

## Effectiveness of acupuncture versus spinal-epidural anesthesia on labor pain: a randomized controlled trial

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### Abstract

**OBJECTIVE:** To evaluate the effectiveness of acupuncture analgesia (AA) compared with combined spinal-epidural anesthesia (CSEA) for labor pain relief and labor outcomes.

**METHODS:** We evaluated 131 primiparous women who received respiratory guidance during maternal uterine contractions and received either AA ( $n = 43$ ), CSEA ( $n = 45$ ), or no additional treatment (control,  $n = 43$ ). The groups were compared regarding visual analog scale (VAS) scores for abdominal and back pain, and labor outcomes.

**RESULTS:** The abdominal VAS scores of the AA and CSEA groups were significantly lower than that of the control group. In addition, the VAS scores of the CSEA group were significantly lower than that of the AA group at 10 and 60 min after intervention. The back pain VAS scores of the AA and CSEA groups were significantly lower than that of the control group at 5, 10, and 60 min after intervention. The duration of the active phase of labor in the CSEA group was significantly longer than that of the AA and control groups. The rates of oxytocin use (4.70%), urinary retention (4.70%), and postpartum hemorrhage [ $(273.7 \pm 53.6)$  mL] in the AA group were significantly lower than in the CSEA group [46.70%, 24.20%, and  $(320.0 \pm 85.6)$  mL, respectively].

**CONCLUSION:** Both AA and CSEA were effective for labor pain relief, CSEA provided more effective pain relief, while AA was associated with a shorter duration of labor and fewer adverse effects, and each has its advantages and disadvantages.

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**Keywords:** Anesthesia, obstetrical; Acupuncture anesthesia; Electroacupuncture; Anesthesia, conduction; Labor pain; Randomized controlled trial

### INTRODUCTION

Labor pain is severe and acute, and can be associated with adverse effects to the mother and fetus such as acidosis and fetal hypoxia.<sup>1</sup> Due to the patients' fear of labor pain, the rate of elective cesarean section has dramatically risen,<sup>2</sup> and the rate is over 50% in some re-

gions of China.<sup>3</sup> Thus, an available and safe source of pain relief is necessary and of considerable significance to parturient women. This is especially true for primiparous women, for whom the pain is often more severe than in multiparous women.

There are many pharmacological methods commonly used to reduce labor pain. Combined spinal-epidural anesthesia (CSEA) offers both a reliable spinal anesthesia and prolonged analgesic titration provided by continuous epidural anesthesia.<sup>4,5</sup> CSEA relieves the pain by blocking afferent and efferent sympathetic nerve stimulation; this reduces maternal stress and oxygen consumption, and decreases fetal distress. However, CSEA may prolong the duration of labor, particularly the active phase and second stage.<sup>6</sup> Other adverse effects associated with CSEA include maternal vomiting, hypotension, pruritus, uterine atony, fever, and urinary retention.<sup>7-12</sup> Alternatives to CSEA or complementary methods for labor analgesia include non-pharmacological methods such as breathing techniques, massage therapy, and acupuncture analgesia (AA).<sup>13,14</sup>

One alternative method commonly used to reduce labor pain is acupuncture,<sup>15</sup> which involves puncturing the skin with thin needles at acupoints. Acupuncture is based on the theory of Traditional Chinese Medicine, according to which the functioning of the body is under the control of *Qi* flowing through meridians. Although numerous acupoints can be selected as acupuncture sites for labor analgesia, the main acupoints used in most studies are Hegu (LI 4), Sanyinjiao (SP 6), and Zusanli (ST 36). In acupuncture, the needles are rotated back and forth until the De *Qi* sensation is achieved.

Although numerous studies have evaluated the effectiveness of acupuncture for labor pain relief, the results have been contradictory.<sup>16,17</sup> Some researchers reported that acupuncture could relieve labor pain,<sup>18-20</sup> while others found no difference in pain reduction relative to sham acupuncture or standard care.<sup>21-23</sup> A recent study revealed that acupuncture did not reduce labor pain, but significantly fewer women who received acupuncture combined with electrical stimulation (electroacupuncture) used epidural analgesia compared with those given manual acupuncture or standard care alone.<sup>24</sup> In addition, subcutaneous injections of sterile water into acupoints (i.e., acupoint injection) reportedly reduced the intensity of labor pain more effectively than acupuncture alone.<sup>25</sup>

The current study compared AA with CSEA and a non-treated control group with regard to the effectiveness of labor pain relief.

## MATERIALS AND METHODS

The Ethics Committee at the Third Affiliated Hospital of Sun Yat-sen University approved the present study. The study protocol conformed to the ethical guidelines

of the 1975 Declaration of Helsinki. All patients provided written informed consent.

### Patients

The 131 patients were primiparous females admitted to the Department of Obstetrics and Gynecology of the Third Affiliated Hospital of Sun Yat-sen University from April 2012 to March 2014. Included patients were all aged 21 to 31 years, with a normal singleton pregnancy and a fetus in cephalic presentation at a gestational age of 37 to 42 weeks, at 3-cm cervical dilation of labor, and without any obstetrical complications for vaginal delivery. We excluded those with scar diathesis, cesarean section, history of electroacupuncture for pain reduction, or any sign of fetal distress.

Each enrolled patient was randomly allocated to one of three groups: AA, CSEA, or control. Randomized selection was carried out by the midwife according to a random number table. The numbers 1 to 150 were randomly allocated into three envelopes that corresponded to the respective groups (AA, CSEA, and control). Each enrolled participant was then assigned a random number according to the order of delivery. After opening the envelope, the doctor talked with each participant (in all three groups) and explained the treatment that they would receive in this study. Nineteen participants were excluded from the study because they did not consent to the treatment allocation before delivery, required another method of pain relief during labor, or the active phase was less than 60 min. The final number of participants was 131 (43 in the AA group, 45 in the CSEA group, and 43 in the control group). In addition, all patients received respiratory guidance during maternal uterine contractions.

### Interventions

Acupuncture needles (0.32 mm × 25-40 mm) were purchased from Suzhou Huanqiu Acupuncture Medical Appliance (Suzhou, China) and the electroacupuncture device was purchased from Shanghai Huayi (G-6805 = 2A, Shanghai, China).

Before acupuncture administration, the clinicians washed their hands, and cleaned them and the acupoints with 75% alcohol. No inserted part of the needle body was touched during the treatment. Only one needle was used at each acupoint.

We located the acupoints by first determining the individualized *cun*, or Chinese inch, measurement for each patient. Patients were asked to keep their index finger, middle finger, ring finger, and little finger together, and we then measured the width of these four fingers as their own individual 3 *cun* at the level of transverse striation at the proximal interphalangeal joint of the middle finger. We measured the patients' bodies and located their individualized acupoints on the basis of the abovementioned *cun* measurement.

According to the National Standard of the People's Republic of China (GB12346-90), acupoint Hegu (LI 4)

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