Special Topic Study

Effects of auricular point sticking on labor pain and anxiety

耳穴贴压对分娩疼痛和焦虑的影响

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Abstract
Objective: To observe the effects of auricular point sticking on pain and anxiety during the latent period of the first stage of labor in primiparas.
Methods: Primiparas meeting eligibility criteria were recruited. The participants were randomized into an auricular point group, a placebo group, and a control group. The control group received daily care. The auricular point group received 120 min of auricular point sticking therapy. The placebo group received the same auricular plasters as the auricular point group but without pressing. Participants' pain, anxiety, and uterine contractions were measured at enrollment and 30, 60, and 120 min of interventions.
Results: Data from 78 participants were analyzed in this study. After uterine contraction was adjusted as a covariate, there was no significant difference among groups in the baseline anxiety, baseline pain, and anxiety at 30-min intervention ($P>0.05$), and no significant difference between the placebo group and the control group in each indicator at each time point ($P>0.05$). The anxiety scores of the auricular point group at 60 min and 120 min were lower than those of the placebo group and the control group ($P<0.05$). The pain in the auricular point group was less than that in the placebo group and the control group at 30, 60, and 120 min of interventions ($P<0.05$).
Conclusion: Auricular point sticking therapy can relieve anxiety and pain in women during the latent period of labor. Moreover, the effect is fast-acting. It can be used as a safe and effective complementary therapy.
Keywords: Auriculotherapy; Auricular Point Sticking; Labor Pain; Anxiety; Labor Stage, First; Primiparas

【摘要】目的: 观察耳穴贴压疗法对初产妇第一产程潜伏期疼痛和焦虑的影响。方法: 招募符合资格标准的初产妇。参与者被随机分为耳穴组、安慰剂组和对照组。对照组接受日常护理。耳穴组接受120 min的耳穴贴压治疗。安慰剂组接受与耳穴组相同的耳穴贴片, 但不进行按压。在干预前及干预30、60和120 min时测量参与者的疼痛、焦虑和子宫收缩情况。结果: 本研究分析了78名参与者的数据。将子宫收缩调整为协变量后, 组间的基线焦虑、基线疼痛和30 min时焦虑差异无统计学意义($P>0.05$), 安慰剂组与对照组各时间点各项指标差异均无统计学意义($P>0.05$)。耳穴组在60 min和120 min时的焦虑评分低于安慰剂组和对照组($P<0.05$)。在30、60和120 min时, 耳穴组的疼痛感均低于安慰剂组和对照组($P<0.05$)。结论: 耳穴贴压疗法可减轻女性分娩潜伏期的焦虑和疼痛, 且起效迅速。可作为分娩潜伏期一种安全有效的辅助疗法。

【关键词】耳针疗法; 耳穴贴压; 产痛; 焦虑; 产程, 第一; 初产妇
【中图分类号】R246.3 【文献标志码】A

Childbirth is a transformative and pivotal experience for women. However, the experience of labor pain and anxiety can be a significant challenge for them[1]. While drug analgesia is commonly used to alleviate labor pain, its side effects and invasiveness have raised concerns[2]. Additionally, women often experience significant pain before receiving drug analgesia, and some continue to experience pain even after using medications[3-4]. As a result, there is growing interest in non-pharmacological interventions that are less invasive and more patient-centered. Acupuncture therapy, an ancient technique that has been used to treat various ailments for over 2 000 years, is one such treatment.

Auricular point therapy, a form of acupuncture, has been gaining popularity as a non-invasive and effective complementary therapy for pain management. It involves stimulating specific points on the ear using various techniques such as needle embedding, ear pressure probes, and auricular point sticking. Auricular acupuncture is a fusion of traditional Chinese and Western medicine and has been widely used to treat headaches, heart pain, dysmenorrhea, low back pain,

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and skin and muscle pain[5-9]. Among various techniques, auricular point sticking is the most common one due to its safety and ease of use. It is a method of sticking a small piece of waterproof adhesive tape on the patient's auricular point with a small object of about 2 mm (such as plant seeds or magnetic metal balls) to produce an acupuncture-like effect[10].

The latent phase of labor refers to the period from the onset of labor until cervical dilation reaches 6 cm. This phase can last up to 20 h for primiparous women[11]. It is a crucial stage that significantly impacts the psychological and physiological aspects of childbirth. Severe pain and anxiety during this phase can lead to a range of complications, including prolonged labor, instrumental deliveries, abnormal fetal heart rate patterns, and neonatal hospitalization[12]. Although previous studies have explored the effects of auricular point therapy during the active phase of labor, there is limited research on its efficacy during the latent phase[13-15].

Therefore, this study aimed to investigate the effects of auricular point sticking on the pain and anxiety of primiparous women during the latent phase of labor. The results of this study could contribute to the development of more patient-centered and effective complementary therapies for labor pain management. Additionally, the findings of this study could provide insights into the appropriate timing of clinical applications of auricular point therapy in labor and delivery settings.

1 Clinical Data

1.1 Diagnostic criteria

Labor pain is a multifaceted experience that differs from acute or chronic pain, occurring during labor due to various factors, including cervical dilation, uterine contractions, and fetal descent[16]. The intensity of labor pain can range from mild discomfort to excruciating pain and can be affected by emotional, psychological, and cultural factors. Besides the typical signs of pain, such as facial expressions, guarding behaviors, and increased heart rate and blood pressure, labor pain is also characterized by uterine contractions, nausea, changes in muscle tone throughout the body, alterations in neuroendocrine function, and changes in urination function.

1.2 Inclusion criteria

Primiparous women aged between 18 and 35 years who had undergone routine prenatal examinations, with a single live birth in the head position, at term, and with cervical dilation of 2-3 cm. Additionally, participants had to voluntarily choose vaginal trial labor.

1.3 Exclusion criteria

Participants who had received sedatives before entering the delivery room or any form of analgesia other than auricular point sticking immediately after entering the delivery room were excluded. Participants with serious underlying conditions, such as heart diseases, mental disorders, and cancer, as well as those with deformity or skin damage to the pinna, were also excluded.

1.4 Withdrawal criteria

Participants who received any form of analgesia other than auricular point sticking, experienced fetal distress, required transfer to cesarean section, or experienced acute labor within 2 h after the intervention were considered dropouts.

1.5 Statistical methods

1.5.1 Sample size

Sample size calculations were performed to control the effect of uterine contractions on the results in the analysis of covariance models and to compare pain and anxiety levels among the three groups. The effect size calculation was based on the mean variable estimates for pain and the mean square standard deviation of the model error, resulting in an effect size of $f=0.36$[1,17]. A significance level of 5% and test power of 80% were assumed in the sample calculation, resulting in a sample size of 26 participants per group. A predicted loss of 10% was also taken into account, producing a final total sample of 87 participants.

1.5.2 Statistical analysis

Qualitative data were analyzed using the Chi-square test, with results presented as proportions or ratios. Quantitative data, following a normal distribution, were expressed as mean ± standard deviation ($\bar{x} \pm s$) and 95% confidence interval and subjected to one-way analysis of variance. In the case of significant differences, additional comparisons were performed using the least significant difference method. Statistical analysis was conducted using repeated measures analysis of variance. The Kruskal-Wallis non-parametric test was employed for data that did not conform to a normal distribution. Statistical significance was set at $P<0.05$.

1.6 General data

This study was a three-arm, single-blind, randomized controlled trial conducted in the delivery ward of a general tertiary hospital in southern China. Block randomization with a block length of 4 was performed by statisticians who were not involved in the study design or data collection using SAS software version 9.4. After randomly assigning 87 pregnant women to three groups, the random number and group information were placed in a sealed opaque envelope with a serial number. Convenience sampling was used to recruit pregnant women who were entering the delivery room, and the intervention midwives opened the envelopes one by one to obtain the participants' group information. Participants and outcome assessors were blinded to group assignments.

Between October 1, 2022 and February 22, 2023, 99 primiparous women were conveniently sampled, and 87 pregnant women were eligible and agreed to participate, with 29 in each group. Four participants in the auricular point group, 2 in the placebo group, and 3 in the control group withdrew due to epidural analgesia within 2 h or conversion to cesarean section (Figure 1). Data from the 78 participants were finally analyzed.

None of the three groups of participants included in the analysis reported any religious affiliation. Demographic and obstetric data did not differ significantly among the three groups, including educational attainment, maternal age, body mass index, gestational age, neonatal birth weight, and neonatal 1-min and 5-min Apgar scores ($P>0.05$). See Table 1.
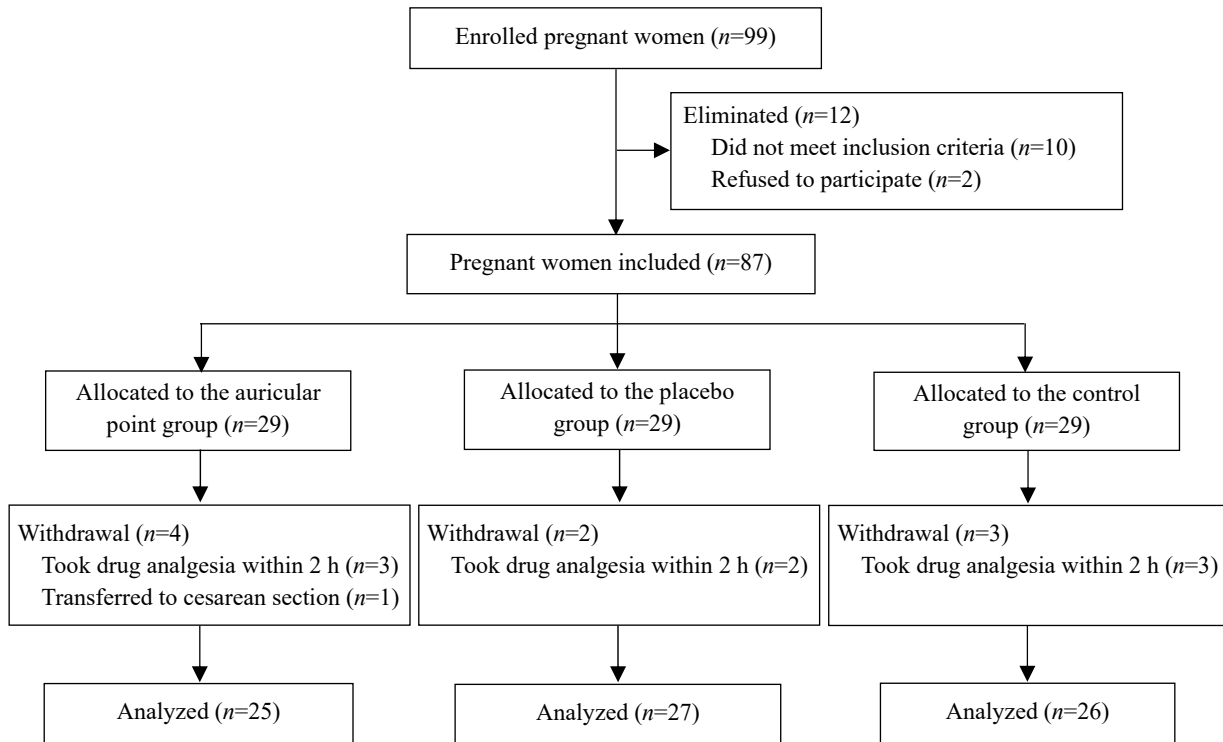

Figure 1 Flow chart of the study

Table 1 Demographic characteristics of the three groups

Group	n	Maternal age/year ($\overline{x} \pm s$)	Body mass index/(kg·m^{-2}) ($\overline{x} \pm s$)	Gestational age/week ($\overline{x} \pm s$)	Education/case Below bachelor	Education/case Bachelor and above	Newborn weight/g ($\overline{x} \pm s$)	Neonatal Apgar score/point ($\overline{x} \pm s$) 1 min	Neonatal Apgar score/point ($\overline{x} \pm s$) 5 min
Auricular point	25	27.60±3.07	28.18±3.51	39.86±1.04	13	12	3 320.00±371.09	8.92±0.28	9.88±0.44
Placebo	27	27.52±3.90	27.16±2.89	39.67±1.04	12	15	3 303.70±418.77	8.70±0.82	9.67±1.04
Control	26	27.46±3.24	28.12±3.73	40.04±0.87	14	12	3 315.38±359.94	8.88±0.33	9.85±0.46
Statistical value		0.010[1]	0.755[1]	1.237[3]	0.527[2]		0.013[1]	1.420[3]	-0.615[3]
P-value		0.990	0.473	0.539	0.768		0.988	0.492	0.735

Note: 1) Analysis of variance; 2) χ^2 test; 3) Kruskal-Wallis test.

2 Treatment Methods

2.1 Operation training for intervention personnel

Licensed traditional Chinese medicine (TCM) practitioners provided hands-on training for midwives. After reviewing the literature and consulting with experts, 4 auricular points, the Internal Genitals (TF$_2$),

Shenmen (TF$_4$), Jiaowozhong (TF$_3$), and Endocrine (CO$_{18}$), were selected. TCM physicians taught midwives the skills of correct point selection, accurate locating, correct pressing, and removal of adhesions through video explanations on the auricular point diagram, on-site demonstration operations, and exercises. Midwives underwent training and, within one week, practiced

independently. Subsequently, they received on-site evaluations by experienced Chinese medicine practitioners. Only those who successfully passed the midwife exam were eligible to participate in the study.

When the pregnant woman's cervix was dilated by 2 cm, she would routinely enter the delivery room from the obstetrics ward to wait for delivery. The midwives in the delivery room screened the preliminary qualifications of potential participants and explained the purpose of the study and the data collection procedures to eligible pregnant women. After obtaining signed consent from the participants, general demographic information collection and baseline measurements were completed.

2.2 Control group

The midwives provided participants with psychological reassurance, an introduction to the labor process, and routine obstetric care. All participants received full midwife attendance and were managed according to the same labor standards.

2.3 Auricular point group

Participants received auricular point sticking therapy based on the treatment in the control group. Auricular point location and pressing were carried out while the pregnant woman was sitting or lying down. The auricular points selected were the Internal Genitalia (TF$_2$), Shenmen (TF$_4$), Jiaowozhong (TF$_3$), and Endocrine (CO$_{18}$). See Figure 2.

First, the midwife gently pulled the auricle of the pregnant woman with the thumb and forefinger when the pregnant woman was in a calm state. Under sufficient natural light, the auricle was checked from the inside to the outside and from top to bottom for deformities or skin damage, dirt, and oil. The ears were cleaned with 75% alcohol. Then, the midwife held the auricular point probe like a pen or pencil and gently pressed the probe tip onto the skin of the point, referring to the auricular point diagram, then moved the probe around until the pregnant woman felt slight tenderness or soreness. After finding the auricular point, pressed the probe onto the point, or gently rotated it to elicit a sore stimulation response. Then, the positions of the 4 points were recorded. The midwife picked up a *Wang Bu Liu Xing (Semen Vaccariae)* with tweezers and put it on the auricular point. The seed was gently pressed down on with fingers or the end of tweezers to hold it in place. Afterward, the adhesive tape was smoothed around the seed and stuck to the skin. Acupressure was then applied. The midwife taught the pregnant woman to use the thumb and index finger to pinch the two sides of the auricle or use the index finger to lightly press the auricular point from the inside of the auricle. The pressure ranged from light to heavy, making them feel sore, numb, swollen, slightly painful, and hot. The patient was instructed to press lightly for about 30 s at a frequency of once a second each time the uterine contraction came and stopped when the uterine contraction was relieved. Auricular seeds were retained for at least 120 min and removed before the mother left the delivery room.

2.4 Placebo group

The placebo group was given *Wang Bu Liu Xing* of the same shape and amount but only fixed on the auricular points without pressure. Other treatments and nursing were the same as those in the auricular point group and the control group.
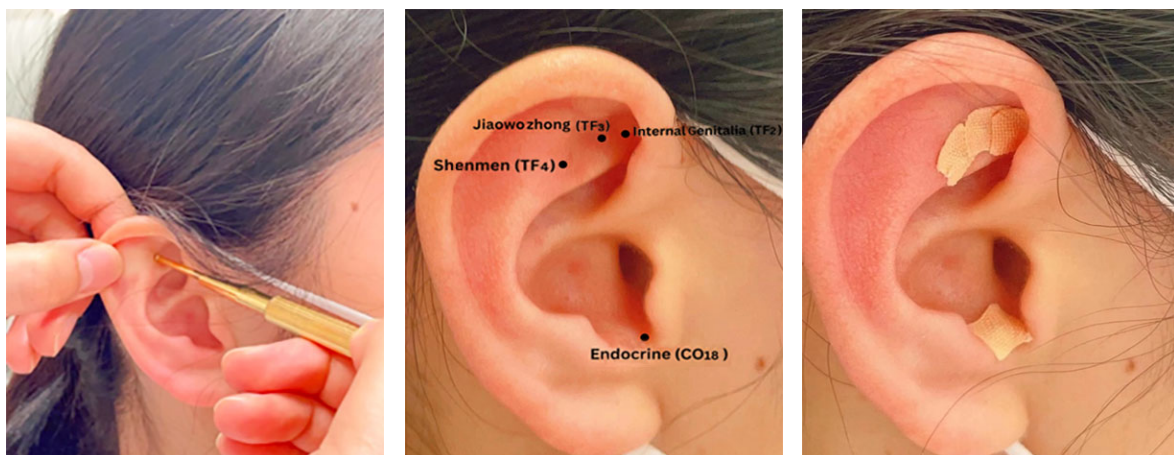

Figure 2 Exploration and positioning of the four auricular points

3 Results Observation

After baseline measurements, the pregnant women underwent repeated measurements of pain, anxiety, and uterine contractions at 30, 60, and 120 min of interventions. The three groups underwent the same pre-intervention and post-intervention measurements. Women in the auricular point group and the placebo group who delivered vaginally were asked to complete an open-ended questionnaire about their perceptions of the auricular point sticking therapy within 2 h of delivery.

3.1 Observation items

3.1.1 Demographic data

Demographic data, encompassing fetal gestational age, maternal age, real-time body mass index of expectant mothers, their educational background, and religious affiliations, were collected upon the participants' enrollment. Data related to newborn weight and Apgar scores at 1 min and 5 min were recorded within 2 h post-partum.

3.1.2 Pain and anxiety assessment

The visual analog scale (VAS) was employed to evaluate pain and anxiety levels. VAS score, ranging from 0 to 10, signified the absence of pain or anxiety at 0 and the most intense imaginable pain or anxiety at 10[18-20]. Participants were instructed to denote their level of pain or anxiety at multiple time points, which included assessments conducted prior to intervention and at 30, 60, and 120 min of interventions.

3.1.3 Montevideo units (MU) for uterine contractions

MU values for uterine contractions were calculated based on the Caldeyro-Barcia method using the formula: MU value = Intrauterine pressure × Number of uterine contractions within a 10-min interval[21]. Intrauterine pressure and the frequency of uterine contractions were measured and monitored utilizing the Philips fetal heart rate monitor, and the instrumentation was calibrated and evaluated by certified technicians. The MU value reflects the intensity of uterine contractions. Measurements were taken at distinct time points, including prior to intervention and at 30, 60, and 120 min of interventions.

3.2 Efficacy criteria

Markedly effective: The pain and anxiety during the incubation period of childbirth were significantly relieved.

Effective: The latent labor pain and anxiety were slightly relieved.

Invalid: Pain and anxiety during the incubation period of labor were not relieved.

3.3 Results

3.3.1 Comparison of the total effective rate

In this study, there were 4 participants in the control group, 4 participants in the auricular point group, and 3 participants in the placebo group who were transferred to the operating room for cesarean section after the intervention. Therefore, within 2 h post-delivery, interviews were conducted with 22, 21, and 24 participants from the control group, auricular point group, and placebo group, respectively, in the delivery room to assess their treatment experiences. Following the completion of treatment, the total effective rate in the auricular point group was 90.5%, while it was 16.7% in the placebo group. This indicates that during the incubation period of childbirth, the auricular point group demonstrated a significantly higher effective rate in relieving pain and anxiety when compared with the placebo group (Table 2).

Table 2 Comparison of the total effective rate among the three groups Unit: case

Group	n	Markedly effective	Effective	Invalid	Total effective rate/%
Auricular point	21	17	2	2	90.5[1)2)]
Placebo	24	0	4	20	16.7
Control	22	0	3	19	13.6

Note: Compared with the placebo group, 1) $P<0.01$; compared with the control group, 2) $P<0.01$.

3.3.2 Comparison of the VAS for pain (VASP) and VAS for anxiety (VASA) scores

The average predicted values of VASP and VASA of the three groups at the pre-intervention and 30, 60, and 120 min of interventions were compared. The effects of uterine contraction as a covariate on the dependent variable were all significant, but there was no significant group interaction. The data in each group met the homogeneity of variance. Table 3 and Table 4 present the mean anxiety levels and mean pain levels for each group at different time points after adjustment. Through further pairwise comparisons of the study groups, we observed that there was no statistically significant difference in anxiety levels among the three groups at the pre-intervention and 30-min intervention time points (Table 5). However, at the 60-min and 120-min intervention time points, significant differences were noted among the three groups. Specifically, when compared with the control group, the auricular point group showed a significant reduction in the anxiety level ($P<0.05$). Furthermore, when compared with the placebo group, the auricular point group also exhibited a significant decrease in the anxiety level ($P<0.05$). See Table 5. It is worth noting that there were no statistically significant differences in the anxiety level between the placebo group and the control group at each time point.

Additionally, at the pre-intervention time point, there were no statistically significant differences in the pain level among the three groups. However, at the 30, 60, and 120 min of intervention time points, significant differences were observed among the three groups. In particular, the auricular point group demonstrated a significant reduction in the pain level when compared with the control group ($P<0.05$). Similarly, when

compared with the placebo group, the auricular point group displayed a significant decrease in the pain level ($P<0.05$). See Table 6. Nonetheless, it is important to emphasize that there were no statistically significant differences in the pain level between the placebo group and the control group at each time point.

3.3.3 Comparison of the uterine contraction, VASP and VASA scores fluctuating with the progress of labor

The uterine contractions at pre-intervention and 30, 60, and 120 min of interventions of the three groups increased significantly with time ($P<0.001$). However, there was no interaction between time and group, indicating that there was no significant difference in uterine contraction fluctuation among groups (Figure 3). After controlling the covariate of pre-intervention uterine contraction, anxiety and pain in the repeated measurements of the three groups fluctuated significantly over time ($P<0.001$), and there was a significant interaction between time and group, indicating that there was a significant difference in the fluctuations of anxiety and pain among groups (Figure 4 and Figure 5).

Table 3 Anxiety scores of the study groups

Time point	Group	Mean[1]	Standard error	95% confidence interval
Pre-intervention	AG (*n*=25)	5.397	0.368	(4.664, 6.130)
	PG (*n*=27)	4.988	0.354	(4.282, 5.693)
	CG (*n*=26)	5.323	0.361	(4.604, 6.042)
30-min intervention	AG (*n*=25)	4.654	0.333	(3.991, 5.318)
	PG (*n*=27)	4.672	0.321	(4.032, 5.312)
	CG (*n*=26)	5.403	0.328	(4.750, 6.056)
60-min intervention	AG (*n*=25)	4.880	0.357	(4.169, 5.591)
	PG (*n*=27)	5.918	0.344	(5.233, 6.603)
	CG (*n*=26)	6.354	0.350	(5.657, 7.051)
120-min intervention	AG (*n*=25)	4.881	0.363	(4.158, 5.603)
	PG (*n*=27)	6.333	0.349	(5.638,7.027)
	CG (*n*=26)	6.654	0.356	(5.945, 7.362)

Note: AG=Auricular point group; PG=Placebo group; CG=Control group; 1) the model added uterine contraction covariate.

Table 4 Pain scores of the study groups

Time point	Group	Mean[1]	Standard error	95% confidence interval
Pre-intervention	AG (*n*=25)	5.715	0.175	(5.366, 6.064)
	PG (*n*=27)	5.935	0.169	(5.599, 6.271)
	CG (*n*=26)	5.919	0.172	(5.576, 6.261)
30-min intervention	AG (*n*=25)	4.544	0.181	(4.184, 4.905)
	PG (*n*=27)	6.246	0.175	(5.898, 6.594)
	CG (*n*=26)	6.259	0.178	(5.904, 6.614)
60-min intervention	AG (*n*=25)	5.932	0.143	(5.646, 6.218)
	PG (*n*=27)	7.373	0.138	(7.097, 7.648)
	CG (*n*=26)	7.333	0.141	(7.052, 7.613)
120-min intervention	AG (*n*=25)	7.215	0.144	(6.928, 7.503)
	PG (*n*=27)	8.147	0.139	(7.870, 8.424)
	CG (*n*=26)	8.140	0.142	(7.858, 8.422)

Note: AG=Auricular point group; PG=Placebo group; CG=Control group; 1) the model added uterine contraction covariate.

Table 5 Anxiety scores pairwise comparisons of the study groups

Time point	Group[1]	Group[2]	Mean difference[3]	Standard error	*P*-value
Pre-intervention	CG (*n*=26)	AG (*n*=25)	-0.074	0.515	0.886
	CG (*n*=26)	PG (*n*=27)	0.335	0.506	0.509
	AG (*n*=25)	PG (*n*=27)	0.409	0.511	0.425
30-min intervention	CG (*n*=26)	AG (*n*=25)	0.749	0.467	0.113
	CG (*n*=26)	PG (*n*=27)	0.731	0.460	0.117
	AG (*n*=25)	PG (*n*=27)	-0.018	0.462	0.969
60-min intervention	CG (*n*=26)	AG (*n*=25)	1.474	0.499	0.004
	CG (*n*=26)	PG (*n*=27)	0.436	0.491	0.377
	AG (*n*=25)	PG (*n*=27)	-1.038	0.496	0.040
120-min intervention	CG (*n*=26)	AG (*n*=25)	1.773	0.508	0.001
	CG (*n*=26)	PG (*n*=27)	0.321	0.498	0.521
	AG (*n*=25)	PG (*n*=27)	-1.452	0.503	0.005

Note: 1) Group in the second column; 2) Group in the third column; 3) Group in the second column minus group in the third column; AG=Auricular point group; PG=Placebo group; CG=Control group.

Table 6 Pain scores pairwise comparisons of the study groups

Time point	Group[1]	Group[2]	Mean difference[3]	Standard error	*P*-value
Pre-intervention	CG (*n*=26)	AG (*n*=25)	0.204	0.245	0.409
	CG (*n*=26)	PG (*n*=27)	-0.017	0.241	0.945
	AG (*n*=25)	PG (*n*=27)	-0.220	0.243	0.368
30-min intervention	CG (*n*=26)	AG (*n*=25)	1.715	0.254	<0.001
	CG (*n*=26)	PG (*n*=27)	0.013	0.250	0.959
	AG (*n*=25)	PG (*n*=27)	-1.702	0.251	<0.001
60-min intervention	CG (*n*=26)	AG (*n*=25)	1.401	0.201	<0.001
	CG (*n*=26)	PG (*n*=27)	-0.040	0.197	0.840
	AG (*n*=25)	PG (*n*=27)	-1.441	0.199	<0.001
120-min intervention	CG (*n*=26)	AG (*n*=25)	0.925	0.202	<0.001
	CG (*n*=26)	PG (*n*=27)	-0.007	0.198	0.973
	AG (*n*=25)	PG (*n*=27)	-0.932	0.200	<0.001

Note: 1) Group in the second column; 2) Group in the third column; 3) Group in the second column minus group in the third column; AG=Auricular point group; PG=Placebo group; CG=Control group.
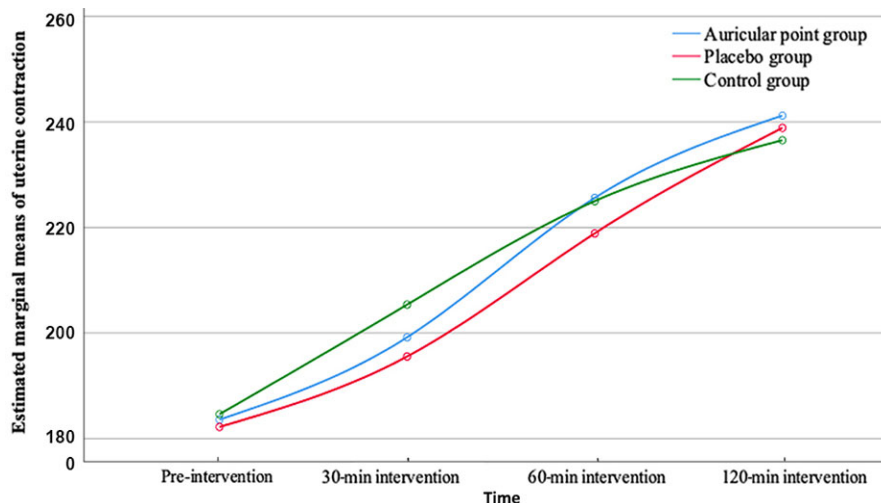
Figure 3 Estimated value of uterine contraction of the study groups
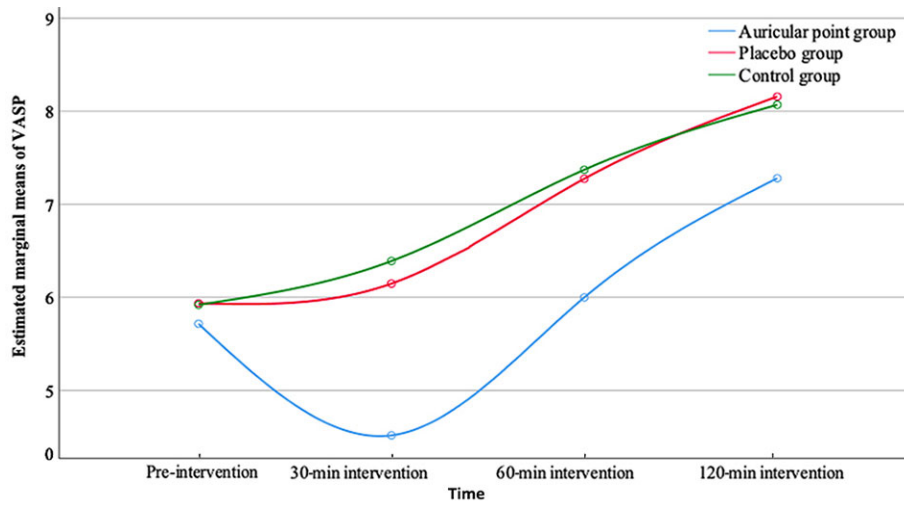
Note: Covariates appearing in the model are evaluated at the value of baseline contraction=183.46.

Figure 4 Estimated value of visual analog scale for pain of the study groups
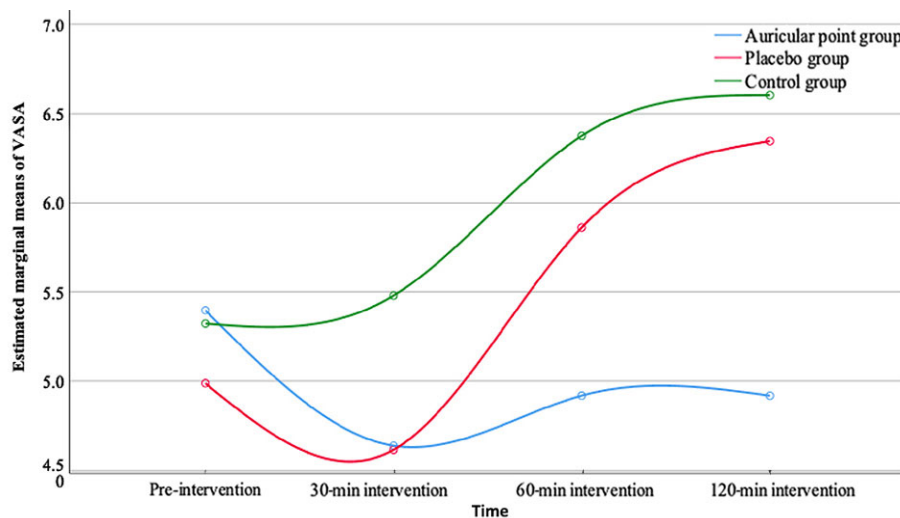
Note: Covariates appearing in the model are evaluated at the value of baseline contraction=183.46.

Figure 5 Estimated value of visual analog scale for anxiety of the study groups

4 Discussion

This study found that auricular point sticking did not significantly affect childbirth anxiety within the first 30 min during the latent period of the first stage of labor. However, it could continuously and stably relieve childbirth anxiety in the next three 30 min. Research has shown that labor anxiety is often related to a lack of information about pregnancy and delivery and may also arise from new and unknown conditions, such as greater-than-expected pain[22]. Although the control group and the placebo group in this study did not receive auricular therapy during the first 30 min, they received psychological comfort and the introduction of delivery procedures. These interventions may have effectively relieved pregnant women in the latent period with relatively low-intensity pain and anxiety. It may explain why there is no significant difference in the anxiety level during the first 30 min among the three groups. We did not find auricular treatment research specifically for pregnant women in the latent period. However, a study from Iran evaluated the effect of stimulating auricular Shenmen (TF$_4$), Brain Stem (AT$_{3,4i}$), and other points on labor anxiety in the active period. The results were consistent with this study[13]. A study in Brazil stimulated auricular points Shenmen (TF4), Chuiqian (LO$_4$), Internal Genitalia (TF$_2$), and Endocrine (CO$_{18}$), concluding that it can effectively relieve anxiety during active labor[14]. Although the combinations of auricular points the researchers chose varied, they all included Shenmen (TF$_4$), which is believed to have a calming effect. In addition, research has shown that labor anxiety and pain are reciprocal and jointly affect maternal and fetal health. The anxiety-relieving effect of auricular pressing is likely to be influenced by pain relief. Therefore, evaluating the clinical significance of

auricular point sticking for pregnant women during the latent period of the first stage of labor must integrate both pain and anxiety.

This study found that the auricular point sticking method was effective for labor pain and had the best efficacy during the first 30 min. Then as the uterine contraction intensified, although the analgesic effect continued, the effect size gradually decreased. An extensive review analysis found that 92% of 27 studies focusing on auricular acupressure for acute pain showed effectiveness[23]. A meta-analysis of 5 randomized controlled trials also showed that labor pain scores were significantly lower in the auricular massage group than in the usual care group at cervix dilation of 6, 8, and 10 cm[15]. Although this study focused on pregnant women during the incubation, the findings are consistent with previous conclusions. Notably, most nociceptive stimuli during labor latency are attributed to cervical ripening and dilation of the lower uterine segment. Increased prostaglandin synthesis during this period softens the cervix while producing more intense contractions, which is thought to be a common mechanism of dysmenorrhea and labor pain[24]. Auricular point massage is effective in treating dysmenorrhea[25]. The interviews with postpartum women in the auricular point group also found that the patients often reported that the cramping pain in the lower abdomen shortened or disappeared. This mitigative effect appeared almost shortly after the auricular point pressing started. The meridian theory of TCM believes that the auricles are directly or indirectly connected to the 12 meridians of the whole body, involving the viscera and endocrine-related areas innervated by the points of the limbs and the vagus nerve, such as the auricular point Internal Genitalia (TF$_2$), corresponding to the organs and functions of the upper reproductive tract, including the hypothalamus-pituitary-ovary axis[26], and Shenmen (TF$_4$), corresponding to the function of the vagus nervous system[27]. The neurohumoral theory of modern medicine believes that stimulation such as acupuncture or electroacupuncture works through the regulation and integration of the neuroendocrine-immune network system in the body[28]. Whether based on the reflex theory of Western medicine or the balance of Yin and Yang theory of TCM, the stimulation and response occur immediately, and the effect continues.

Therefore, based on the above theories, this study speculates that auricular point pressing can relieve the pain and anxiety of pregnant women during the incubation period. This pain relief effect appears quickly and can be maintained as uterine contractions increase. Clinical midwives can provide auricular point sticking therapy for pregnant women in the latent period of

labor, hoping to reduce labor pain and anxiety effectively.

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