

The Effect of the Kinesio Taping and Spiral Taping on Menstrual Pain and Premenstrual Syndrome

Chaegil Lim, PT¹⁾, Yongnam Park, PT²⁾, Youngsook Bae, PT^{1)*}

¹⁾ Department of Physical Therapy, Gachon University: Yeonsu 3-dong, Yeonsu-gu, Incheon city, Korea. TEL: +82 32-820-4324

²⁾ Hu Nae Ri Therapeutic Education Center

Abstract. [Purpose] The purpose of this study was to compare the effects of Kinesio taping and spiral taping on menstrual pain and premenstrual syndrome, to investigate the efficacy of the two types of taping as methods for alleviating menstrual pain and premenstrual syndrome. [Subjects and Methods] The subjects of this study were 34 unmarried women. The subjects were randomly divided into a Kinesio taping group, a spiral taping group and a control group. Subjects with a regular menstrual cycle underwent taping a total of six times; twice a week for about three weeks, starting from 14 days before menstruation and continuing until its end. Degrees of menstrual pain and premenstrual syndrome were measured before the application of taping. [Results] The results revealed that Kinesio taping had significant effects on menstrual pain, while spiral taping was effective at alleviating both menstrual pain and premenstrual syndrome. [Conclusion] Both taping methods before menstruation brought significant relief to menstrual pain, which suggests that spiral taping is an effective method of alleviating premenstrual symptoms.

Key words: Kinesio taping, Spiral taping, Menstrual pain

(This article was submitted Jan. 15, 2013, and was accepted Feb. 22, 2013)

INTRODUCTION

All human beings will experience pain (poena) some-time in their life, but if there is one pain that is particularly hard on women, it is menstrual pain. Although the term pain usually involves sensory emotional universality, and distinctiveness, menstrual pain is a pain unique to wom-en. About 50–90% of women experience menstrual pain¹⁾, and the pain can be so severe that it is cited as one of the most common reasons for social problems such as regular absence from school or work. Despite ongoing medical advances, many women still depend on medication to cope with menstrual pain, which may result in drug abuse²⁾.

Research conducted on menstrual pain shows that a high percentage of women, 60 to 93%, experience men-strual pain and that 42% of them suffer from a severe level of pain^{3, 4)}. Menstrual pain is known to involve symptoms such as backache, nausea, vomiting, diarrhea, headache, fatigue, nervousness, and dizziness⁵⁾, and a collection of such symptoms is called premenstrual syndrome, which involves complex emotional and physical changes that begin one or two weeks before menstruation⁶⁾.

Premenstrual symptoms include at least one of the first four symptoms: 1) a depressed mood; 2) tension or anxiety; 3) lower back pain; 4) decreased activity; 5) changes in appetite; and 6) physical symptoms (breast tenderness, headaches, bloating, and muscle pain). Therefore, premenstrual symptoms are a frequent source of concern for

*To whom correspondence should be addressed.

E-mail: mecca87@hanmail.net

women during their reproductive lives and moderate to severe symptoms impact on their quality of life⁷⁾. To deal with menstrual pain and premenstrual syndrome, many therapies, including medication and thermotherapy, which are types of conservative therapy, and other self-treatment methods have been prescribed to alleviate symptoms. For example, several medical therapies, herbal remedies⁸⁾, and acupuncture⁹⁾ have been reported to relieve menstrual pain. However, some therapies can have harmful consequences, such as tolerance to analgesics, as a result of abuse, and pain from and fear of acupuncture. Thus, methods of managing menstrual pain and premenstrual syndrome easily and conveniently, rather than the use of medication or irritating therapies would help reduce individual and social costs. One treatment possibility is taping therapy. Taping therapy eases pain by contracting relevant muscles or improving blood circulation through tape attached to the skin. Kinesio taping is a technique which is based on the body's own natural healing process and is used for anything from headaches to foot problems and everything in between¹⁰⁾.

The purpose of this study was to compare the effects of Kinesio taping and spiral taping, that are being clinically applied for menstrual pain and premenstrual syndrome, to investigate the efficacy of the two types of taping as methods for alleviating menstrual pain and premenstrual syndrome.

SUBJECTS AND METHODS

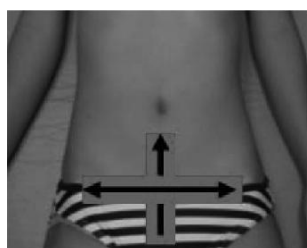
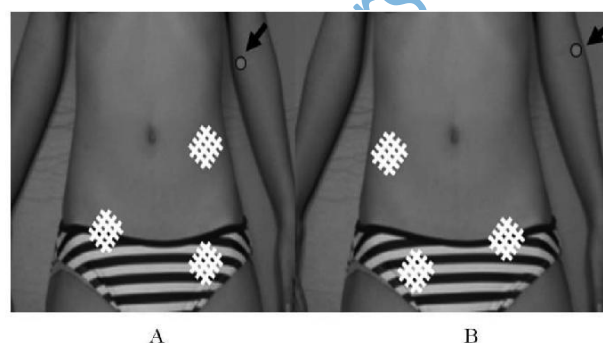
Subjects

The subjects of this study were 42 unmarried, non-

Школа кинезиотейпирования "KinesioCourse"

Table 1. Characteristics of subjects

	Kinesio taping (n=11)	Spiral taping (n=10)	Control group (n=13)
Age (year)	22.6±1.5	23.6±2.9	21.9±0.8
Weight (kg)	53.7±4.9	56.2±2.9	53.0±2.7
Height (cm)	160.2±5.0	161.3±6.1	161.0±6.5
Menarcheal age (year)	11.4±2.2	12.2±1.4	11.2±3.8
Menstrual Duration (day)	4.8±1.9	5.3±0.9	5.1±1.1
Menstrual interval (day)	28.2±4.0	27.9±3.7	29.8±8.6

**Fig. 1.** Kinesio taping method**Fig. 2.** Spiral taping method. A: the tender points on the biceps brachii tendon on the medial side, B: the subjects' tender points on the biceps brachii tendon on the lateral side

parous women in their twenties and thirties without pathologic findings in the pelvic cavity, whose menstrual pain scores were five or higher on a visual analogue scale (VAS).

The subjects were randomly divided into a Kinesio taping group, for which Kinesio tape was applied to the abdominal and lumbar areas of the subjects, a spiral taping group, and a control group. Of the initial 42 subjects, 34 were after excluding eight, whose menstrual due date did not correspond with the time of research or who did not fully engage in the program (Table 1). After menstruation ended, degrees of menstrual pain and premenstrual syndrome were measured again.

Methods

The subjects' menstrual cycles were first checked and then degrees of menstrual pain and premenstrual syndrome were assessed before the application of taping. Subjects with a regular menstrual cycle underwent taping a total of six times twice a week for about three weeks starting from 14 days before menstruation until its end. For the Kinesio taping group, a piece of Kinesio tape (Kinesio Taping Co., Ltd. Japan), 5 cm in width and 7–8 cm in length was applied right from below the navel and reached to where the pubic hair began, and another piece of tape 10 cm in length was applied to make a cross shape with the first piece (Fig. 1).

For the spiral taping group, based on balance taping points suggested by Tanaka, spiral tape (ExcelSpiral tape A type: Spiraltape of Tanaka. Japan) was applied to the subjects in a left-oriented direction in consideration of the research results that 95–99% of the entire population has left-oriented directivity, while 1–5% has right-oriented directivity. Taking into account the various patterns of menstrual pain, spiral tape was applied to the lower abdomen, the chief complaint area, in order to see if it had any effect on pain alleviation. An examination was carried out to

determine the subjects' tender points on the biceps brachii tendon of the left arm on the lateral or internal side based on the taping application area. Taping was applied to the subjects with tenderness on the lateral side as shown in Fig. 2, while it was applied to the subjects with tenderness on the internal side in the manner shown in Fig. 2¹¹⁾.

Kinesio tape is directly attached to the site of pain, whereas spiral tape is attached where it is determined that the balance of an antigravity muscle is broken¹¹⁾. Therefore, the tender points of the interior and exterior muscles of the biceps brachii, which is a major antigravity muscle, were examined, and the balance between the left and right sides of the pelvis was checked before tape that could balance the left and right functional adjustment of the pelvis was attached.

Degrees of menstrual pain were assessed using a VAS, which is a method of representing subjects' pain on a 10 cm linear scale. In this study, a score of 0 meant 'a very low degree of pain' and 10 meant 'a very high degree of pain.' To measure premenstrual syndrome, the subjects' decreased activity, lower back pain, tension or anxiety, breast tenderness, and headaches were assessed using the Menstrual Distress Questionnaire (MDQ)⁷⁾. Each item is scored on a 5-point Likert scale, with 1 being 'no pain at all,' followed by 'mild pain,' 'moderate pain,' 'slightly severe pain,' and 'extremely severe pain.'

Statistical analyses were performed using SPSS version 14 for Window (SPSS Institute Korea, Seoul, Korea) and values presented as Mean±SD. The mean and standard deviation of the subjects' height, age, and weight were cal-

culated using descriptive statistics. In order to analyze the changes in menstrual pain and premenstrual syndrome between the pre- and post-intervention, the Mann-Whitney test was used to test the significance of the changes within each group, and ANOVA was used the three groups. More-over, multiple comparison analyses of the three groups were made using the Least- Significant-Difference (LSD) test. In all analysis, statistical significance was accepted for values of $p < 0.05$.

RESULTS

The characteristics of the 34 participants in this study are shown Table 1. Menstrual pain significantly decreased in both the Kinesio taping group ($p < 0.01$) and the spiral taping group ($p < 0.05$). In terms of premenstrual syndrome, the Kinesio taping group did not show changes; however, the spiral taping group showed significant changes in breast tenderness, tension of anxiety, and decreased activity ($p < 0.05$). According to the results of the comparison among the three groups, the Kinesio taping group showed significant differences in menstrual pain from the other two groups ($p < 0.05$). No significant differences were found in premenstrual syndrome among the three groups (Table 2).

As such, the results reveal that Kinesio taping had significant effects on menstrual pain, while spiral taping was effective at alleviating both menstrual pain and accompanying premenstrual syndrome.

DISCUSSION

This study was conducted to examine the effects of Kinesio and spiral taping on menstrual pain and premenstrual syndrome in 34 unmarried, non-parous women in their twenties and thirties without pathologic findings in the pel-vic cavity.

Between 20 and 90% of female adolescents experience menstrual pain, and 15% experience severe pain¹²⁾, which can be serious enough to disrupt their daily lives. This study also ascertained that all of the subjects had suffered from a high degree of menstrual pain and that such pain had decreased their everyday activities, affecting their daily lives.

Kinesio taping is an auxiliary treatment that maximizes natural recovery ability and corrects the balance of the human body by adjusting electromagnetic flows on the skin, indirectly stimulating muscles or organs right under the skin using non-chemically-treated tape. This technique is said to promote three effects: to normalize muscular function; to increase lymphatic and vascular flow; and to diminish pain. It is considered to be a very simple, and safe treatment that has few side effects and continuously takes effect as long as the tape remains attached to the skin¹³⁾. Taping may increase or reduce muscle strength, and many investigators have hypothesized on to explain the possible underlying mechanism, proposing neurofacilitation and mechanical restraint, and a relationship between cutaneous afferent stimulation and motor unit firing¹⁴⁾. In other words, Kinesio tape decreases muscle tone and alleviates pain by inducing constant relaxation and contraction of the muscles through

Table 2. Comparison of menstrual pain and premenstrual syndrome between inter- group, intra-group between before and after

	Group	before	After	
Menstrual pain	1	7.4±1.5	3.3±3.0**+ ++	
	2	7.4±1.6	5.8±1.9*+	
	3	8.5±1.4	8.3±1.2	
low back pain	1	2.5±1.3	2.0±1.3	
	2	3.0±1.6	2.1±1.3	
	3	3.9±1.6	3.6±1.0	
headaches	1	2.0±1.3	1.6±1.1	
	2	2.0±1.4	1.5±0.7	
	3	2.9±1.8	2.6±1.6	
Premenstrual syndrome	breast	1	3.0±1.3	2.1±1.6
	tender-	2	2.5±1.2	1.7±1.3*
	ness	3	2.5±1.6	2.4±1.1
tension or anxiety	1	3.1±1.4	2.3±1.3	
	2	3.0±1.2	2.0±1.0*	
	3	3.0±1.3	2.8±1.2	
decreased activities	1	2.5±1.4	2.0±1.5	
	2	2.4±1.3	1.4±0.5*	
	3	2.4±1.2	2.3±1.0	

1: Kinesio taping, 2: spiral taping, 3: control group

*p<0.05 compared to the value before treatment; **p<0.01 compared to the value before treatment;

+ p<0.05 compared to the value of the control group

++ p<0.05 compared to the value of the spiral taping group

effective at maximizing natural healing power by stimulating organs through muscles right under the skin or reciprocal innervation¹⁰⁾.

It has been shown that menstrual pain is caused by the increased secretion of endometrial prostaglandin¹⁵⁾. Non-steroidal anti-inflammation drugs such as ibuprofen suppress prostaglandin synthetase, and for this reason, drug therapies are frequently used to ease menstrual pain¹⁶⁾. However, because drug therapies have adverse reactions, non-drug therapies have been investigated. Non-drug therapies include transcutaneous electrical nerve stimulation (TENS)¹⁷⁾, subcutaneous peripheral nerve stimulation (SPNS)¹⁸⁾, and acupuncture⁹⁾.

Prostaglandin plays the role of sensitizing pain in the spinal cord¹⁹⁾. Although TENS and SPNS have positive effects on menstrual pain, it is not known whether they decrease the secretion of prostaglandin. Because TENS and SPNS uses the pain gate mechanism that controls pain at the spinal cord by stimulating sensory fibers with large diameters such as tactile and vibratory senses in the skin, they can control menstrual pain by suppressing the sensitizing action of prostaglandin in the spinal cord to control menstrual pain. One of the key actions of Kinesio tape is suppression of pain by stimulation of the tactile fibers in the skin through the pain gate mechanism as well²⁰⁾. Therefore, Kinesio tape applied to the lower abdomen would have stimulated the tactile fibers in the skin suppressing the pain sensitizing action of prostaglandin in the spinal cord, thereby reducing menstrual

ing relieves not only musculoskeletal pain but also menstrual pain, which is internal pain, based on the significantly decreased menstrual pain of the subjects to whom Kinesio taping was applied.

Developed by Tanaka, spiral taping, also referred to as balance taping, is a method that attaches inelastic tape in a spiral direction after measuring electromagnetic flows through muscles and skin based on the principle of directivity and response points. This taping method, which comprehensively deals with the antigravity muscles responsible for the human body's functioning, treats, pain or diseases by adjusting functional balance between right and left muscles based on the idea that physical abnormalities result from imbalances in muscles that resist gravity¹¹⁾. In this study, the subjects' menstrual pain significantly decreased after applying spiral tape, indicating the effectiveness of the method. This study also demonstrated the effects of spiral taping on premenstrual syndrome, which is caused by physiological imbalance, by finding significant changes in breast tenderness, tension or anxiety, and decreased activity. Our present results are consistent with the theory that spiral taping eases pain, reduces inflammation, and induces muscle relaxation by restoring a normal energy flow of the circulating energy in the human body to a spiral shape²¹⁾. Spiral taping seems to have relieved premenstrual syndrome by restoring the abnormal energy flow during menstruation to its normal pattern.

As discussed above, we consider both Kinesio and spiral taping to be effective methods for alleviating menstrual pain and premenstrual syndrome. In other words, when experiencing such symptoms, these taping methods can be added to the list of existing treatments as medically recognized methods.

In this study, taping before menstruation induced significant changes in menstrual pain, which suggests that taping is an effective method of alleviating menstrual symptoms. Furthermore, considering that spiral taping resulted in significant changes in those suffering from premenstrual syndrome, which is caused by comprehensive and complex factors, this method can also be recommended for women as a strategy for coping with both menstrual pain and premenstrual syndrome. Nevertheless, this study had limitations in that the results may not be applied to parous women in other age groups because only unmarried women in their twenties and thirties were surveyed in this study.

Acknowledgement

This work was supported by the Gachon University research fund of 2013 (GCU-2013-M016).

REFERENCES

- Campbell MA, McGrath PJ: Use of medication by adolescents for the management of menstrual discomfort. *Arch Pediatr Adolesc Med*, 1997, 151: 905–913. [Medline] [CrossRef]
- Grandi G, Ferrari S, Xholli A, et al.: Prevalence of menstrual pain in young women: what is dysmenorrhea? *J Pain Res*, 2012, 5: 169–174. [Medline]
- Banikarim C, Chacko MR, Kelder SH: Prevalence and impact of dysmenorrhea on hispanic female adolescents. *Arch Pediatr Adolesc Med*, 2000, 154: 1226–1229. [Medline]
- Taylor D, Miaskowski C, Kohn J: A randomized clinical trial of the effectiveness of an acupressure device for managing symptoms of dysmenorrhea. *J Altern Complement Med*, 2002, 8: 357–370. [Medline] [CrossRef]
- Woods NF: Employment, family roles, and mental ill health in young married women: what is dysmenorrhea? *J Pain Res*, 1985, 34: 4–10. [Medline] [CrossRef]
- Connolly M: Premenstrual syndrome: an update on definitions, diagnosis and management. *Adv Psychiatr Treat*, 2001, 7: 469–477. [CrossRef]
- Dennerstein L, Lehert P, Heinemann K: Epidemiology of premenstrual symptoms and disorders. *Menopause Int*, 2012, 18: 48–51. [Medline] [CrossRef]
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*. 4th ed. Washington DC: American Psychiatric Association, 2000.
- Anil A, Peker T, Göktepe T, et al.: Importance of acupuncture on premenstrual syndrome. *Clin Exp Obstet Gynecol*, 2012, 39: 209–213. [Medline]
- What Does Kinesio Taping Do? <http://www.kinesiotape.ca/whatitdoes.htm> (Accessed Jan. 5, 2013)
- Danaka N: *Spiral balance taping therapy*. Gangju. Pyungwha ME CO, 1997.
- French L: Dysmenorrhea. *Am Fam Physician*, 2005, 71: 285–291. [Medline]
- Kase K, Tatsuyuki H, Tomoko O: Development of kinesio tape. *Kinesio taping perfect manual*. Kinesio Taping Assoc, 1996, 6–10: 117–118.
- Macgregor K, Gerlach S, Mellor R, et al.: Cutaneous stimulation from patella tape causes a differential increase in vasti muscle activity in people with patellofemoral pain. *J Orthop Res*, 2005, 23: 351–358. [Medline] [CrossRef]
- Dawood MY: Dysmenorrhea. *Clin Obstet Gynecol*, 1990, 33: 168–178. [Medline] [CrossRef]
- Dawood MY: Nonsteroidal anti-inflammatory drugs and changing attitudes toward dysmenorrhea. *Am J Med*, 1988, 25: 207–212.
- Kaplan B, Peled Y, Pardo J, et al.: Transcutaneous electrical nerve stimulation (TENS) as a relief for dysmenorrhea. *Clin Obstet Gynecol*, 1994, 21: 87–90.
- Walker JB, Katz RL: Peripheral nerve stimulation in the management of dysmenorrhea. *Pain*, 1981, 11: 355–361. [Medline] [CrossRef]
- Prostaglandin. <http://en.wikipedia.org/wiki/Prostaglandin> (Accessed Feb. 14, 2013)
- Kinesio-taping. <http://physiotherapymumbai.blogspot.kr/2012/10/kinesio-taping.html#2012/10/kinesio-taping.html> (Assessed Feb. 18, 2013)
- Spiral taping. http://www.krishnaya.com/spiral_taping_62.html (Accessed Dec. 29, 2012)