Original Article
Effects of acupressure and music therapy on reducing labor pain

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Abstract: Purpose: The present study aimed to assess the clinical effects of acupressure and music therapy on alleviating the labor pain, and investigate whether the combination of both interventions exerts better nursing outcomes for puerperas. Materials and methods: A total of 241 pregnant women were enrolled and randomized into four groups: including acupressure group (n=60, who received acupressure), music group (n=60, who received music therapy), combination group (n=62, who received acupressure and music therapy) and control group (n=59). The visual analog scale (VAS) was conducted to evaluate the postpartum pain intensity and anxiety levels after the intervention. Results: Acupressure or music therapy could reduce the labor pain significantly. Acupressure had an advantage on decreasing the uterine pressure compared to music therapy, whereas the music therapy owned more benefits on reducing the anxiety levels of puerperas than acupressure. Moreover, the combination therapy could also reduce the intensity of labor pain greatly and seemed to be superior to the single therapies in some parameters. However, no significant difference was found between combination therapy and single therapies on relieving pain intensity. Conclusions: Acupressure and music therapy could both reduce labor pain effectively, while music therapy had better effects totranquilize the subjects. The combination of acupressure and music treatment could be used as a cost-effective, safe and accessible treatment for reducing the suffering with childbirth.

Keywords: Acupressure, music, labor pain, postpartum, VAS, childbirth, pregnant

Introduction

Labor pain is one of the most severe pains on human beings around the world, despite the difference of individual feelings [1]. During the childbirth, the cervix and obstetric canal were opened with severe uterine contractions, which made the pregnant women suffered sharp pain [2]. The inevitable pain remarkably affects the mental and physical condition of the women. It was widely believed that if the management of pain was not performed well during the childbirth, the tolerance threshold of parturient women will decrease promptly. Furthermore, the labor pain could not only alter the stress state of women, studies also reported that a series of plasma inflammatory cytokines were associated with labor pain [3]. Considering the intensity, duration and individual characteristics, various degree of hypertension, and increasing of heart rate could probably serve a

negative role in women's health, even affecting the maternal and infant relationship [4]. Due to the enormous pressure caused by childbirth on parturient women, a more effective non-invasive nursing method for reducing labor pain was thus urgently needed.

Up to now, multiple nursing methods for reducing labor pain were identified, which can be divided into pharmacological and non-pharmacological methods. Although the palliative drugs were proven to be much effective on reducing labor pain, the side effects were also found in mothers and infants, including fatal debilitation of the central nervous system [5, 6]. Currently, the most effective method is intrathecal labor analgesia; however, the optimal agent and dose adopted in this method remains divergent [7-9]. Besides, various complementary and alternative approaches for pain management in labor were performed in clinical,

including acupuncture, audio-analgesia, acupressure, aromatherapy, hypnosis, massage, and music therapy [10, 11], and these non-invasive methods could help reduce suffering and relieve pain in labor, indicated by the data from several studies. Although these methods have obtained satisfaction from many women, further studies were needed to confirm their effectiveness.

Among several non-pharmacological methods, acupressure has been proven to be effective on relieving pain among populations. Many cases adopted acupressure as a complementary treatment under childbirth process, for it only required fingers and hands to press acupoints [12, 13]. Furthermore, music was another common method applied for pain relief, for music can help people feel relax and joyful. Studies also showed that listening music can reduce pain intensity levels and opioid requirements [14]. However, Smith et al. investigated several relaxation techniques for labor pain management, and considered the evidence for the function of music was insufficient [15]. Accordingly, further studies were required to verify the utility of these complementary treatments.

Although the effects of acupressure and music therapy were discussed in previous studies, the comparison between the two non-pharmacological labor pain relief methods has not been well performed. Moreover, the combination of non-invasive treatments on alleviating labor pain has not been investigated yet. Thus, we aimed to compare the effects of acupressure and music treatment on labor pain reduction. Besides, the study evaluate whether the combination of acupressure and music therapy could provide more advantages on reducing labor pain during childbirth.

Materials and methods

Participants

A total of 238 pregnant women hospitalized in West China Women's Hospital (Chengdu, China) between February 2015 and June 2016 were enrolled into the present study. This study was approved by the Research Ethics Committee of West China Women's Hospital (Chengdu, China). The study protocol was informed to each participant and the informed consents

were signed by all patients before experiment. The included women needed to be satisfied with the following criteria: (1) age between 20 and 35 years; (2) gestation with 37-41 weeks, primiparity, pregnant with single baby of cephalic presentation who were expected to have natural spontaneous delivery; (3) without severe risk symptoms under examination. The exclusion criteria were patients who were under obstetric complications or had the habits of alcohol and smoking. The information of age, BMI, education level and the basic characteristics of participants was recorded.

Procedures

The participants were divided randomly into four groups, acupressure group (received only acupressure treatment, n=60), music group (received only music treatment, n=60), combination group (received acupressure and music combined treatment, n=62) and control group (without special treatment, n=59). In the acupressure group, the acupressure was performed at Hegu point rotationally for 10 min, with 5 min pressure and 15 min break, which was based on the previous studies [16]. In the music group, in consistent with the protocol of Serap's study, music was played with a 20 min break for every two hours [17]. The following music including relaxing, soft and regular rhythmic patterns was recommended to participants. The participants in the combination group were received acupressure and listening music simultaneously, while the control group did not receive these methods. The anxiety and pain level was recorded at 1, 4, 8, 16, 24 h after intervention. The satisfaction to childbirth was collected at 2 and 24 h after intervention within the postpartum period. All the interventions were conducted during the active phase of the first stage of labor.

Outcome evaluation

The VAS (visual analogue scale) method was used to evaluate the effect of intervention on women. The VAS-A (VAS for anxiety) indicated the anxiety level during the postpartum period, with 0 means no anxiety or the least possible anxiety, 10 means severe anxiety or the worst possible anxiety. The survey was conducted by two blinded investigators to avoid the possible of subjective intervention on reporting anxiety scores. The patients were required to score

Table 1. The demographic characteristics of participants enrolled in this study

Characteristics	Acupressure group	Music group	Combination group	Control	Value
Cases	60	60	62	59	
Age	26.18±3.25	25.57±3.11	26.70±3.87	26.02±2.90	$P>0.05$
BMI	26.02±2.90	27.13±2.47	27.61±1.94	27.22±2.41	$P>0.05$
Education background					
Junior High School	22 (36.7%)	20 (33.4%)	22 (35.5%)	20 (33.9%)	$X^2=0.99$
Senior High School	13 (21.7%)	14 (23.3%)	16 (25.8%)	13 (22.0%)	
Collage/University	25 (41.6%)	26 (43.3%)	24 (38.7%)	27 (45.1%)	

P value represents the significance level of the one-way ANOVA test. X^2 value represents the significance level of Chi-square test.
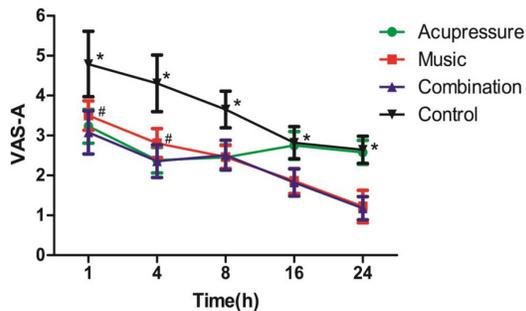

Figure 1. The comparison of VAS-A scores among groups. The VAS-A indicated the anxiety level of laboring women. *Represented the comparison of intervention groups versus control, *$P<0.05$. The VAS-A scores in music group and combination group showed significant difference than control through all time points (all *$P<0.05$). # represented the comparison with music group, #$P<0.05$. The VAS-A at 1 h and 4 h of acupressure group and combination group were significantly less than music group (all #$P<0.05$).
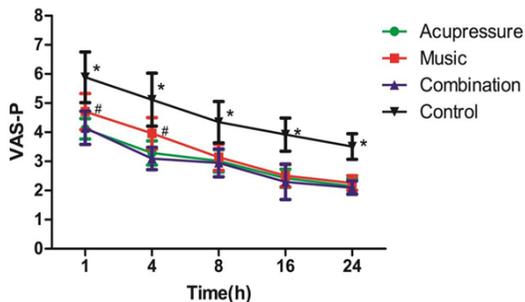

Figure 2. The VAS-P in different groups. *Represented the comparison of intervention groups versus control, *$P<0.05$. Acupressure, music and combination groups all showed significant less VAS-P than control through all time points (all *$P<0.05$). #represented the comparison with music group, #$P<0.05$. The VAS-P at 1 h and 4 h of acupressure group and combination group were significantly less than music group (all #$P<0.05$).

their anxiety level at 1, 4, 8, 16, 24 h after intervention. The result of VAS-A was compared among the groups. The VAS-P (VAS for pain) indicated the pain intensity during the postpartum period, with 0 means no pain or the least possible pain, 10 means severe pain or the worst possible pain. The survey was conducted by a blinded investigator to avoid the possible of subjective intervention on reporting pain scores. The patients were required to score their pain intensity at 1, 4, 8, 16, 24 h after intervention. The result of VAS-P was compared among the groups. The satisfaction rate with child birth was also assessed by VAS, with 0 means totally unsatisfied, 10 means totally satisfied. The survey was conducted by a blinded investigator. The patients were asked to score their satisfaction level at 2, 12, 24 h after intervention.

Statistical analysis

All statistical analyses were performed using SPSS 16.0 statistical software package (SPSS, Chicago, IL, USA). Results from continuous measurement data were expressed as mean ± standard deviation (SD). The Chi-square test was used to compare differences between categorical variables, whereas the Student's t-tests and One-way ANOVA analyses were used to compare differences between categorical variables. A P value of <0.05 would be regarded as statistically significant, with all the comparison two-tailed.

Results

The demographic characteristics of participants in this study were recorded in **Table 1**. There was no significant difference on these

Table 2. The satisfaction scores in groups

Variables	Acupressure group	Music group	Combination group	Control	P value
VAS-S (2 h)	8.2±1.0	8.3±0.9	8.3±0.8	4.9±0.9	>0.05
VAS-S (12 h)	8.4±0.7	8.6±0.6	8.9±0.9	5.7±1.0	>0.05
VAS-S (24 h)	8.1±1.2	8.2±1.3	8.4±0.8	5.5±1.0	>0.05

VAS-S: Visual Analog scale-Satisfaction. *P* value represents the significance level of the *t* test versus control group.

demographic characteristics among the groups (all *P*>0.05), indicating the utility for comparable results.

As shown in **Figure 1**, the scores of VAS-A in acupressure group at 1, 4, 8 h were significantly decreased than control (all *P*<0.05). Also, the VAS-A scores in patients received music treatments were significantly lower than that in control through the therapy (all *P*<0.05), suggesting music therapy could significantly reduce maternal anxiety levels. Similarly, the combination therapy group also exhibited lower VAS-A scores than control from 1 to 24 h (all *P*<0.05). It was observed that the VAS-A of music group at 1, 4 h were remarkably higher than acupressure group and combination group (all *P*<0.05).

The results of VAS-P were illustrated in **Figure 2**. The VAS-P scores in music, acupressure, and combination group were significantly decreased than control (all *P*<0.05), indicating the effects on relieving labor pain intensity by interventions. Moreover, it was found that the value of VAS-P at 1, 4 and 8 h from acupressure and combination group were statistically lower than the group received music treatment (all *P*<0.05).

The satisfaction rate of women during child birth was also evaluated by VAS. The intervention groups, including patients received acupressure, music and combination treatment, had significantly higher VAS-S score than control at postpartum 2 h, 12 h and 24 h respectively (all *P*<0.05). Furthermore, no significant difference was found among acupressure treatment group, music therapy group and combination group (all *P*>0.05). The details of satisfaction rate were listed in **Table 2**.

Discussion

As the stress and harm brought by labor pain in childbirth, more and more women receive effective management for alleviating labor pain. The frequently-used strategies for relieving pain in labor are divided into pharmacological and non-pharmacological methods, which were largely associated with the maternal and infant birth outcomes [18]. The pharmacological method for relieving pain was really effective and obtained high overall maternal satisfaction, such as remifentanil and ropivacaine [19, 20]. However, part of women prefer non-pharmacological ways for pain relief rather pharm analgesics due to cultural perspectives and the uncertain safety of pharmacological interventions [21]. Previous studies showed that non-pharmacological approaches used in clinic provided significant benefits to parturients and their infants without additional harm, contributing to the development of complementary treatments for relieving labor pain [22]. However, the effectiveness of non-pharmacological labor analgesic interventions remains to be further investigated [23].

Belonging to the non-invasive management of pain relief, acupressure and music treatment might be effective strategies for the management of multiple pains, including low back pain, chronic headache, traumatic pain, and labor pain [14, 24]. Dabiri performed acupressure on LI4 point in the first stage of labor, while another study conducted SP6 acupressure on labor pain relief, and the results showed acupressure was effective in relieving labor pain [25, 26]. Moreover, other studies showed that acupressure on BL32 acupoint was efficient on reducing the level of anxiety and the intensity of pain during labor [27, 28]. Hajiamini compared the effects of Hegupoint acupressure and ice massage on labor pain reduction, suggesting both techniques could reduce labor pain and ice massage provided more persistent pain relief [16]. Different acupressure points could reduce the pain during labor, and the efficacy of acupressure may be influenced by the selected points. Thus, the effects of acupressure points on relieving labor pain are required to be further studied to uncover the most effective points. Furthermore, the persistent time of acupressure may also affect the pain relieving efficacy. Based on the same Hegu acupressure point, we found that the continuous acupres-

sure during the childbirth period could noticeably decrease the VAS-P scores than control, revealing greater labor pain intensity reduction than a previous study [16].

Meanwhile, multiple studies investigated the effects of music therapy during childbirth. In a trial conducted on Taiwanese first-time mothers, the authors revealed that listening music could significantly reduce labor pain and anxiety during the latent phase of labor [29]. Soft music could be provided when women suffer from labor pain and strong contractions [30]. The results from other studies implied that music therapy not only reduced labor pain and anxiety, but also increased the satisfaction during childbirth, affecting various maternal-fetal parameters [17, 31]. However, Taghinejad et al. found massage was more effective for reducing labor pain compared with music therapy [32].

In the present study, the significantly decreased VAS-A in music therapy group than that in control group through the management indicated that music therapy was effective at reducing anxiety levels of parturients during childbirth. In addition, the VAS-A scores of acupressure group at 1 h and 4 h were lower than music group and no significant difference was found between acupressure group and control in VAS-A. It may be explained that acupressure could decrease anxiety levels quickly, while the effect of acupressure on relieving anxiety reduced for women accustomed to acupressure. The soft music could reduce the sensation and distress of pain on laboring women according to previous studies. Therefore, the music therapy was better at reducing anxiety levels during labor than acupressure treatment. Moreover, the laboring women in combination group, who received acupressure and listening music, showed less anxiety than control during intervention. The labor pain at 1 h and 4 h from acupressure group and combination group reduced significantly greater than music group. The combination treatment that combines acupressure and music showed more effective effects on relieving labor pain.

Taken together, acupressure and music were both effective treatments to relieve suffering during childbirth. Acupressure was more effective at decreasing labor pain intensity, while listening music could relieve pautrients anxiety

levels. Our study suggested that the intervention that combines acupressure and listening music was an effective approach to reduce laboring women suffering during childbirth. The combination intervention exerts the advantages of two single methods in alleviating labor pain intensity and anxiety levels safely and effectively. It could be recommended as an alternative therapy for pain relief and maternal mental health in labor.

Disclosure of conflict of interest

None.

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