Association between acupuncture applied during menstruation and change of menstrual cycle among female patients: a observational prospective study in Northern China

Abstract

Background: Previous studies demonstrated that acupuncture is a safe treatment in general population, however, the safety of acupuncture during menstruation remains controversial. This study aimed to evaluate the safety of acupuncture during menstruation, using change of menstrual cycle as primary outcome.

Methods: women who were going to receive at least 12 times acupuncture in the coming one month regardless of diagnosis, and experienced at least one menstruation during the period were recruited from four hospitals in Northern China from March 2017 to March 2018. Patients were followed up 3 menstrual cycles since acupuncture treatment, and data was collected through a questionnaire at baseline and 3 follow-up visits. Chi-square tests and logistic regression were used to test the associations between timing of acupuncture and change of menstrual cycle.

Result: there were 373 female patients included in analysis, of which 208(55.8%) had acupuncture during menstruation(AM group) and 165(44.2%) did not(NM group). Nearly one fifth(68, 18.2%) of all patients experienced a change in menstrual cycle. The percentage of patients with changed menstrual cycle in AM group(19.7%) was higher than that of NM group(16.4%), but the difference was not significant(OR 1.254, 95% CI 0.647 to 2.431, P=0.503) when adjusted for age, history of menstrual cycle and diagnose.

Conclusion: This study indicated that the rate of menstrual cycle change did not differ among patients who received acupuncture during menstruation or not. However, the interpretation and conclusion of the results should be cautious due to the limitations of the study.

Key Words: acupuncture, timing, menstrual cycle change, adverse events, safety

Statements

Question: What's already known about this topic?

Answer: Previous studies demonstrated that acupuncture is a safe treatment in general population, however, the safety of acupuncture during menstruation remains controversial.

Question: What does this article add?

Answer: The result of the study showed that the rate of menstrual cycle change did not differ between acupuncture during menstruation group and non acupuncture during menstruation group.

Background

Acupuncture has been applied in treating many kinds of gynecological diseases, such as dysmenorrhea[1,2], pelvic inflammatory disease[3], diminished ovarian reserve[4], stress urinary incontinence[5] and etc. Both individual studies and systematic reviews demonstrated that acupuncture is a safe treatment in general population[6–8], however, the safety of acupuncture during menstruation remains controversia[9,10]. Some case reports[11–13] showed that after acupunctured during menstruation, patients suffered persistent irregularity of menstruation and specific adverse symptoms, such as abdominal pain, vomiting, headache, sweating or

palpitation, which led to refusal of acupuncture during menstruation by some female patients. Nevertheless, other researchers believe that there is no incremental adverse effect if acupuncture is applied during menstruation, and yet evidence remains scarce. Therefore, this study aimed to evaluate the safety of acupuncture during menstruation, using change of menstrual cycle as primary outcome.

Methods

Study Design

The study was a prospective observational study conducted in Beijing and Shandong Province from 23rd March 2017 to 20th March 2018. Patients were recruited from four hospitals in Northern China, including Guang'anmen Hospital and Acupuncture Hospital of China Academy of Chinese Medical Sciences in Beijing, Shandong Traditional Medicine Hospital of Shandong University of Chinese Medicine, and Shandong Hospital for Women and Children.

With a power of 90% and significant level of 5%, a sample size of 358 patients was required to detect a 15% difference in change of menstruation between two groups(patients who choose to have acupuncture during menstruation and those not) and 10% loss of follow-up rate, given the incidence of irregular menstrual cycle was 14.2% among general population based on previous study[14, 15](calculation by PASS 15 software).

Inclusion and exclusion criteria

Patients were included if they 1) were women with or without regular menstrual cycle; 2) were going to receive at least 12 times acupuncture therapy(3 times a week) in the coming one month regardless of diagnosis, and experienced at least one menstruation during the one month acupuncture; 3) provided signed informed consent form. Patients were excluded if they 1) had severe health conditions, including severe heart, liver, or kidney diseases, terminal stage of cancer, severe malnutrition, autoimmune disease, hematological disease, etc.; 2) were administrating any kinds of medication affecting the menstrual cycle; 3) were pregnant; 4) had any kinds of cognitive problems.

Exposure

Patients started their acupuncture treatment right after enrollment and received acupuncture for at least one month(3 times a weeks, 12 times in a month) regardless of their diagnosis. Patients who choose to have acupuncture during their menstruation were followed and analyzed as acupuncture during menstruation group (AM group), and patients who choose not to have acupuncture during menstruation were as non-acupunctured during menstruation group (NM group).

Data collection

Data were collected at enrollment(baseline), after the first menstruation since enrollment(could be during or after the one month treatment, 1st follow-up), after the second

menstruation since enrollment (2nd follow-up), and after the third menstruation since enrollment (3rd follow-up). Patients were required to complete a short questionnaire at baseline and each of the three follow-ups. The first two questionnaire was completed with assistance from trained interviewers in the acupuncture clinic, and the last two were completed either during follow-up visits in the acupuncture clinic or by telephone. Information collected by the questionnaire included seven aspects: 1) history of menstrual cycle (regular or irregular) : irregular menstrual cycle was defined as inconsistent intervals between two periods with a variation of more than 7 days in three consecutive months[16, 17]; 2) details of last menstruation; 3) whether patients, by voluntary, received any acupuncture during their menstruation during the one month treatment; 4) whether patients experienced any change in menstrual cycle compared with last menstrual cycle in each of the follow-up: change of menstrual cycle after acupuncture was defined as variation of 7 days or more between the last two cycles[14]; 5) any other adverse events experienced during menstruation during the study period. Adverse events included nausea/vomiting, anxiety, fatigue, palpitations, headache, and sweating. 6) details of acupuncture treatment: type of acupunctures, including electroacupuncture (EA), manual acupuncture (MA), and others; type of acupoint areas, including “head and neck”, “thorax and abdomen”, “ lumbosacral and dorsum”, and “lower and upper extremity”; 7) age and diagnose of patients.

The menstruation-related questions sought for both quantitative and qualitative responses, where necessary, to obtain numerical data and to learn how woman perceive any menstrual abnormality. Data collection was inspected by research supervisor on a regular basis.

Statistical analysis

Data analysis was performed by SPSS 20. Continuous variables was described in the form of mean and standard deviation (normal distribution), or percentile (non-normal distribution), while categorical variables in the form of percentage. Logistic regression was performed to analyze association between timing of acupuncture (whether during menstruation or not) and change of menstrual cycle adjusted for confounders. A two-sided p value of 0.05 or less was considered to indicate statistical significance.

Ethical approval and informed consent

The study protocol was registered in Chinese Clinical Trail Registry (Registration No. ChiCTR-ONC-17012705), and approved by the Ethics Committee of the Guang’anmen Hospital, China Academy of Chinese Medical Sciences (Approval number: 2017-007-KY). Informed consents were obtained from all patients enrolled in the study. Identifiable personal information were not collected, and all data were kept confidential and only accessible to authorized researchers.

Result

There were 407 female patients recruited in this study from 23rd March 2017 to 20th March 2018. Twenty patients withdrew from the study at the beginning due to personal reasons, and fourteen patients were excluded because of pregnancy or taking medicine that can affect

menstrual cycle during follow-ups.

There were 373 patients included in analysis, of which 208 (55.8%) had acupuncture during menstruation (AM group) and 165(44.2%) did not have any acupuncture during menstruation (NM group). The average age of enrolled patients was 37.1 years, and 71.8% of patients were in the 30 to 39 and 40 to 49 age groups. More than two thirds of patients (70.5%) had regular menstrual cycle in the past, and the proportions of patients with or without regular cycle were comparable in the two groups (P=0.196). The diagnosis of patients varied from orthopedic disease to gynecological disease to neurological diseases, with low back pain (16.4%), ovarian hypofunction (13.1%) and obesity (12.6%) as the top three ones. However, the proportion of patients with each diagnosis was quite different in AM and NM groups (p=0.001). Application of manual acupuncture (MA, 65.1%) was about two times higher than electroacupuncture (EA, 29%) among patients, and proportions of EA and MA were comparable in the two groups, respectively. The most popular acupoint area was lower and upper extremities (77.7%), compared with thorax and abdomen (63%), lumbosacral and dorsum (63%), and head and neck(61.1%)(Table 1).

Among all patients, nearly one fifth (68, 18.2%) of them experienced a change in menstrual cycle regardless of their history of menstrual cycle. The percentage of patients with changed menstrual cycle in AM group(19.7%) was higher than that of NM group(16.4%), but the difference was not significant(OR 1.254, 95%CI 0.647 to 2.431, P=0.503) when adjusted for age, history of menstrual cycle and diagnose. When looking at long term effect of acupuncture during menstruation, 10 (2.7%) and 42 (11.3%) patients experienced changes in two or three consecutive menstrual cycle, respectively. However, there was no significant difference on rates of change in either two (OR 2.306, 95%CI 0.562 to 9.472, P=0.246) or three (OR 1.461, 95%CI 0.623 to 3.428, P=0.383) consecutive menstrual cycles between the two groups, respectively, when adjusted for age, history of menstrual cycle and diagnose (Table 2).

In subgroup analysis, the rate of changed menstrual cycle among patients with history of irregular menstrual cycle (41.8%) was about five times higher than that in patients with history of regular menstrual cycle (8.4%). However, there was no significant difference detected on rate of menstrual cycle change between AM and NM groups among patients with history of either regular(OR 1.147, 95%CI 0.424 to 3.105, P=0.787) or irregular menstruation(OR 1.780, 95%CI 0.666 to 4.759, P=0.251), when adjusted for age and diagnosis. Similarly, there was no significant difference on rates of changed menstrual cycle between the two groups across different age groups with or without adjustment of confounders (Table 2).

Among patients with different diagnosis, it found that the rate of changed menstrual cycle in AM group was much higher than that in NM group among patients with low back pain (n=61) when adjusted for age and history of menstrual cycle (adjust OR 6.5, 95% CI 1.334 to 32.065, P=0.021), however, no such difference was detected in patients with other disease. It is worth noticing that the sample size in each diagnosis group was quite small (Table 2).

In terms of other adverse event occurred during menstruation during the study period, there were seven types of adverse events identified in this study, including nausea/vomiting, anxiety,

fatigue, palpation, headache, and sweating. However, there was no significant difference on the rate of all adverse event (OR 1.243, 95%CI 0.627 to 2.467, P=0.533) and each type of adverse event between AM and NM groups (table 3).

Discussion

The result indicated that acupuncture during menstruation was not associated with changed menstrual cycle and other adverse event occurred during menstruation, when following up to three menstrual cycles since the acupuncture treatment. However, conclusion needs to be made with cautious for reasons discussed as follows.

There were a number of individual studies or systematic reviews with large sample size to investigate the spectrum and frequency of adverse events associated with acupuncture in either Eastern or Western population[18, 19]. Although there were some variations on rate of adverse events, the results of reported studies were consistent, confirming that acupuncture is a relatively safe treatment option. However, detailed evidence regarding any changes of menstruation (incl. change of menstrual cycle, volume, duration, etc.) as adverse events associated with acupuncture during menstruation was scarce.

A German study[6] reported that the observed incidence of menstrual problem(without a clear definition) after acupuncture was 0.014%(32/229,230 patients), which was much lower than the incidence of changed menstrual cycle observed in this study(18.2%). Such difference could be explained from several aspects. The disparity on definition of menstrual problems in the two studies, which may contain change of menstrual cycle, volume, duration, and dysmenorrhea, etc., may lead to such variation on incidence rate observed. In addition, as the data of adverse events in the German study was collected right after acupuncture treatment, data on any changes of menstruation was likely to be missed, resulting in underestimation of the incidence rate. In contrast, follow-up and data collection of this study lasted for three menstrual cycles since acupuncture treatment, and were likely to capture two to three menstrual cycle for most patients.

Concerns or awareness of female patients on any potential changes on menstruation after acupuncture could also contribute to the choice of acupuncture during menstruation and report of such symptoms as adverse event. Having no information on timing of acupuncture provided in the German study[6], if none of the female patients chose to be acupunctured during menstruation, then it was less likely to capture any adverse events associated with such action if any. And if female patients were not fully aware that some menstruation changes could be associated with acupuncture, they were not likely to report on any relevant symptoms. Having a long history of acupuncture in China, some female patients are quite concerned about the timing of acupuncture, and choose not to be acupunctured during their menstruation without any scientific evidences.

In addition, the type of diseases treated by acupuncture and history of irregular menstruation could also vary the presence of adverse event associated with menstruation, as well as type of acupuncture. In the German study, patients with chronic osteoarthritis pain of the knee or hip, low back pain, neck pain or headache, allergic rhinitis, asthma, or dysmenorrhea were included[6], whereas, patients with ovarian hypofunction, obesity and menstruation disorders,

which can lead to irregular menstruation, counted for 41% of all patients included in this study. Patients with such kinds of disease had higher risk of having irregular menstrual cycle before and after treatment, hence, the rate of changed menstrual cycle among patients associated with acupuncture in this study was likely to be amplified compared with other studies. Moreover, patient-time was used as the denominator when calculating the incidence rate of adverse events in some studies[8, 20] rather than the number of total patients included in this study. Thus, the incidence rate the former studies could be much higher than that in the later.

The result indicated that the chance of experiencing changes in 3 consecutive menstrual cycles was higher than that of 2 consecutive menstrual cycles, and the trend seemed true in both AM and NM groups. Patients who had acupuncture more than one month may experience an accumulative effect at a later stage. However, we did not collect data on any acupuncture treatment after the first month, as well as data on change of hormone level and ovulation that could affect menstruation of patients, it was difficult to confirm whether the increase in chance of seeing change in 3 consecutive menstrual cycle was a result of treatment effect or pure chance due to small sample size.

The result also presented six types of adverse events occurred during menstruation, and none of them were significantly different in incidence rate between AM and NM groups, which indicated that these adverse events may not be associated with acupuncture applied during menstruation. The incidence rates of those adverse event were close to other studies[21], however, due to lack of control group without acupuncture, it was not possible to determine whether these adverse events were associated with acupuncture or not[22–24].

The study had some limitations. First of all, the sample size of the study was relatively small and may not have enough power to capture the difference on the rates of menstrual cycle change between the two comparing groups. The detection of effects of other influencing factors, such as disease type, history of irregular menstrual cycle, choice of acupoints and type of acupuncture were also limited due to the sample size. Secondly, underlying factors that affect menstrual cycle, including hormone level, ovulation and other gynecological diseases, were not measured in this study. Other possible changes to menstruation, including the changes in volume of bleeding and severity of dysmenorrhea during menstruation, were not covered in this study as well. Thirdly, due to lack of non-acupuncture control group in this study, it was not possible to know whether the adverse events occurred during menstruation were associated with acupuncture per se or not. Last but not the least, the total treatment time, type and severity of other adverse events associated with acupuncture during menstruation were not evaluated in the study. Therefore, a full-scale evaluation of the safety of acupuncture during menstruation requires further studies.

Conclusion

This study indicated that the rate of menstrual cycle change did not differ among patients who received or did not received acupuncture during menstruation. However, the interpretation and conclusion of the results should be cautious due to the inherent limitations of the study. In addition, association between acupuncture and other adverse events occurred during

menstruation also requires further investigation.

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