysmenorrhea in the exercise and control groups during the fourth period

Group Severity Cycle	Exercise		Control	
	Mean	SD	Mean	SD
Mean Cycle 1, 2	8.59	1.21	8.84	0.893
Cycle 3	4.63	2.22	9	1.02
Cycle 4	2.84	2.18	9	1.02

Table 2: The variation of the duration of pain in the exercise and control groups during the cycles

Group Duration Cycle	Exercise		Control	
	Mean	± SD	Mean	± SD
Cycle 1, 2	7.15	1.41	6.60	1.44
Cycle 3	4.32	2.52	6.82	2.60
Cycle 4	2.23	1.93	6.87	2.56

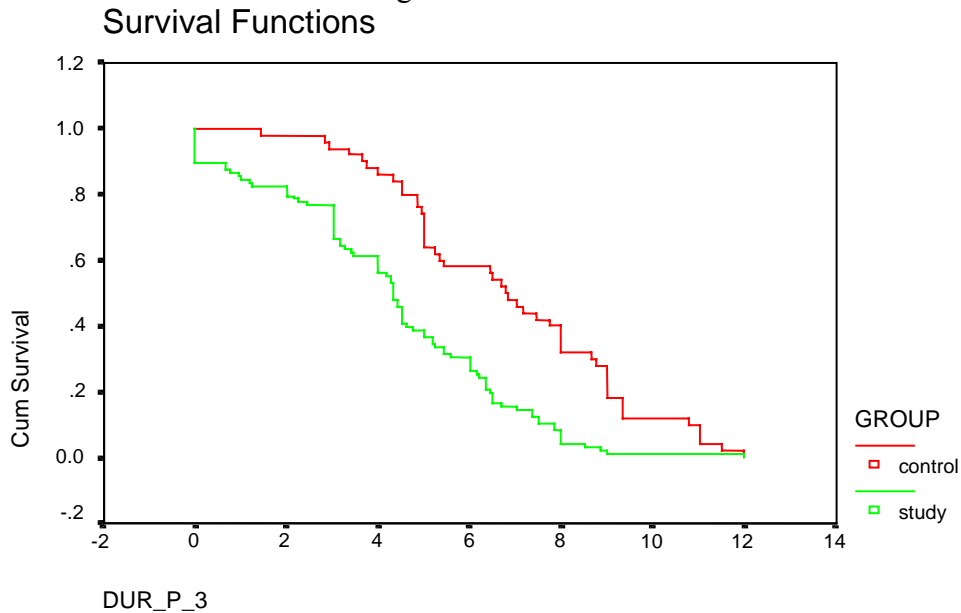


Fig.1: Comparison of persistent pain time in third period menstruation (hours)

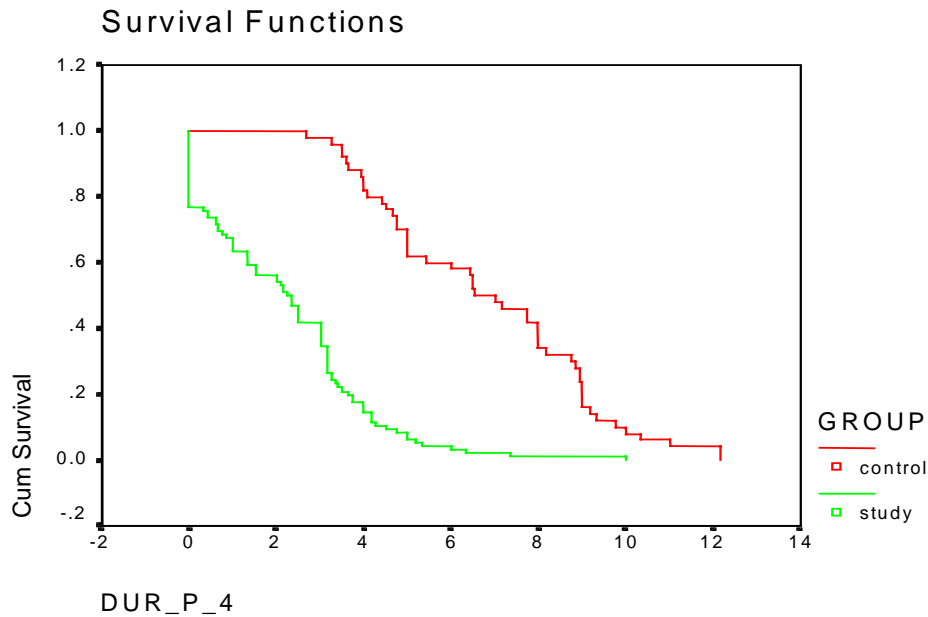


Fig. 2: Comparison of pain duration in third period of menstruation (hours)

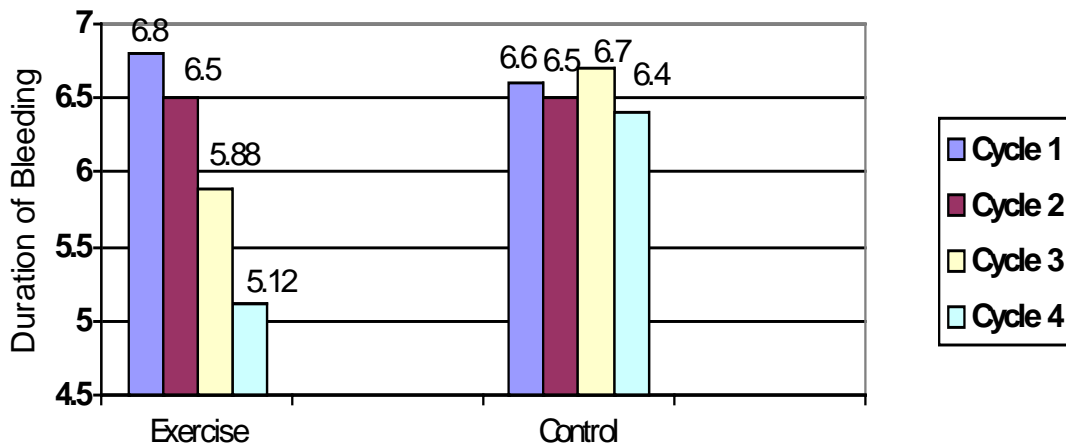


Fig. 3: Changes of bleeding in the exercise and control groups during the menstrual cycles

Discussion

For almost half a century, exercise has been thought that relief or even cures primary dysmenorrhea and in the last 15 to 20 years, researches for the link between physical activity and menstrual disorders have increased significantly. However, the scientific literature on the effect shows controversies (14, 15). Decline in the severity of symptoms after 12-week aerobic training program was shown (14). Another report showed diminished dysmenorrhea in junior

high school girls (7). Similarly, women who train regularly have been found to report fewer symptoms than women who exercise occasionally (16).

Golub et al (13) studied the effectiveness of the exercise on the frequency of premenstrual difficulties and dysmenorrhea among high school girls over a 3-year period, at the end of which, 39% of the exercise group suffered from dysmenorrhea compared with 61% of the control group ($P < 0.05$). The investigators, however, did

not differentiate between primary and secondary dysmenorrhea. Prior to enrollment, the subjects were also informed that special exercise was effective in preventing and relieving menstrual discomfort and it was important to perform that exercise daily.

Izzo and Labriola showed that dysmenorrhea was less prevalent in athletes who had begun their sports activities prior to menarche, and that there was improvement in symptoms after initiation of exercise, and athletes participating in more intense sports activities had less severe menstrual symptoms(16).

An interesting element of the relationship between exercise and dysmenorrhea is the involvement of stress. A number of studies have showed a correlation between life stress and gynecological with premenstrual syndrome (3). Exercise is widely accepted as a mean of moderating stress and biochemical changes in the immune system. A mechanism by which exercise may improve the symptoms of dysmenorrhea (reducing stress) has been articulated by Gannon (12). Menstrual pain probably stems from increased contraction of the uterine muscle, which is innervated by the sympathetic nervous system. Stress tends to enhance sympathetic activity, and may therefore increase menstrual pain by exacerbating uterine contraction. By relieving stress, exercise may decrease this sympathetic activity, thereby alleviating symptoms. In fact, exercise is known to cause the release of endorphins, substances produced by the brain that raise the pain threshold (14).

Izzo and Labriola (16) have suggested improved metabolism of blood flow at the pelvic level, which occurs during exercise, might influence dysmenorrhea. Our results showed that the severity of dysmenorrhea decreased with decreasing duration and amount of menstruation and duration pain. At the end, with attention to the positive effect of exercise on dysmenorrhea, as a significant problem for high school girls, that causes absence from school and work, we recommend regular exercise as a

helpful means in this age group. On the other hand we can do exercise in every place that do not need to any cost.

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References

1. Tan K, Wan L. A prevalence study of dysmenorrhea in female residents aged 15-54 y clement. *Ann Acad Med*. 1992; **21**: 323-27.
2. Wilson C, Emnand J, Mansfield C. The relationship of calculated percent body fat, sports participation, age and place of residence on menstrual patterns. *Adolesc Health Care J*. 1985; **5**: 248-53.
3. Metheny W, Smith R. The relationship among exercise, stress, and primary dysmenorrhea. *Behave J Med*.1989; **12**: 569-86.
4. Warren MP. *Sport Gynecology: Problems and care of the athletic female*. Cambridge, Blackwell Science; 1998:pp.113-65.
5. Sacala M. *Obstetric and gynecology*.2nd ed. Philadelphia, Lippincott Williams; 2000: pp. 85-92.
6. Knish. R. *Dysmenorrhea: A historical prospective, premenstrual syndrome and Dysmenorrhea*. Baltimore, Urban and schwarzenberg; 1985: pp. 79-85.
7. Greer A. *Text book of obstetric and gynecology*. 1st ed. Mosby, Edinburg. M. Sby; 2001: pp. 94-106.
8. Anonymous B. *Premenstrual syndrome and dysmenorrhea*. Baltimore: Urban and schwarzenbery; 1985: pp. 31-37.
9. Decherney A, Cammphell S. *Current review of obstetric and gynecology*. Philadelphia, current science. Ltd; 1995: pp.145-67.
10. Chan W, Dawood M, Fuchs F. Prostaglandins in primary dysmenorrhea: Comparison of prophylactic and no prophylactic treatment with ibuprofen and use of oral contraceptive. *Am J Med*. 1981; **70**: 535-41.
11. Bonen A, Keizer H. Athletic menstrual cycle irregularity endocrine response to exercise

- and training. *Physician Sports Med.* 1984; **12**: 78-93.
12. Ganon. L. The potential of exercise in the alleviation of menstrual disorders and menopausal symptom. *Women Health.* 1986; **14**(2): 105-7.
 13. Golub LM, Solidum. A, Warren M. Primary dysmenorrheal and physical activity. *Sport Exe Med.* 1998; **30**: 906-9.
 14. Israel R, Sutton M, O'Brien. K. Effects of aerobic training on primary dysmenorrhea in college females. *Am J Coll health.* 1986; **33**: 241-44.
 15. Dombrowski L. *Practical strategies in obstetric and gynecology.* 1st ed. philadelphia. sounders; 2000: pp.85-92.
 16. Izzo A, Labrila D. Dysmenorrhea and sports activity in adolescents. *Clin Exp obstet Gynecol.* 1991; **18**:109-116.