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Investigating the Effect of Acupuncture on Facilitating Placenta and Fetus Removal in Difficult Labors

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Abstract--- *Introduction: Due to the side effects of the pharmacological methods, there is a greater tendency to use non-pharmacological methods, such as acupuncture. The objective of the present study is to investigate the effect of acupuncture on facilitation of placenta and fetus removal during difficult labors.*

Materials and Methods: *This single-blind randomized clinical trial was conducted on 60 mothers referred to maternity hospitals of Shahroud. The mothers were divided into two groups (each group included 30 mothers). The placenta and fetus were removed in the control group (control) with no intervention and normally. The times of placenta and fetus removal and postpartum pain and the studied factors were recorded. The placenta and fetus were removed in the second group (experimental group) with intervention of acupuncture since the beginning of the contractions and pain, and all stages were recorded. The data were analyzed through SPSS software.*

Results: *The results showed that the duration and level of pain in the first stage of labor and the need for labor augmentation with oxytocin in the acupuncture group were significantly less than those of the control group.*

Conclusion: *It can be concluded that acupuncture reduces the duration of labor, reduces the need for oxytocin, and reduces the level of pain in the first stage of labor. Therefore, it is recommended to encourage the mothers to have a normal vaginal delivery via acupuncture to improve the process of normal vaginal delivery and further promote the natural vaginal delivery in the community.*

Keywords: *acupuncture, placenta and fetus removal, vaginal delivery, Shahroud hospitals*.

I. INTRODUCTION

Acupuncture that is called Zhen Jiu in Chinese language relives the pain and treats a particular problem of a patient through inserting very thin needles into specific parts of the body. According to acupuncture theory, these specific points are on Meridians in which a vital energy called "qi" is flowing. Although much scientific research has been conducted on acupuncture from late 20th century, it is still unclear how it works and there is much debate on it among scientists. Reports released by the World Health Organization, the National Center for Complementary Medicine and the American Medical Association suggest the effectiveness of acupuncture in the treatment of many diseases.

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There is a general consensus among scientists that acupuncture, if done by an acupuncturist and sterile needles, is a safe method to treat some diseases (1, 2). Delivery means the complete removal of the placenta and fetus from the uterus to the environment outside the mother's body. The process of vaginal delivery is usually very difficult and painful and it makes the pregnant mothers and the delivery team to avoid this process and prefer cesarean delivery (3). The complications of cesarean delivery are twice as high as those of vaginal delivery. It also imposes high cost on the treatment sector.

Some of the complications of cesarean section delivery include increased risk of uterine infection, increased bleeding, risks associated with anesthesia, possibility of infection in suture sites, possibility of constipation due to anesthetic medications, prolonged hospital stay, pelvic pain, the incidence of blood clots in the legs or pelvis after surgery, more feeling of fatigue and drowsiness due to taking anesthetic drugs, increased risk of depression, feeling of failure, hopelessness and discouragement of the mother after delivery, possible complications and harms of anesthetic drugs on the fetus, increased possibility of respiratory problems in neonate, increased rate of neonatal mortality than the neonates born by vaginal delivery, increased risk of jaundice in neonate, increased risk of maternal stroke (4-7). Medicine has always tried to encourage mothers to have this type of delivery by facilitating vaginal delivery methods. Various pharmacological and non-pharmacological methods have been proposed including water delivery, spinal anesthesia, use of opioids, and many other methods (8). One of the methods recommended in Chinese medicine is the use of acupuncture. Some studies suggest that acupuncture is effective in facilitating delivery, and some other studies suggest that acupuncture does not have much effect on delivery (9-11). For this purpose, this study was conducted to investigate the effect of acupuncture on facilitating the placenta and fetus removal during deliveries. It was conducted on 60 patients referred to Shahrood maternity hospitals during the years 2014 to 2015. Given the low cost of acupuncture and its few side effects, it can be recommended in normal vaginal deliveries, if positive results are obtained (12-15).
In this regard, the following hypotheses are presented:
Using acupuncture reduces mothers' pain and increases their satisfaction with normal vaginal delivery.
Using acupuncture reduces the need for analgesics during labor.
Using acupuncture reduces the need for oxytocin.
Using acupuncture reduces the duration of delivery.

Methodology

The present study is a single-blind randomized clinical trial conducted on 60 mothers referring to maternity hospitals of Shahrood during a one year period (since second half of 2014 to first half of 2015). Inclusion criteria of the study included all healthy primiparous women aged 20 to 34 years with singleton pregnancies, term fetus (37 to 41 weeks), vertex presentation and no experience of TENS or previous acupuncture. Exclusion criteria of the study included multi-parity, any poor pregnancy outcomes, maternal underlying diseases such as anxiety disorder, taking antiepileptic drugs, taking sedatives, taking antidepressants, and any contraindication for spinal anesthesia and patients with a history of tension headaches, migraines, drug addiction, and patient dissatisfaction. After completing the consent form and explaining the research objectives to the subjects in the visit before the delivery, the mothers (n = 60) were randomly divided into two groups (each group included 30 mothers). The placenta and fetus were removed in the control group (control) with no intervention and normally. The times of placenta and fetus removal and postpartum pain and the studied factors were recorded. The placenta and fetus were

removed in the second group (experimental group) with intervention of acupuncture from the beginning of the contractions and pain and all stages were recorded.
Some of the investigated and recorded information included satisfaction after delivery, pain during delivery, duration of delivery, need for analgesia after delivery, etc. Maternal demographic data and level of cervical dilation were recorded at the beginning of intervention. The severity of pain and level of dilation at the beginning of the intervention were assessed by the researcher. Also, the duration of the first stage of delivery was assessed using digital clock and the need for augmentation of delivery in both groups was assessed. In the patients of experimental group, spinal anesthesia was applied after disinfecting the desired site and a 25 quinine needle was inserted into the incubated space in the middle line alongside the longitudinal axis at the level of l3 - l4 or l4 - l5 and 2 cc of Lidocaine 5% and 0.5cc of fentanyl were injected. Then, pulse pressure, rhythm and heart rate were monitored. After collecting the data, they were analyzed using descriptive statistics and t-test and Mann-Whitney tests through SPSS software at the p-value <0.05 level.

Results

According to (Table 1), the mean age was 27.6±2.1 years in the control group and 28.2±1.19 years in the experimental group. It indicates that the mean age difference in the two groups was very low. It was slightly higher in the experimental group, but this difference was not significant.

Table 1. Distribution of age frequency in two groups

	N	Mean	SD	Max	Min
Control	30	27.6	2.1	32	21
Experimental	30	28.2	1.19	31	20

According to (Table 2), the mean gestational age was 39.2 ± 0.7 in the control group and 39.0±0.6 in the experimental group. A significant difference was not observed between two groups in this regard. No significant relationship was found between the mean age of the mothers and results of acupuncture.

Table 2. Frequency distribution of gestational age in the studied patients

	N	Mean	SD	Max
Control	39.2	0.7	41	37
Experimental	39	0.6	41.5	37

According to (Table 3), the mean cervical dilation was 4.2 ± 0.4 cm in the control group and 4.3 ± 0.4 cm in the experimental group at the baseline. As shown, no significant difference was observed between two groups in this regard.

Table 3. Mean cervical dilation in two groups at baseline

	N	Mean	SD	Max	N

Control	30	4.2	0.4	4.9	3.3
Experimental	30	4.3	0.4	5.1	3.2

According to (Chart 1), out of 30 neonates born in the control group, 13 were male and 17 were female, and out of 30 neonates born in the experimental group, 14 were male, and 16 were female. No significant relationship was found between gender of the neonates and the results of acupuncture.

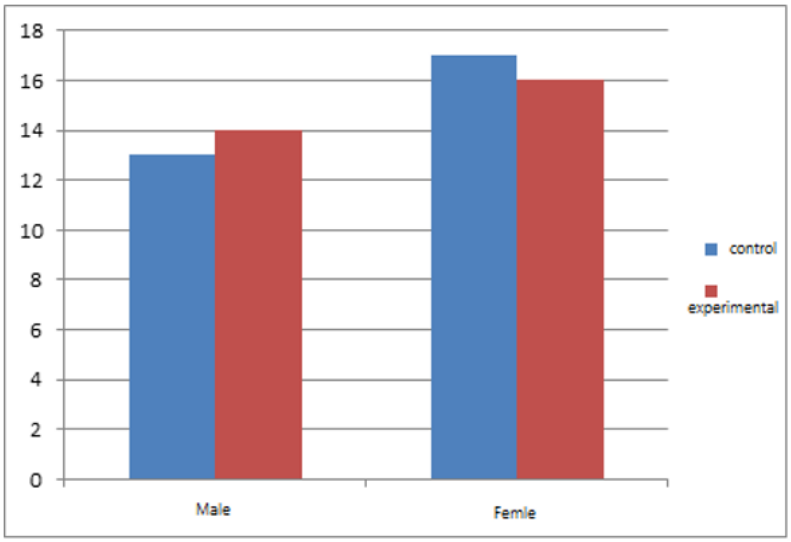

Chart 1. Gender distribution of the born neonates

According to (Table 4), the mean pain score in the two groups at the beginning of the intervention was not different. In the 6-7 cm dilation, the pain score was not statistically different in the two groups, but in the 9-10 cm dilation, it was less in the experimental group compared to the control group.

Table 4. Evaluation of mean pain in two groups in different dilations and its relationship with results of acupuncture

Pregnancy outcomes	Experimental group	Control group	p-value
Pain severity score in 4 cm dilation (1-10)	8	8	1.00
Pain severity score in 6-7 cm dilation (1-10)	7.5	8.3	0.059
Pain severity score in 10 cm dilation (1-10)	8.1	9.8	0.001

According to (Table 5), the interval of beginning of intervention to complete dilation was 291 ± 30.7 minutes in control group and 189.9 ± 25 minutes in the experimental group. It was significantly shorter in the experimental group.

Table 5. The mean interval of beginning of intervention to complete dilation and its relationship with acupuncture

	Experimental group	control group	p-value
The interval of beginning of intervention to complete dilation	30.7±291	25±189.9	0.001

According to (Table 6), 23 mothers (76.6%) in the control group needed delivery augmentation with oxytocin and 15 mothers (50%) in the experimental group needed delivery augmentation with oxytocin. The need for delivery augmentation with oxytocin was significantly lower in the experimental group.

Table 6. Distribution of need for delivery augmentation with oxytocin its relationship with acupuncture

	Experimental group	control group	p-value
The need for delivery augmentation with oxytocin	N=15 (50%)	N=23 (76.6%)	0.019

Discussion

Medicine has always tried to encourage mothers to have normal vaginal delivery by facilitating the normal vaginal delivery methods. Various pharmacological and non-pharmacological methods have been proposed including water delivery, spinal anesthesia, use of opioids, and many other methods. Acupuncture is one of the methods recommended in the Chinese medicine (12, 13). Severe labor pains can cause long-term emotional disturbances in the mother, and impair her mental health. Also, labor pain causes a lack of oxygen in the fetus, which results in reduced Apgar score in the neonate. It also increases the midwifery interventions and its complications (14-17). Acupuncture has long been used as one of the non-pharmacological methods to reduce labor pain. The effect of acupuncture on reducing the labor pain is due to stimulation of points, leading to increased secretion of hormones facilitating the delivery. This hormone is secreted at lower levels in normal conditions and only improves the stages of delivery, but an increase in its level in blood can have an analgesic effect (18, 19).

The present study was conducted on 60 mothers who were divided into two groups (each group included 30 mothers). The placenta and fetus were removed in the control group with no intervention and normally, but the placenta and fetus were removed in the second group (experimental group) with intervention of acupuncture since the beginning of the contractions and pain. The mean age in the control group was 27.6±2.1 years and the mean age in the experimental group was 28.2±1.19 years. It indicates that the mean age difference in the two groups was very low. It was slightly higher in the experimental group, but this difference was not significant. The mean gestational age was 39.2 ± 0.7 in the control group and 39.0±0.6 in the experimental group. A significant difference was not observed between two groups in this regard, and no significant relationship was found between the mean age of the mothers and results of acupuncture. The mean cervical dilation was 4.2 ± 0.4 cm in the control group and 4.3 ± 0.4 in the experimental group at the baseline. Hence, no significant difference was observed between two groups in this regard.

Out of 30 neonates born in the control group, 13 were male and 17 were female, and out of 30 neonates born in the experimental group, 14 were male and 16 were female. No significant relationship was found between gender of the neonates and the results of acupuncture. Based on

the obtained results, the mean pain score in the two groups at the beginning of the intervention was not different. In the 6-7 cm dilation, the pain score were not statistically different in the two groups, but in the 9-10 cm dilation, it was less in the experimental group compared to the control group. The interval of beginning of intervention to complete dilation was 291 ± 30.7 minutes in the control group, and 189.9 ± 25 in the experimental group. It was significantly shorter in the experimental group. In the control group, 23 mothers (76.6%) needed delivery augmentation with oxytocin, and in the experimental group, 15 mothers (50%) needed delivery augmentation with oxytocin. The need for delivery augmentation with oxytocin was significantly lower in the experimental group.

In a study conducted by Kaplan et al on the role of acupuncture in reducing the duration of the first and second stages of delivery, they concluded that acupuncture reduced the duration of the first and second stages of delivery and reduced the need for oxytocin (20). These results are consistent with those of the present study. In a study conducted by Lee et al, the results revealed that acupuncture was effective in shortening the duration of the first stage of delivery, which is consistent with the results of the present study (21). Based on the results of the study conducted by Park et al, acupuncture increased the severity of uterine contractions without affecting the duration of delivery (22-25). These results were inconsistent with those of the present study in terms of reducing the delivery time. The reason for these differences in the results might be due to the fact that total duration of the first and second stages of delivery was calculated in the study conducted by Park et al, but only the duration of the first stage of delivery was considered in the present study. In a study conducted by Chao et al, results showed that using acupuncture during delivery effectively reduced pain during the first stage of delivery (26, 27), and in the present study, pain was significantly lower in the experimental group. Hence, their results are in line with those of the present study. In a study conducted by Ramnero et al, results showed that pain score and duration of first stage of delivery did not differ between the intervention (acupuncture) and control groups. The results of the present study are inconsistent with the results of the study conducted by Ramnero et al. This difference can be attributed to high mean weight of neonates and low mean height of mothers participated in the Ramnero study. Short mothers have smaller pelvis, and the passage of a large fetus through a small pelvis can prolong the delivery and cause more pain (28).

Conclusion

The results of this study showed that the duration and level of pain in first stage of delivery and the need for delivery augmentation with oxytocin in the intervention group were significantly less than those of the control group. Comparing the results of the present study with those of other studies indicate that acupuncture reduces the duration of delivery, reduces the need for oxytocin, and reduces the level of pain in the first stage of delivery. Therefore, it is recommended to encourage mothers to have a normal vaginal delivery via acupuncture to improve the process of normal vaginal delivery and further promote the normal vaginal delivery in the community.

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