JTCM 中医杂志 Journal of Traditional Chinese Medicine

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J Tradit Chin Med 2017 April 15; 37(2): 220-228
ISSN 0255-2922

CLINICAL STUDY

Comparative study on skin temperature response to menstruation at acupuncture points in healthy volunteers and primary dysmenorrhea patients

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Supported by the National Basic Research Program of China (973 Program) -the Effect of De *Qi* on Acupoint Specific Effect Based on Meridians and its Characteristics and Molecular Response Mechanisms (No. 2012CB518506); Research on Acupoint Specificity in Regulating Uterus (No. 2006CB504503); and National Natural Science Foundation of China-Research on Variations of Biophysical Properties of Acupoints on Different Meridians with the Same Spinal Segments Based on Primary Dysmenorrhea (No. 81573884)
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Accepted: August 25, 2016

Abstract

OBJECTIVE: To assess skin temperature response to menstruation at acupuncture points in primary dysmenorrhea (PD) patients and healthy volunteers so as to explore acupuncture point specificity in reflecting diseases in the light of skin temperature.

METHODS: Fifty-two PD patients and 49 healthy volunteers were recruited. Skin temperature measurements were performed with a skin temperature assessment device at 10 points. Absolute difference between skin temperature of the same point on the left and right side is used as main outcome measure.

RESULTS: On the first day of menstruation, when menstrual pain attacking in PD patients, a significant increase in skin temperature difference was detected at Taixi (KI 3) compared with the healthy group ($P < 0.01$). A significant reduction in skin temperature difference was detected at Taixi (KI 3) in the first day of menstruation compared with those values in the third day after menstruation ($P < 0.01$) in the healthy group. On the third day after menstruation, a significant reduction in skin temperature difference was found at Zhongdu (LR 6) in PD group compared with the healthy group ($P < 0.05$). No significant differences of skin temperature were detected at other points ($P > 0.05$).

CONCLUSION: The skin temperature difference at menstruation-relevant points in PD patients did not all change significantly more than those in women without PD. Significant difference was only

found in Taixi (KI 3), the *Yuan*-source point of Kidney meridian.

Keywords: Dysmenorrhea; Menstruation; Skin temperature; Point LR 6 (Zhongdu); Point KI 3 (Taixi); Kidney meridian; Comparative study

INTRODUCTION

Chinese acupuncture theory holds that acupuncture points are not only the sites to receive the stimulation by acupuncture but also the external sensitive points reflecting the diseases. Moreover, it is widely believed in Traditional Chinese Medicine (TCM) that functions of each acupuncture point are specific. Thus point specificity is considered as the main basis for diagnosis and selecting points in acupuncture practice. However, specificity of acupuncture points has been questioned due to inadequate scientific evidence.[1-4] A scientific understanding of point specificity will absolutely be necessary for the increased acceptance of acupuncture by the modern medical community. A number of methods have been used to identify specificity of acupuncture point, including functional magnetic resonance imaging (fMRI)[5-10] thermography, ultrasound sonography, and other bioelectric methods.[11,12] Most of those studies mainly focused on exploring its therapeutic specificity. Studies focusing on acupuncture point specificity in reflecting diseases are still rare.

Primary dysmenorrhea (PD) is the most common gynecological complaint in women of reproductive age and affects their school, sports and social activities.[13,14] One of our clinical trial showed that the most common TCM pattern of PD was Cold and Dampness Stagnation pattern,[15] which seemed have certain relationship with temperature at acupuncture points. So, are there any changes on skin temperature at acupuncture points during menstruation as well as when menstrual pain attacking?

Infrared thermography has been widely used in recent years for evaluating peripheral effects of acupuncture,[16-18] and assessing temperature property of points under certain pathological conditions so as to assist diagnosis.[19-21] Although it is a good method to measure skin surface temperature at certain areas of the body,[22] it is not suitable to detect the skin temperature at accurate locations of acupuncture points due to limitation caused by body position, particularly when the points located at different parts of the body need to be measured simultaneously. Therefore, a high-accuracy skin temperature detector is required for providing more evidence of thermal specificity of points. Classic Chinese acupuncture theory believes that specific acupuncture points, particularly *Yuan*-source points and *Xi*-cleft points have more significant properties to reflect the physiological and pathological conditions of distant target organ systems.[23] Modern research also showed that certain diagnostic zones on the skin in Western Medicine had relationship with certain specific points.[24]

Skin temperature reflects the condition of nervous function, metabolism and blood circulation, or the flow of *Qi* and blood in terms of TCM, therefore, it always used as an objective index for indicating physiologically and pathological changes of the body. Therefore, we propose a hypothesis that is group median skin temperature difference at menstruation-relevant points in patients with dysmenorrhea may change significantly more than those in women without dysmenorrhea. We carried out this study to measure skin temperature at different acupuncture points, during and after menstruation in PD patients and healthy women, for the purpose of exploring point specificity in reflecting diseases.

MATERIALS AND METHODS

Setting and participants

Fifty-two PD patients aged (23.5 ± 2.6) years and 49 healthy volunteers aged (23.6 ± 2.5) years were recruited on the campus of Beijing University of Chinese Medicine (BUCM, Beijing, China), where the trial was conducted. All volunteers signed an informed consent form before participation. The Medical Ethics Committee of BUCM approved the trial.

Eligible participants in dysmenorrhea group met the following inclusion criteria: (a) met the diagnostic criteria of PD in the Primary Dysmenorrhea Consensus Guideline;[25] (b) age 15-30 years without history of delivery; (c) with normal menstrual cycle [(28 ± 7) days]; (d) course of dysmenorrhea varying from 6 months to 15 years; (e) experienced menstrual pain scoring more than 40-mm on a 100-mm VAS during the menstrual period prior to present menstrual period with temperature measurement; (f) no oral administration of any analgesic nor acceptance of other therapies in 24 h before the trial; (g) no common cold in one week before the trial and with normal body temperature.

Women with secondary dysmenorrhea caused by endometriosis, uterine myomas, endometrial polyps, pelvic inflammatory disease, and other gynecological problems, were excluded. Women with scars on the skin at measured points were excluded.

Participants in healthy group had no history of chronic diseases and were healthy at the time of enrollment. Inclusion criteria of age and duration of menstrual cycle were the same as those in PD group. Considering that some Chinese people may have a basic knowledge of acupuncture points and acupuncture, participants with history of acupuncture treatment and knowledge of the effects of acupuncture points were excluded in both groups.