EFFECT OF VIBRATION AND HEAT COMBINATION ON PRIMARY DYSMENORRHEA

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Background: Primary dysmenorrhoea is a common, idiopathic, chronic pelvic pain syndrome, with unknown aetiology which about 50% of women with regular menstrual period suffer. This study was designed to determine the effect of vibration and heat on primary dysmenorrhea. 

Materials and Methods: In this clinical trial, 75 female students aged 18-22 years old were evaluated for two menstrual cycles. At the first cycle the participants received the routine pain-relief method (synthetic or herbal medicine and traditional remedies). At the second cycle for each participant combined vibration-heat device was applied for ten minutes during menstrual pain. The average of perceived leg pain, lumbar pain and abdominal pain scores at two cycles were determined. The data were analyzed based on Wilcoxon and T tests by using SPSS (v 16.0) for Windows. 

Results: The average of all perceived pain scores at two cycles were significantly different before pain relief and after both routine methods and using the device (p<0.001). Those were more significantly reduced after using the device in comparison of using routine methods (p<0.001). Conclusion: Since “vibration-heat” is an effective pain relief method, it can be used as a complementary alternative medicine in primary dysmenorrhea reduction. 

Keywords: Vibration; Heat; Dysmenorrhea; vibration. 

INTRODUCTION 
Primary dysmenorrhea is a common, idiopathic, chronic pelvic pain syndrome, with unknown aetiology. It is a frequently occurring condition affecting a large proportion of young women. The highest prevalence has been reported in adolescent women, where as many as 50–75% suffer from dysmenorrhea. Dysmenorrhea is one of the major factors that decreases young women’s quality of life and social activities specially if such symptoms as headache, fatigue, nausea, vomiting, diarrhea, irritation, shivering and muscle cramps are involved. About 15% of adolescent and young women describe their dysmenorrhea as severe, causing regular absenteeism from school and work. This monthly disability, which interferes with daily work several days each cycle, has been estimated to account for 600 million lost working hours and two billion dollars in lost productivity annually in the USA. Effective management of dysmenorrhea is beneficial for both the afflicted individual and society. Systematic reviews and randomised controlled trials have shown that non steroidal anti-inflammatory drugs and hormonal regulation through oral contraception are significantly more effective for pain relief than placebo and are often used for symptom control. However, some women may not always find them effective or acceptable. For example, owing to side effects in the case of non-steroidal anti-inflammatory drugs. Non-drug treatments, including alternative and physical Therapies such as topical heat, herbal medicine, thiamine, vitamin E, fish oil, vegetarian diet, low fat diet, acupuncture, acupressure and...
transcutaneous electrical nerve stimulation (TENS) are increasingly being used for dysmenorrhoea.21

In different studies the effect of TENS on primary dysmenorrhoea,22 the effect of vibration on chronic backache,23 and toothache were identified.24 Vibration, moderate or fast percussions and also deep pressure on painful spots are pain relievers in dysmenorrhoea.25 A research on self-treatment patterns of young girls for dysmenorrhoea management showed that they use heat to decrease their pain.26 Another research study on the effect of physical activity on dysmenorrhoea showed that dysmenorrhoea prevalence in the athletic group was 3.2% less than non-athletic group.27

The above mentioned problems of this disorder and calls for its treatment prompted the researcher and her colleagues to study the effect of vibration and heat combination on dysmenorrhoea among the students of Islamic Azad University, Gorgan Branch.

MATERIALS AND METHODS

Study design, setting and subjects: This is a clinical trial conducted between Jun 2009 and March 2010 in the girls’ dormitory of Islamic Azad University of Gorgan (a city located in the north of Iran). Seventy five 18-22 year-old girls with a mediocre dysmenorrhoea not having any cardiovascular disease, severe anemia, chronic headache, precedent pelvic surgery, secondary dysmenorrhoea and not being married were studied. The sampling was purposeful and voluntary.

Instruments

Demographic questionnaire, pain ruler and vibration-heat device were used. Demographic questionnaire consists of two-part: 1- demographic characteristics (age, field of study, menarch age, menstruation interval and the length of period) and 2- clinical characteristic of dysmenorrhoea (leg pain, lumbar pain, abdominal pain). Vibration-heat device vibrates with a frequency of 50 (Hz) and heats up to 38 degrees in Celsius for ten minutes. It is a portable, light weight (w=424gr) and a safe device and is used as a belt on the abdomen. Anti-dysmenorrhoea 08 device with registration no.58420 is from General Department for Registration of Companies and Industrial Ownership (General Department for Registration of Documents and Landed Properties).

Data collection

During dysmenorrhoea, participants were asked to express their pain severity on a scale of 0-10 on the pain ruler, with 0 meaning no pain and 10 meaning the most severe pain that an individual might experience.

Each individual was studied for two continuous menstrual periods. In both periods participants filled out the checklists. On the first period, no intervention was made by researchers and participants were asked to fill out the questionnaire according to the severity of pain before and after using routine methods for relief (synthetic medicine (Ibuprofen, Mefenamic Acid, Hyoscine), herbals such as oxtongue boile, solution of rock candy in hot water and homemade treatments such as heating, massaging and holding legs into belly). On the second period, they were asked to use vibration-heat device for ten minutes each time when the menstrual pain began and they were told to use the device at a maximum of three times for each pain. They were told to avoid using other pain-relief methods as long as possible but, if necessary, they could use other methods. In the latter case they had to mention the type, the quantity and the length of that method.

Participants were referred to a gynecologist for a pelvic ultrasonography to make sure that there was not some pathologic factor in uterus and ovaries (i.e. myoma, ovarian cyst).

The study was approved by the Islamic Azad University, Gorgan branch, Medical Sciences Research committee. The record number of study in clinical trial site of IRAN is as IRCT: 201102195866N1. Written informed consent was obtained from the participants before enrollment. All ethics were observed in this study following Helisinki Ethics.

Data analysis

Data were analyzed based on Wilcoxon and T tests using SPSS (v 16.0) for Windows. The confidence level was rated 95%.

RESULTS

Seventy five students were studied in two cycles, 43% of whom were 20 years old, 82% were Fars natives and 18% were Torkman natives. All of participants were single. The subjects mostly studied basic science, humanities and medical science respectively. Menarche age of 42% of them was 13 years old. Minimum interval between two periods was 21 days and maximum interval was 40 days. Forty five percent of them had a 28 day interval.

The shortest menstrual duration was 5 days and the longest was 9 days and 53% of participants had a 7 days menstrual duration.

The average of perceived pain score at two cycles was significantly different before using pain relief and after using both routine methods and the device (P<0.001). It was more significantly reduced after using the device in
A study on the effects of TENS as a treatment for primary dysmenorrhea among students of Medical Science University of Tehran showed that using TENS alone in the case group had a remarkable decrease in pain in 65% of participants in comparison with control group (24%) and there was considerable decrease in dysmenorrhea symptoms. Due to the results of that study, TENS is a safe, effective and nonopioid treatment of primary dysmenorrhea.19 Studying the effect of acupressure on Sanjinjiao spot and Ibuprofen on primary dysmenorrhea on students showed that the severity of the pain after treatment in the first and second month hadn't a significant difference, but the severity of pain before and after treatment by acupressure and Ibuprofen had a significant difference.28 In this study the average severity of leg pain, lumbar pain and abdominal pain during the first time before using routine treatments and the device was 5.34, while the average after using routine treatments decreased to 4.09 and after using device to 3.44. Studying the effect of physical activity on dysmenorrhea comparing 250 students of Tarbiat Mo'alem and 250 students of Physical Education showed that dysmenorrhea prevalence was more than 75% in each group. Dysmenorrhea prevalence in the physical education group was 2.4% less than Tarbiat Mo'alem group. Prevalence of dysmenorrhea in athletic group was 3.2% less than non-athletic group. Prevalence and severity of dysmenorrhea in athletic individuals significantly decreased.27 Study on backache reduction showed vibratory exercises in comparison with tensive exercises had a significant statistical relation to chronic backache relief.29 Studying the effect of heat with Acetaminophen showed when heat was used with Acetaminophen, pain was decreased for a longer time and topical heat would decrease dysmenorrheal.30 Data gathered in this study showed vibration with heat had results similar to physical exercise or other treatments such as using synthetic medicine, herbal medicine and that traditional remedies can be effective in decreasing dysmenorrhea. Results of this study showed vibration is a safe, non-invasive, non-drug way and also during this research no considerable side effects were observed or reported. Only a slight side effect, that is, a moderate topical redness of skin was observed in 8% of participants. In this study, also, on the phase using routine methods and on the second phase using the device, a significant decrease was observed, therefore, using the vibration-heat device was shown to be more effective in pain relieving in comparison with routine methods. A Study on the effect of topical pressure and vibration on muscular pain showed, when pressure is used with vibration, it would decrease the pain by 11%. Vibration can block the function of vast neurological fibers and sciatic nerve and relieve the pain.30-32 The effect of vibration on the pain reduction in the mentioned study confirms vibratory effect of the vibration device on pain reduction in our research.

**DISCUSSION**

A study on the effects of TENS as a treatment for primary dysmenorrhea among students of Medical Science University of Tehran showed that using TENS alone in the case group had a remarkable decrease in pain in 65% of participants in comparison with control group (24%) and there was considerable decrease in dysmenorrhea symptoms. Due to the results of that study, TENS is a safe, effective and nonopioid treatment of primary dysmenorrhea.19 Studying the effect of acupressure on Sanjinjiao spot and Ibuprofen on primary dysmenorrhea on students showed that the severity of the pain after treatment in the first and second month hadn't a significant difference, but the severity of pain before and after treatment by acupressure and Ibuprofen had a significant difference.28 In this study the average severity of leg pain, lumbar pain and abdominal pain during the first time before using routine treatments and the device was 5.34, while the average after using routine treatments decreased to 4.09 and after using device to 3.44. Studying the effect of physical activity on dysmenorrhea comparing 250 students of Tarbiat Mo'alem and 250 students of Physical Education showed that dysmenorrhea prevalence was more than 75% in each group. Dysmenorrhea prevalence in the physical education group was 2.4% less than Tarbiat Mo'alem group. Prevalence of dysmenorrhea in athletic group was 3.2% less than non-athletic group. Prevalence and severity of dysmenorrhea in athletic individuals significantly decreased.27 Study on backache reduction showed vibratory exercises in comparison with tensive exercises had a significant statistical relation to chronic backache relief.29 Studying the effect of heat with Acetaminophen showed when heat was used with Acetaminophen, pain was decreased for a longer time and topical heat would decrease dysmenorrheal.30 Data gathered in this study showed vibration with heat had results similar to physical exercise or other treatments such as using synthetic medicine, herbal medicine and that traditional remedies can be effective in decreasing dysmenorrhea. Results of this study showed vibration is a safe, non-invasive, non-drug way and also during this research no considerable side effects were observed or reported. Only a slight side effect, that is, a moderate topical redness of skin was observed in 8% of participants. In this study, also, on the phase using routine methods and on the second phase using the device, a significant decrease was observed, therefore, using the vibration-heat device was shown to be more effective in pain relieving in comparison with routine methods. A Study on the effect of topical pressure and vibration on muscular pain showed, when pressure is used with vibration, it would decrease the pain by 11%. Vibration can block the function of vast neurological fibers and sciatic nerve and relieve the pain.30-32 The effect of vibration on the pain reduction in the mentioned study confirms vibratory effect of the vibration device on pain reduction in our research.

**CONCLUSION**

Because this method is safe, it may be used with common medicines or as an alternative treatment for dysmenorrhea. Since this is the first study on the relationship between vibration-heat and dysmenorrhea, it is recommended in future
studies should be done on different nationality groups, other age classes and married individuals.

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