Relation of the factor to menstrual pain and musculoskeletal pain

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The purpose of the present study is to investigate the relationship between the regions of menstrual pain and of myofascial pain syndrome, which is the main cause of musculoskeletal pain, as well as to examine the changes and relationships among the menstrual pain-related factors, which are pain level, pain area, activity, appetite, mood, and sleeping pattern. The subjects were 13 sufferers of musculoskeletal pain and 17 non-sufferers. Pain diary and pain chart systems were used for the measurement of menstrual pain-related factors and musculoskeletal pain. Data were analyzed using repeated ANOVA. The results show that there are significant differences between the two groups in pain level, activity, and mood during menstruation periods ($P < 0.05$). The area of musculoskeletal pain and menstrual pain were found to be the same.

Keywords: Menstrual pain, Musculoskeletal pain, Activity, Appetite, Mood, Sleeping

INTRODUCTION

In the feature of women, menstruation has a comprehensive significance in terms of biological, cultural, social, and personal aspects. Menstruation is a periodic change which plays an important role in women's physical, emotional development, and reproduction (Granot et al., 2001). Dysmenorrhea, a term for menstrual discomfort, refers to menstrual pain that happens when prostaglandins cause excessive uterus contractions. Prostaglandins cause pain in the uterus and the stomach, as well as nausea, headache, and diarrhea. Menstrual pain is a form of dull splanchnic pain; it is non-localized and often hard to describe the pain site. Such pain might be felt in bones, muscles, and skin around organs (Kim and Kim, 2012).

Various treatments have been recommended to women to relieve menstrual pain. It is difficult to clarify the exact cause of menstrual pain, looking for proper treatments are also not so easy. Pain is caused by tissue damage, and pain induces emotionally unpleasant experience. Pain is the most common clinical symptom. However, its mechanism has not been clearly identified (Sirianni et al., 2015). Myofascial pain syndrome (MPS), radiculopathy, and osteoarthritis are some of the most common causes of acute or chronic pain. It was reported that MPS is the etiology of chronic pain about 40% (Kwon et al., 2008). MPS initiated oppressive leg or back pain, although the etiology is unknown (Giamberardino et al., 2011). Although the mechanism of pre and post-menstruation pain is different to the musculoskeletal pain, they are often confused when reporting pain. The study on the relationship between musculoskeletal and menstrual pain, it may provide a reasonable method to reduce menstrual pain.

Thus, the purpose of this study was to investigate the relationship between the region of menstrual pain and the region of MPS which is the main cause of musculoskeletal pain. In addition, we evaluated the changes and relationships among the menstrual pain-related factors, pain level, pain area, activity, appetite, mood, and sleeping pattern.

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MATERIALS AND METHODS

Participants

The subjects for the study were single working women suffering musculoskeletal pain in twenties, thirties and forties. Thirty subjects answered to the pain questionnaire. Subjects were divided into two groups: the suffering menstrual pain group and the non-suffering menstrual group. A simple questionnaire asking on the menstrual cycle, exercise pattern, and experience with surgery, and disease was used.

This study was conducted with 13 sufferers of menstrual pain and 17 non-sufferers of menstrual pain. All subjects had not experienced surgery in the past five years, did not have peripheral nerve disorder, radiculopathy, and had menstruated regularly (Table 1).

Experimental procedures

The pain diary was used to observe the relationship between menstrual pain-related factors and musculoskeletal pain. It consisted of a Visual Analog Scale (VAS), face pain scale, pain diagram, and pain chart system (Park and Kang, 2009). Behavioral symptoms, such as physical activity level and appetite, and psy-chological symptoms, such as mood and sleeping pattern, were also measured to check pain level.

Statistical analyses

The pain diary measured ten times, was analyzed using repeated measure ANOVA with Bonferroni's correction to compare the suffering group and the non-suffering group in daily pain level, physical activity, appetite, mood, and sleeping pattern during menstrual period. SAS 9.1 (SAS Institute Inc. Cary, USA) was used for the data analysis and the statistical significant level was $P < 0.05$.

RESULTS

Level and area of pain
Pain level

The musculoskeletal pain in the menstrual suffer group was higher than in the non-suffer group at the first day of menstruation. This result suggests that the women suffering menstrual pain also showed severe musculoskeletal pain (Fig. 1).

Pain area

The pain chart system was used to identify the detail areas of pain. The most common pain region was back, stomach, the chest, the shoulders, the arms, the legs, the head, and then other areas. In the back, the *quadratus lumborum* muscle was most severe pain area. In the abdomen, the *rectus abdominis* muscle was most severe pain area. In the chest, the *quadratus lumborum* muscle is most severe pain area (Fig. 2).

Activity

The daily activity in the non-suffer group was higher than in the suffer group ($P < 0.05$) (Fig. 3).

Table 1. Physical characteristics of the subjects

Group (n = 30)	SMP (n = 13)	NSMP (n = 17)
Age (yr)	23.26 ± 2.92	24.10 ± 5.04
Height (cm)	163.26 ± 8.45	165.11 ± 7.15
Weight (kg)	57.85 ± 42.67	58.05 ± 14.01

Values are means ± SD. SMP, suffering from the menstrual pain; NSMP, non-suffering from the menstrual pain.
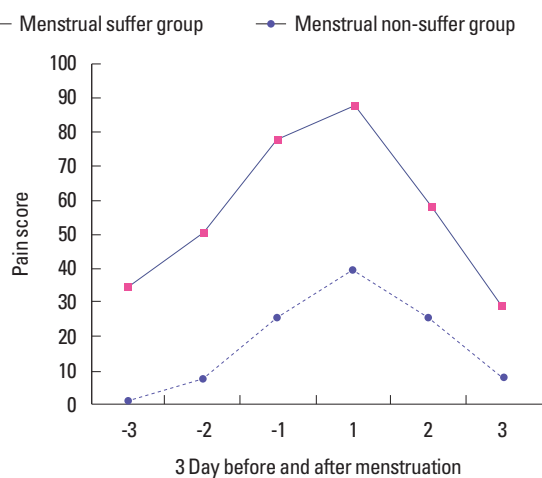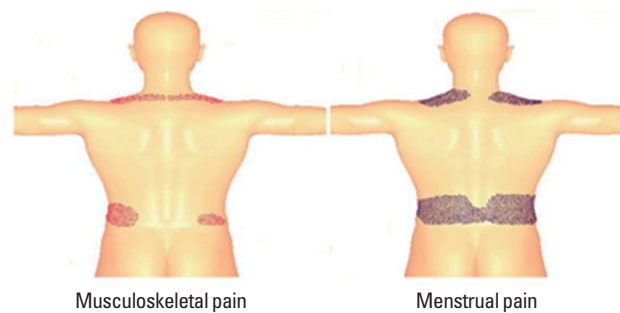

Fig. 1. Pain level.

Musculoskeletal pain   Menstrual pain

Fig. 2. Pain area (three-dimensional virtual human model system).

(X axis-1: Pre, 2:1th (after 4 day), 3:2th, 4:3th, 5:4th, 6:5th, 7:6th, 8:7th, 9:8th, 10:Post)
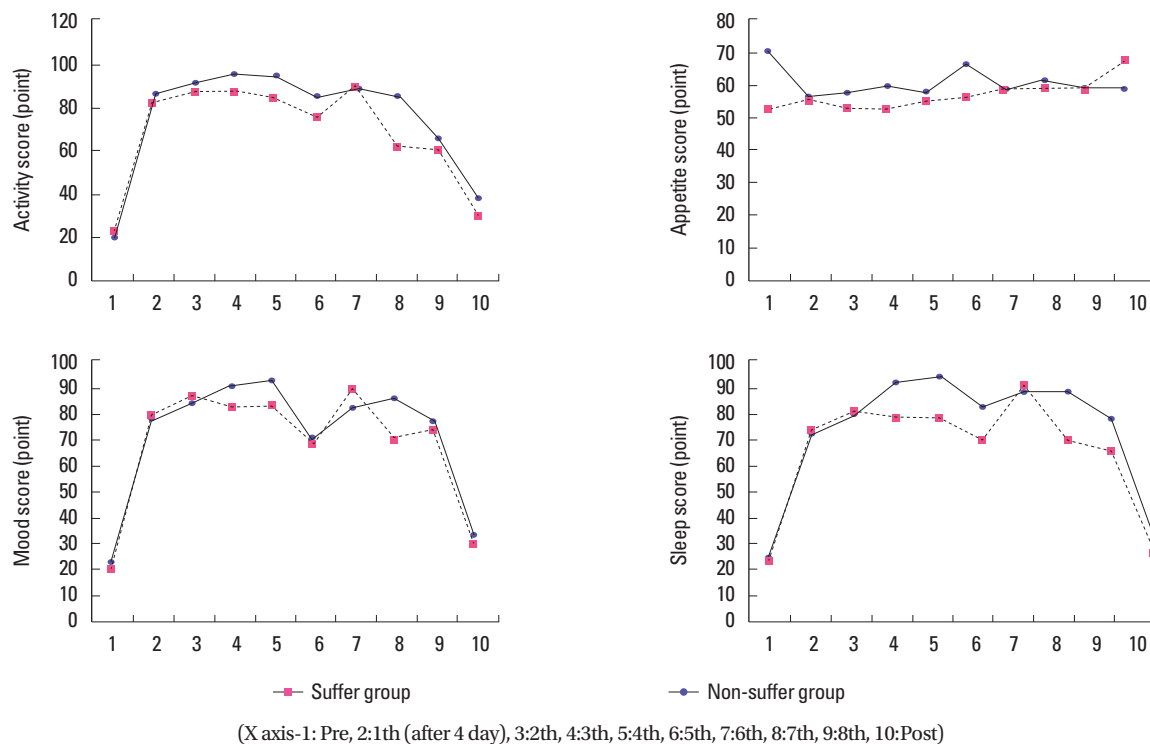
Fig. 3. Changes in menstrual pain-related variables.

Appetite

Appetite in suffer group and non-suffer group was decreased before menstruation however was increased at starting menstruation. There was no statistical difference in the appetite between suffer group and non-suffer group (Fig. 3).

Mood

The mood score in the non-suffer group was higher than suffer group. The mood score was lowest at the first day of menstruation in both groups ($P < 0.05$) (Fig. 3).

Sleeping pattern

The sleeping score in the non-suffer group was higher than suffer group ($P < 0.05$) (Fig. 3).

DISCUSSION

Various symptoms that occur before and during menstruation are called as premenstrual symptoms. Premenstrual symptoms refer to different physical, mental, emotional, and behavioral symptoms and are influenced by psychological, social, and cultural factors. Generally, negative attitudes toward menstruation lead to negative responses. Most of women in their childbearing years suffer from periodically repeated premenstrual symptoms (Firoozi et al., 2012). Medication and physical therapy have been used to relieve pain. However, the mechanisms of menstrual pain are not clearly clarified, the proper treatment has not been developed. The present study showed that the pain level and area in the women suffering musculoskeletal pain were similar to those suffering menstrual pain. Because the featured pain is felt in regions far away from the myofascial trigger point, it is often confusing to locate the correct initiating area of the pain (Iacovides et al., 2013).

The primary goal for musculoskeletal pain patients is recovering locomotion and relieving pain. Without improvement in movement and locomotion, attempts to relieve pain are limited in terms of musculoskeletal function. Therefore, various exercise therapies have been suggested for the functional recovery of musculoskeletal system in menstrual pain suffering women. As menstrual pain induces musculoskeletal pain, exercise therapy for musculoskeletal pain might be helpful for menstrual pain (Hooper et al., 2011). The results of this study revealed that the characteristics of musculoskeletal pain depend on the severity of menstrual pain. Also, even though pain before and during menstruation and musculoskeletal pain are different in their meanings, they are often confused when sufferers report the discomfort. It is well known that menstrual pain initiated diverse musculoskeletal pain.

Iacovides et al. (2013) reported that before menstruation, pain is felt in the abdomen, lower back, breasts, pelvis, lower extremities, and shoulders, after menstruation, increased pain is felt in the abdomen, lower back, and pelvis, and this pain was reduced by working (Park and Kang, 2009).

This study focused on the specific symptoms of menstruation. However, it failed to control environmental factors because menstruation starting days are different. Controlling of environmental factors is needed for further studies.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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