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### ORIGINAL RESEARCH – QUANTITATIVE

## The effect of acupressure on the initiation of labor: A randomized controlled trial

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#### ABSTRACT

**Background:** Induction of labor is a common obstetric procedure. Acupressure is a natural method that is used for inducing uterine contractions. Nevertheless, few studies have examined the impact of acupressure on the induction of labor.

**Aim:** The aim of this study was to evaluate the effect of acupressure on the initiation of labor.

**Material and methods:** In this randomized clinical trial, 162 nulliparous pregnant women were admitted to the hospital. They were categorized into 3 groups; acupressure, sham acupressure and control. Acupressure points SP6, BL 60 and BL 32 were pressured bilaterally. The intervention was done by the researcher every other day between 9 am and 11 am. The intervention was carried out on women in the afternoon and the following day. Subjects were examined to determine the initiation of labor symptoms 48 and 96 h after the start of intervention and at the time of hospitalization. Data were analyzed using the ANOVA, Kruskal–Wallis and Chi-square tests ( $p < 0.05$ ).

**Results:** There was no significant difference among the groups for spontaneous initiation of labor within 48 h ( $P = 0.464$ ), and 49–96 h after beginning the intervention ( $P = 0.111$ ) and 97 h after beginning the intervention to the time of hospitalization for the spontaneous initiation of labor ( $P = 0.897$ ). There were no significant differences in the secondary outcomes between the groups.

**Conclusion:** According to the finding of this study, it seems that acupressure treatment was not effective in initiating labor as compared with the sham acupressure and the routine care groups.

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#### Summary of Relevance:

##### Problem

The use of interventions in labor has increased over the past decade. The pharmacological induction of labor increases the rate of intervention in labor and the risk of excessive uterine activity, fetal distress and cesarean birth.

##### What is already known

Within the scope of maternity care, women increasingly look forward to a natural, non-invasive intervention, to enhance their pregnancy experience and to achieve a natural birth.

##### What this paper adds

Pharmacological induction of labor is associated with adverse birth outcomes whereas non-pharmacologic methods are safe and have no side effects. This study evaluated the effect of acupressure on the initiation of labor.

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## 1. Introduction

Among most women, spontaneous labor pains start automatically in the near term and it leads to childbirth, but in some women due to medical and obstetric problems during pregnancy, cervical ripening and induction of labor before the start of spontaneous labor is necessary.<sup>1</sup>

Induction of labor, becomes necessary when the benefit of induction of labor to the mother or fetus outweigh the potential risks of continuing with the pregnancy.<sup>2,3</sup> Induction of labor is a common obstetric procedure.<sup>4–6</sup> Among common indicators for induction of labor, gestational hypertension and prolonged pregnancy are the most common indications.<sup>7</sup>

Pregnancy that extends beyond the 40th week of gestation is known to be a risk factor for maternal and neonatal mortality and morbidity.<sup>8</sup> Induction of labor is practiced to prevent these problems and improve the health outcome of mothers and infants.<sup>9</sup>

The methods of labor induction include pharmacological and non-pharmacologic methods. Pharmacologic methods include oxytocin, prostaglandins, such as misoprostol, and mechanical methods that include artificial rupture of membranes, stripping of membranes, etc.<sup>10</sup>

The main problem encountered during pharmacological induction of labor is uterine hyper-stimulation because it may cause both maternal and fetal distress, which may lead to an increased risk of cesarean birth.<sup>11,12</sup> Acupressure is a natural method of labor induction that is used for softening the cervix and inducing uterine contractions.<sup>13</sup>

The mechanism by which acupuncture and acupressure induce labor is known as the theory of uterine stimulation by hormonal changes or the nervous system. Acupuncture increases the discharge of hormones from thalamic nuclei and the hypothalamic anterior pituitary system. According to another theory, neuronal stimulation with acupuncture may increase uterine contractions either by central oxytocin discharge or by parasympathetic stimulation of the uterus.<sup>14</sup>

The study conducted by Gribble et al.<sup>15</sup> showed that acupuncture brought about induction of labor within 24 h after the application of acupuncture on the mother while the research conducted by Neri et al.<sup>13</sup> did not show any significant differences between the acupuncture group and the control group.

Based on the limited studies on the effect of acupressure on the initiation of labor and the effects of participation of pregnant women in their care process, this trial was designed to evaluate the effect of acupressure on the initiation of labor in pregnant women, who were referred to Shahid Akbar-Abadi hospital in Tehran.

## 2. Methods

### 2.1. Sample recruitment

The present study was performed in Shahid Akbar Abadi hospital in Tehran at the Iran University of Medical Sciences, between April 2015 and November 2015.

The sample size was calculated at the 5% level of significance and a power of 80% based on a pilot study ( $n = 10$  in each group). In this double-blind clinical trial, 162 pregnant women who were referred to the Shahid Akbar Abadi hospital in Tehran were enrolled by the researcher in the study. Finally, 150 mothers completed the study. After obtaining freely informed written and oral consent, pregnant women were divided into 3 groups by the researcher using a computer-randomization system. The 3 groups were acupressure ( $n = 54$ ), sham acupressure ( $n = 55$ ) and routine care ( $n = 53$ ).

### 2.2. Ethical consideration

The protocol for this study was approved by the ethics and research committee of Shahid Beheshti University of Medical Sciences (No. SBMU2.REC.1394.48, Date 8/03/2015). The trial is registered at Iranian Registry of Clinical Trials, number IRCT2015042321904N1.

After obtaining freely informed written and oral consent, pregnant women were allocated by the researcher using a computer-randomization system, in their groups. Data was preserved in lock and key, and data entry was done using password protected computers. The questionnaires included only identity codes. Participants were allowed to leave the study at any point in time.

### 2.3. Intervention

Subjects were randomized into the 'no-treatment' control group. The researcher alone was aware of the intervention group. Routine care and data collection was performed by the two research assistants (with 10 years of work experience) who were unaware of the research groups. The randomization code was only revealed after completing the clinical study.

Inclusion criteria were age 18–35 years, nulliparous, low risk pregnancy, gestational age 39–40 weeks as estimated by ultrasound before the 12th week, singleton cephalic presentation, normal BMI, Bishop score  $\leq 4$ , biophysical profile score of 8/8 and a normal amniotic fluid index, not taking herbal or chemical drugs 36 h before and up to the end of the study, and not having sexual intercourse 24 h before and up to the end of study. Exclusion criteria included taking chemical or herbal drugs, having sexual intercourse, and not doing acupressure on schedule.

The intervention groups were asked by the researcher to refer to the hospital 0/5 until 1 h after breakfast, between 9 am and 11 am for acupressure and sham acupressure. Acupressure and sham acupressure were performed by the researcher every other day between 9 am and 11 am. Acupressure and sham acupressure were performed by the mother and her participant after training. These methods were carried out between the hours of 3 and 5 pm and the following day of the intervention in the morning and afternoon. In the sham acupressure group, three ineffective acupuncture and acupressure points on the hands and legs were pressed.

In the acupressure group, bladder 32, spleen 6 and bladder 60 spots were used. Bladder 32 is located on the bladder meridian<sup>16</sup> and in the region of the sacrum, medial and inferior to the posterior superior iliac spine in the second sacral foramen, and the pressure at this point is indicated for low back pain, dysmenorrhea, irregular menstruation, pain and induction of labor.<sup>17</sup>

Spleen 6 is located on the spleen meridian<sup>16</sup> and 5 cm above the inside ankle on the Tibia, and acupressure at this point can be used to treat of dysmenorrhea, labor pain and softening the cervix.<sup>18–21</sup>

Bladder 60 is located on the bladder meridian<sup>16</sup> and at the midpoint between the prominence of the lateral malleolus and the Achilles tendon, which is pressured at this point to reduce anxiety, pain and softening the cervix.<sup>22,23</sup>

In acupressure and sham acupressure groups, pressure was applied on the points for 1 min and it was interrupted for 1 min as rest time, so that each point should be pressed 5 times. Acupressure and sham acupressure points were subjected to pressure respectively, and after the completion of acupressure and sham acupressure at each point, the next point was pressed. The total intervention time was 30 min. The routine care group also received routine healthcare services.

The bilateral method of pressure was applied on the points with appropriate force (half of the fingernails turned white) and this

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