Original Article

The effect of acupressure at third liver point on the anxiety level in patients with primary dysmenorrhea

Mahboobeh Kafaei-Atrian[1], Neda Mirbagher-Ajorpaz[2], Malihe Sarvieh[3], Zohre Sadat[4], Mohammad Asghari-Jafarabadi[5], Mahnaz Solhi[6]

Abstract

Background: Primary dysmenorrhea may lead to severe anxiety and pain relief during menstruation may reduce the anxiety levels. This study was aimed to determine the effect of acupressure at third liver and placebo points on the anxiety level in patients with primary dysmenorrhea.

Materials and Methods: This clinical trial was conducted in parallel in the control and treatment groups for three menstrual periods at the dormitory of Kashan University of Medical Sciences between March and June 2012. Students with pain score equal to or greater than 4 were selected and divided into groups based on severity of pain using a randomized block design with the allocation ratio of 1:1. Acupressure was applied in two acupoints including third Liver point (Liv3) and placebo points. Spielberg (STAI) anxiety questionnaire was completed before and after intervention. Randomization, subjects, and data analyzer were blinded to the analysis. Chi-square tests, *t*-test, Mann–Whitney, paired sample *t*-test, and univariate analysis of variance were used for statistical analysis. *P* values <0.05 were considered statistically significant.

Results: Mean [standard deviation (SD)] values of apparent anxiety levels before and after intervention for liv3 were 45.100 (9.769) and 38.100 (10.608), respectively. For the control group, they were 41.200 (9.795) and 38.900(10.140), respectively. Difference was significant only in the intervention group ($P < 0.001$). Hidden anxiety did not show a significant change before and after intervention. There was no difference between groups in apparent or hidden anxiety after intervention.

Conclusions: Pressure on liv3 point reduces anxiety. As there are no previous studies on this topic, further studies with more samples are recommended.

Key words: Acupressure, anxiety, control, dysmenorrhea, liver, pain

Introduction

Depression and anxiety are associated with primary dysmenorrhea.[1] Anxiety causes disruption in daily activities of people with dysmenorrhea.[2] Acupressure and massage therapy are effective non-pharmacologic therapies and can be effective in reducing menstrual pain.[3,4] The body's vital energy, called Chi in Chinese medicine, moves in the body pathways known as meridians. Energy flow is balanced in the meridians. The increase or decrease of energy in each meridian can affect the health of specific organs.[5] There are many points in meridians that are used to apply acupressure in traditional Chinese medicine.[3] Acupressure relieves symptoms of dysmenorrhea,[3] such as pain, depression, anxiety,[6,7] and stress.[8,9] But in another study, no significant relationship was found between painful menstruation and anxiety.[10]

Liv3 is located on the liver meridian. One of the energy-consuming organs of the liver meridian is genitalia,[11] and acupressure on the LIV3 can treat dysmenorrhea.[12,13] Although no study has been conducted about any change in anxiety occurring after acupressure on liv3 point, anxiety is associated with pain and pain relief may lead to an anxiety reduction.[14] Some studies have reported that acupressure

[1]Department of Midwifery, Kashan University of Medical Sciences, Kashan, Iran, and PHD Candidate,School of Health (Campus), Iran University of Medical Sciences, Tehran, Iran, [2]Department of Nursing, Kashan University of Medical Sciences, Kashan, Iran, [3]Department of Midwifery, Kashan University of Medical Sciences, Kashan, Iran, [4]Trauma Nursing Research Centre, Kashan University of Medical Sciences, Kashan, Iran, [5]Road Traffic Injury Prevention Research Center, Associate Professor, Tabriz University of Medical Sciences, Tabriz, Iran, [6]Department of Health Services and Health Education, School of Health, Iran University of Medical Sciences, Tehran, Iran

Address for correspondence: Ms. Zohre Sadat, Nursing Midwifery Faculty, Kashan University of Medical Sciences, Kashan Ravand Avenue, Kashan, Iran.
E-mail: kafaei_m@kaums.ac.ir

Submitted: 12-Jan-14; Accepted: 07-Jul-15

Access this article online

Quick Response Code:

Website: www.ijnmrjournal.net

DOI: 10.4103/1735-9066.178233

can reduce dysmenorrhea[5,12] and the anxiety caused by dysmenorrhea.[14] But there are studies reporting that anxiety did not decrease on applying acupressure by the research unit[14] or the researcher.[8,15]

Considering that each meridian can affect the health of specific organs, the insufficient data about the effectiveness of acupressure at liv3 on dysmenorrhea, the lack of reports about its effectiveness on anxiety caused by dysmenorrhea, contradictory reports about the relationship between acupressure and anxiety caused by dysmenorrhea, the importance of applying acupressure by the research unit, and the simplicity and accessibility of acupressure, this study intends to determine the effect of acupressure at the liv3 point on anxiety level in patients with primary dysmenorrhea.

Materials and Methods

This study is a clinical trial. It has been approved by the ethics committee of Kashan University of Medical Sciences (KaUMS) with the number پ/29/5/1/3613 and registered in Iranian Registry of Clinical Trials (IRCT) with the number IRCT201201308869N1. The study was performed according to the design without making any changes.

The study was carried out in parallel in the control and treatment groups. Acupressure was performed on the treatment and placebo points. In the control group (group A), acupressure was given in placebo point that was located 2 cun above the distance between the third and fourth fingers (this point is not located on the path of meridians [Figure 1].[11] In treatment group (group B), acupressure was given on the liv3 point located 2 cun (width of three fingers)[12] above the distance between the first and second metatarsal bones. The study was performed at dormitory of KaUMS between March and June 2012 for three menstrual cycles. Inclusion criteria were self-reported, including living at dormitory; being single; having regular menstrual periods; pain starting with menstrual bleeding onset; duration of bleeding between 3 and 8 days and menstrual interval between 21 and 35 days; dysmenorrhea with pain intensity equal to or higher than 4 based on visual analog scale (VAS) for pain intensity; lack of anemia, high blood pressure, or known systemic or genital disease, and severe psychological stress in the past 6 months (students were asked whether or not they have had severe emotional stress such as the death of relatives, surgeries, marriage, or divorce of parents in the past 6 months). Exclusion criteria were self-reported, including use of heat for pain relief; use of oral contraceptives, non-steroidal anti-inflammatory drugs, analgesics, or prostaglandin synthesis inhibitors from 4 h before to 4 h after acupressure; and not cooperating until the end of the third period of the menstrual cycle. Sample size was estimated as 27 students per group based on a pilot study. Considering 80% power and 95% confidence level, inclusion and exclusion criteria, and the possible loss of samples, public invitation was extended to 500 dormitory living students.

Block randomization was done with 1:1 allocation ratio based on pain intensity. This division was performed using a random number determined by the statistician.

Blinding

Subjects, randomization and analysis were blind to avoid any bias.

At first, the researcher learned the technique of acupressure from a traditional Chinese medicine professor and applied it on the subjects. The third author of this article who carried out sampling was an undergraduate midwife. She was in constant contact with the students face to face, by telephone, or via post. Students completed a questionnaire including demographic and menstrual cycle questions. Also, Spielberg (STAI) anxiety questionnaire was completed by the students before and after intervention.[16] On the first day of the first cycle, pain intensity was measured without intervention at the start of bleeding and after 0.5, 1, 2, 3, and 4 h. Dysmenorrhea was assessed according to VAS for pain intensity. Subjects with pain score equal to or greater than 4 were selected. At this time, 67 remaining students were randomly divided into two groups. Students were taught to find the exact location of acupoints and to apply acupressure technique. At first, acupressure was applied by the researcher in a clockwise rotation. Pressure was continued until the students reported De chi (feeling the symptoms of heat, cold, or tingling). Then the same pressure was applied on the acuhealth device. Students were asked to apply the same pressure and pay attention to their nail color change.

In the second and third cycles, students applied pressure by themselves at the bleeding onset. It was stopped with feeling De chi; otherwise, it was continued for 2 min and resumed on the other foot after a 2 min rest. Pressure was applied twice on each leg and a total of four times (16 min) in clockwise rotation. Pain was measured at the start of bleeding and after 0.5, 1, 2, 3, and 4 h. After the third menstrual cycle, anxiety questionnaire was completed by the participants for the second time.

Dysmenorrhea, acupressure, and objectives of the study were explained to the participants. Students were informed that they might be placed in control or intervention groups and they could discontinue cooperating in the study at any time they wanted. Informed consent was taken from them.

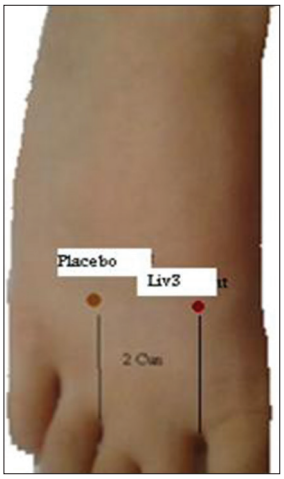

Figure 1: Liv3 and placebo points

We used a digital glass scale (GS46) with 100 g accuracy that was made in Germany for measuring the weight and a single non-elastic tape for measuring the height. Pressure exerted by the fingers of the researcher and the student was determined by a Force Gauge Device. Australian Acuhealth professional 900 was used. This valid and reliable device can specify the accuracy of the found acupoint.[5] It makes certain alarm at the exact location of the acupoint.

VAS pain scale is a ruler used by the research units to rate their pain. Distance between the beginning of the ruler to the marked point will be the numerical pain score of the unit.[17] The validity of this scale has previously been confirmed.[14] Spielberg anxiety questionnaire has 40 questions in two areas; each area has 20 questions. Each question has four options and a rating between 1 and 4. In apparent anxiety, a score of 4 indicates too high, 3 means high, 2 indicates low, and 1 means very low. In hidden anxiety, a score of 4 means almost always, 3 means often, 2 indicates almost never, and 1 means never. Thus, the total score would be 40–160. Anxiety score from 40 up to 80 is considered as low, 81–120 as moderate, and 121–160 as high. Reliability and validity of this questionnaire have been assessed and confirmed in Iranian society.[17] Additionally the internal consistency reliability of the measure has been supported in this study achieving an alpha value of .85. In this questionnaire, some phrases indicate absence of distress and are weighted inversely, including 1, 2, 5, 8, 10, 11, 15, 16, 19, 20 for apparent anxiety and 21, 23, 26, 27, 30, 33, 34, 36 39 for hidden anxiety.

Data were analyzed using SPSS software. Confounding variables were matched between groups, including painful menstrual history in first-degree relatives, age at menarche, interval between menarche and onset of dysmenorrhea, menstrual duration, and body mass index (BMI). Results were reported as mean [Standard Deviation (SD)] or frequency (%) for qualitative variables and mean (min.–max.) for quantitative variables. To check the consistency of underlying variables, *t*-test or Chi-square test was used according to the nature of variables. Mann–Whitney was used to compare the pain intensity between groups in the first cycle. To compare the anxiety scores between groups in the first cycle, *t*-test was used. To compare the anxiety scores before and after intervention, paired sample *t*-test was used. Also, in the third cycle, univariate analysis of variance with adjustment of the baseline values in the first cycle was used to compare the anxiety scores between groups. *P* values <0.05 were considered statistically significant.

Results

In the liv3 group, 33 students and in the control group, 34 students were enrolled and included in the study. Of these, 11 students in the liv3 group and 20 students in the control group were kept for analysis because of the possibility of losing the samples. Loss of samples is shown in Figure 2.

The mean (SD) for age, BMI, menarche, bleeding duration, menstrual intervals, family history of dysmenorrhea, pain intensity, use of painkillers, heat, and massage did not have a significant difference between groups. Also, anxiety level in the first cycle had no difference between groups. Mean (SD) values for apparent anxiety in the control and liv3 groups are shown in Table 1. This table indicates that acupressure on liv3 point caused decrease in apparent anxiety ($P < 0.05$). But this difference was not found in the control group. Moreover, there was no significant difference for hidden anxiety in any of the groups. Univariate analysis of variance did not show a significant difference for apparent ($P = 0.337$) and hidden anxiety ($P = 0.438$) between groups, when adjustment for baseline values in the first cycle was done.

Discussion

This study was done to determine the effect of acupressure at liv3 and placebo points on the anxiety level in patients with primary dysmenorrhea.

In this study, acupressure on liv3 acupoint reduced the apparent anxiety level. This is the first report of the relationship between anxiety reduction and acupressure on liv3 acupoint. We did not find any study that evaluated the effect of acupressure at liv3 on anxiety. But our previous report[13] and Bazarganipour *et al*.'s study[12] showed decrease in dysmenorrhea after acupressure was performed on this point. There are also some reports of reduction in dysmenorrhea on applying acupressure on SP6 acupoint.[3] Since pain is associated with anxiety, pain relief can decrease anxiety,[14] and this issue can confirm our result. Chen *et al*. (2004) studied the effect of acupressure at

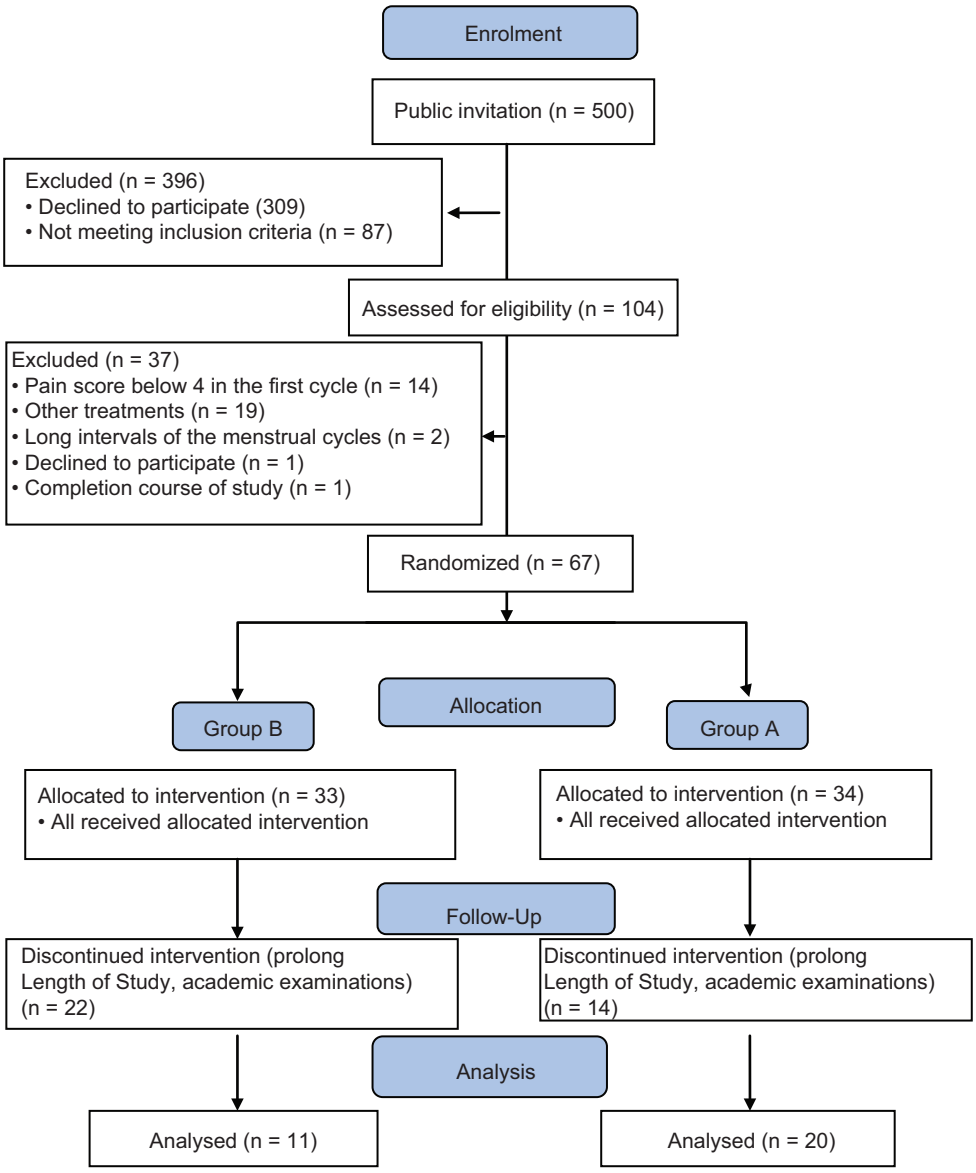

Figure 2: Flowchart

SP6 point on the level of anxiety. They showed a decrease in anxiety after acupressure; but they used VAS anxiety and studied persons with a pain score of 5 or more according to VAS pain intensity,[14] whereas we assessed anxiety with Spielberg questionnaire and studied students with a pain score of 4 or more according to VAS pain intensity.

Similarity of our study with Chen *et al.*'s study is that the pressure was applied by the research units. In their study, acupressure on SP6 was firstly done by a researcher, which caused decrease in dysmenorrhea and anxiety. But when acupressure was done by the research units, it just caused decrease in dysmenorrhea and not anxiety.[8] Lee *et al.* (2003) reported that acupressure on the SP6 point can reduce anxiety during labor without having adverse effects on the mother and baby.[18,19] Also, in the study of Charandabi (2011), reduction of menstrual symptoms severity scores after treatment was significantly more in the intervention group (acupressure on SP6 acupoint) as compared with the control group.[3]

Table 1: Comparison of different aspects of anxiety in groups between the first and third menstrual cycles

Aspects of anxiety	Group	Cycle 3		Cycle 1		*P**
		Mean	SD	Mean	SD	
Apparent	A	38.900	10.140	41.200	9.795	0.322
	B	38.100	10.608	45.100	9.769	<0.001
Hidden	A	40.450	8.300	41.900	8.607	0.502
	B	39.181	10.879	43.454	10.773	0.182

Group A=control; group B=intervention. *Paired samples *t*-test

In contrast, other studies have not confirmed this effect. The study of Mehling *et al*. (2012) did not show any decrease in anxiety on applying acupressure on the SP6 point.[15] It may

be due to applying pressure on more than one acupoint resulting in decrease in duration of pressure on each point.

Hidden anxiety did not decrease after applying acupressure on the liv3 acupoint. Generally, hidden anxiety shows ordinary feeling and specific conditions do not affect it. But Mirbagher *et al*. showed decrease in hidden anxiety on applying pressure on p6 point.[17]

In this study, acupressure on the placebo point was not effective on the anxiety level. Although some studies reported the effectiveness of acupressure on the placebo point, this effect was more in the intervention group.[6] Chen *et al*.'s (2004) study confirms our study. In their study, the intervention group received 20 min of pressure on SP6 point and the control group had 20 min break; reduction of anxiety was not seen in the control group. But the control group in our study received the same acupressure in the placebo point. Another important point to be noted in our study is that the researcher was not present when the pressure was applied, whereas the presence of a researcher along with the patient can reduce the anxiety level.

Conclusion

This is the first report that has shown reduction of anxiety associated with dysmenorrhea after applying acupressure on the liv3 acupoint. Also, successful self-treatment by the participants indicates that this approach can help women to reduce their anxiety without seeking any help from someone else. Further studies with a larger number of samples are recommended.

Acknowledgments

This article is taken from the project No. 9078 at KaUMS. Therefore, our thanks go to KaUMS for funding this research. We would also like to thank and appreciate all participants for their contribution in this study.

References

1. French L. Dysmenorrhea. Am Fam Physician 2005;71:285-91.
2. Rodrigues AC, Gala S, Neves Â, Pinto C, Meirelles C, Frutuoso C, *et al*. Dysmenorrhea in adolescents and young adults: Prevalence, related factors and limitations in daily living. Acta Med Port 2011;24(Suppl 2):383-92.
3. Charandabi SM, Nashtaei MS, Kamali S, Majlesi R. The effect of acupressure at the Sanyinjiao point (SP6) on primary dysmenorrhea in students resident in dormitories of Tabriz. Iran J Nurs Midwifery Res 2011;16:309-17.
4. Valiani M, Ghasemi N, Bahadoran P, Heshmat R. The effects of massage therapy on dysmenorrhea caused by Endometriosis. Iran J Nurs Midwifery Res 2010;15:167-71.
5. Bazarganipour F, Lamyian M, Ahmari Tehran H, Heshmat R, Asghari Jaafar Abadi M. Evaluation of the effect of liv3 acupressure on severity and duration of primary dysmenorrhea. Knowledge and Health 2010;5:27-35.
6. Kashefi F, Khajehei M, Ashraf A, Jafari P. The efficacy of acupressure at the sanyinjiao point in the improvement of women's general health. J Altern Complement Med 2011;17:1141-7.
7. Kober A, Scheck T, Schubert B, Strasser H, Gustorff B, Bertalanffy P, *et al*. Auricular Acupressure as a treatment for Anxiety in prehospital transport settings. Anesthesiology 2003;98:1328-32.
8. Chen HM, Chen CH. Effects of Acupressure on menstrual distress in adolescent girls: A comparison between Hegu-Sanyinjiao matched points and Hegu, Zusanli single point. J Clin Nurs 2010;19:998-1007.
9. Wong CL, Lai KY, Tse HM. Effects of SP6 acupressure on pain and menstrual distress in young women with dysmenorrhea. Complement Ther Clin Pract 2010;16:64-9.
10. Kordi M, Mohamadirizi S, Shakeri MT. The Relationship between occupational stress and dysmenorrhea in midwives employed at public and private hospitals and health care centers in Iran (Mashhad) in the years 2010 and 2011. Iran J Nurs Midwifery Res 2013;18:316-22.
11. Bazarganipour F, Lamyian M, Heshmat R. The effect of applying pressure to the third liver point on the symptoms of involved liver channel in girls with primary dysmenorrhea: A randomized clinical trial. Arak Medical University Journal 2010;13:17-25.
12. Bazarganipour F, Lamyian M, Heshmat R, Abadi MA, Taghavi A. A randomized clinical trial of the efficacy of applying a simple acupressure protocol to the Taichong point in relieving dysmenorrhea. Int J Gynaecol Obstet 2010;111:105-9.
13. Kafaei Atrian M, Abbaszadeh F, Sarvieh M, Sarafraz N, Asghari Jafarabadi M. Investigation the effect of pressure at Third Liver point on primary dysmenorrhea: A randomized controlled clinical trial. Iran Red Crescent Med J 2013;15:848-53.
14. Chen HM, Chen CH. Effects of acupressure at the Sanyinjiao point on primary dysmenorrhoea. J Adv Nurs 2004;48:380-7.
15. Mehling WE, Lown EA, Dvorak CC, Cowan MJ, Horn BN, Dunn EA, *et al*. Hematopoietic cell transplant and use of massage for improved symptom management: Results from a pilot randomized control trial. Evid Based Complement Alternat Med 2012;2012:450150.
16. Kitamura M, Takeda T, Koga S, Nagase S, Yaegashi N. Relationship between premenstrual symptoms and dysmenorrhea in Japanese high school students. Arch Womens Ment Health 2012;15:131-3.
17. Mirbagher N, Kafaei M, Shahshahani M, Mosahebi S, Khaleghi M. The usefullness of acupressure on the P6point in decreasing anxiety of the surgical technology-students. Complementary Medicine Journal of Faculty of Nursing and Midwifery Arak University of Medical Sciences 2013;3:462-70.
18. Lee MK. Effects of San-Yin-Jiao (SP6) acupressure on anxiety, pulse and neonatal status in women during labor. Korean J Women Health Nurs 2003;9:138-51.
19. Lee MK, Lee HS, Kim HS. Effects of treatment with San-Yin-Jian (SP-6) acupressure for labor women on labor pain, length time for delivery and anxiety: A clinical trial pilot study. Korean J Women Health Nurs 2002;8:559-69.

How to cite: Kafaei-Atrian M, Mirbagher-Ajorpaz N, Sarvieh M, Sadat Z, Asghari-Jafarabadi M, Solhi M. The effect of acupressure at third liver point on the anxiety level in patients with primary dysmenorrhea. Iranian J Nursing Midwifery Res 2016;21:142-6.

Source of Support: Kashan University of Medical Sciences, Project number: 9078, **Conflict of Interest:** The authors have no conflicts of interest.