

Effect of Acupressure on Non- stress Test (NST) Results: A Randomized-Controlled Trial Study

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Abstract

Introduction

Pregnancy and delivery are among the most stressful events in women's lives. Breech presentation occurs in 3-4% of all deliveries. Some conventional non-surgical therapies for breech presentation are available. Moxibustion, acupuncture and other acupoint (BL67) stimulations are commonly used for the correction of breech presentation. The present study aimed to evaluate the effect of acupressure on NST results.

Materials and Methods

This is a clinical trial study that was conducted in one group and two-steps. 32 Pregnant women (32-36 weeks) in age range 18 to 35 year-old, who were referred to Shahid Beheshti Hospital in Isfahan-Iran, in 2013 to receive routine prenatal care, were randomly selected. They were stimulated immediately after the first Non- stress test (NST) and before the second test. The researcher evaluated and analyzed variables using SPSS software version 20.

Results

The mean age of the subjects was 24.7 ± 2.8 and 93.8% of them were housewives. The frequency of reactive non stress test was same before and after stimulation. The mean time of the tests' result significantly decreased after stimulation (P-value < 0.05).

Conclusion

Although fetal non-stress test result was not influenced by acupressure, this intervention led to shorter testing time to achieve results. In other words, after the intervention, the time it takes to reach a reactive fetal non-stress test was about 2.7 minutes less than the time without intervention.

Key Words: Acupressure, Fetal assessment, Non- stress test, Pregnant women.

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Introduction

Pregnancy and childbirth are among stressful events in women's lives (1), especially when pregnancy is accompanied by complications. One of the worrying cases for pregnant women is abnormal presentation during the term (2). Some of these abnormal presentations make mothers unable to do natural childbirth; however, other presentations, such as breech presentations, by doing special maneuvers, have the ability to do a natural childbirth (3).

Breech presentation means a fetus in a longitudinal lie with the buttocks or feet located in the vicinity of the cervix (4). The incidence of breech presentation is about 3 to 4%. The percentage of breech deliveries decreased with advancing gestational age. Therefore, this amount in fetuses less than 28 weeks gestation has been 22%; however, in the fetus of 32 weeks gestation, it reaches to 7% and in term fetuses, it reaches 1-3% of vaginal deliveries (5).

The risk for perinatal mortality was 1 in 300 for planned vaginal breech deliveries (6). Recently, some non-surgical interventions have been proposed to improve this presentation (7), including the knee-chest position treatment, external rotation of the fetus, moxibustion, acupuncture and other methods of stimulating points (8-10).

Hunt et al. in their study in 2015 reported that the rate of cesarean delivery after trying to perform a vaginal delivery after external rotation of the head of the breech fetuses has been 13% and the rate of vaginal delivery by device has been 6% with a vaginal delivery (11).

Another method used for changing the breech presentation is using complementary medicine (acupuncture and acupressure). The number of randomized clinical trials studies on using

complementary medicine that has been indexed in MEDLINE increased from fewer than 200 in 1982 to 1200 in 2002. In 2008, more than 7500 studies on methods of complementary medicine practices were indexed in MEDLINE (12).

The largest consumers of these methods are women who self-prescribe treatments for their treatments consistently and without consulting with doctors. Obstetricians and midwives are the best people who can help and advise patients in treatment selection, and consult them about the dangers of complementary medicine and they also support using some of complementary medicine techniques which are potentially useful (13).

Acupressure is a gentle and safe treatment that can maintain order and harmony of body, mind and spirit of the person. Acupressure is considered as one of the alternative treatments and the drug is not used in this type of treatment. To use this treatment you need to press a thumb or other fingers on acupuncture points (14).

Acupressure points can be stimulated to enhance many aspects of life and then to be used (15). In traditional medicine many points are known and each of them has a special influence on the system of the human body. One of the points also used in tokology, BL67 or Zhiyin, is on bladder channel energy. This point is located at the outer surface of the pinky toe hangnail. Stimulation of this point is done in cases of headache, nasal dryness, nosebleeds, abnormal position of the fetus, difficult delivery and retained placenta (16).

BL67 point is a strong point that stimulates the downward movement of the fetus's head in the womb. In their studies, researchers use this characteristic of BL67 point to evaluate the possible changes in fetal heart rate parameters (17). In some of the studies, by stimulating this point in women with breech babies during pregnancy, 75% of participants at the time

of delivery had a fetus with cephalic presentation (18).

Unfortunately, so far, few studies have been conducted on the effect of acupressure on the fetal non-stress test results and also on other methods of fetus health assessments; whereas, the majority of studies conducted in this field have focused on changes in fetal presentation. Considering the above-mentioned, the researcher has tried to study the effect of acupressure on fetal non-stress test results.

Fetal non-stress test results mean either a reactive or non-reactive test. The presence of two or more fetal heart rate accelerations of at least 15 or more beats per minute, higher than baseline fetal heart rate which takes 15 seconds or more and all occur within a 20-minute period after the start of the test, indicates reactive fetal non-stress test. Before conclusions about the inadequacy of the reactivity of the fetus a 40 or more-minute electrocardiogram should be recorded from embryos (for calculation of fetal sleep cycles) (19).

Materials and Methods

The present study is a randomized clinical trial (RCT code= IRCT2012092310913N1). This study was conducted by one group in two steps. The environment of this study was center of gynecology and obstetrics of Shahid Beheshti Hospital in Isfahan, Central of Iran. The study population included pregnant women (first pregnancy) aged 35-18 years old who visited in the center to receive regular prenatal care. Inclusion criteria were:

- 18 to 35 years old,
- First pregnancy,
- Gestational age of 36 to 32 weeks of pregnancy,
- Singleton pregnancy,
- Absence of any disease or disorder during pregnancy.

Sampling in this study was simple random. After signing the consent by the participants and complete personal information in the questionnaire by the researcher, test started.

Before that, the researcher got sure all subject had voided their bladders not to leave the bed and walk to toilet. Before conducting any intervention, non stress test was taken and recorded from all subjects for 20 minutes in left lateral position.

The researcher asked the mothers to sit on the bed in their resting time after the first non stress test and while leaning back to avoid their waist tiredness, they were asked to stretch out their legs in front of the researcher. The researcher sat on a chair in front of the mothers' legs and with mothers' toes in complete access, stimulation acupoint BL67 in external surface of the third knuckle of mothers' little toes in both feet (nail root). The researcher pressured this point for at least two minutes so that the third anterior knuckle of the researcher's thumb went pale. After five minutes, the researcher stimulated the same point by pressure for two minutes. The researcher, in a pilot study on 10 pregnant mothers to assess the length of time and number of repetitions of BL67 acupoint stimulation, found out that stimulation of this point should be conducted twice, each for two minutes, with a five-minute interval. Just after the end of stimulation, the researcher conducted the second non stress test on the mothers and recorded the result (20). Then, 20 minutes after the second non stress test, the researcher dispatched the prob of the device from the mother and Sampling was completed.

In case of any sudden disturbance in fetal or mother's health, or in case of recording any doubtful interpretation of the results or components of non stress test, or lack of

subjects' interest to keep on cooperation, the subjects left out the study.

The researcher analyzed the obtained data of non- stress test, recorded in the questionnaire including fetal non stress test result and the time have passed from start of the test until the results of fetal non-stress test been reactive. The subjects' personals information was analyzed by descriptive and analytical statistical tests (Paired t-test and Mac-Nemar test) through SPSS version 20. A P- Value <0.05 was considered significant for all statistical tests results.

Results

The results of the study suggest that the average age of mothers participating in the study was 24.7± 8.2, and minimum and maximum age of mothers were 20 and 30 years, respectively. Table 1 represents demographic data of the participants in this study.

Table 1: Frequency distribution of the participants

Group	Education Level						Occupational status			
	Illiterate		Below high school diploma		Academic		Housewife		Working	
Acupressure	Number	%	Number	%	Number	%	Number	%	Number	%
		2	6.2	24	75	6	18.8	30	93.8	2

Table 2: Frequency distribution of fetal non-stress test results

Group	Before intervention				After intervention				Mc Nemar's test
	Reactive		Non reactive		Reactive		Non reactive		
Acupressure	Number	%	Number	%	Number	%	Number	%	P value
		30	93.8	2	6.2	29	90.6	3	

Table 3: Mean of elapsed time since the start of the test until achieving reactive fetal non-stress test results (minute)

Variable	Before intervention				After intervention				Paired t-test	
	Mean	SD	Min	Max	Mean	SD	Min	Max	T	P-value
Acupressure	8.5	5.5	2.2	19.5	5.8	5.9	0.7	10.7	2.05	0.04

Discussion

Results of the study showed that stimulation in the form of acupressure led to this fact that fetal non-stress test results

Results of the study showed that fetal non-stress test in the research units led to obtaining reactive results of 93.8%.

After intervention in the form of acupressure, 90 .6% of people had reactive test. Findings related to this variable are presented in (Table 2). As the findings in the above table shows, acupressure has not created any significant effects on fetal non-stress test results.

In Table 3, the data related to the elapsed time have been presented from the start of the test until achieving reactive fetal non-stress test results. As the data in Table 3, shows stimulation in the form of acupressure led to a shorter time to achieve reactive fetal non-stress test results (P-value = 0.04).

before and after the intervention had no statistically significant difference. By examining the variables the researcher realized that although fetal non-stress test results were not affected by acupressure,

using this intervention resulted in shorter testing time to achieve results. In other words, after intervention, the time to achieve reactive fetal non-stress test result is about 2.7 minutes less than the time without intervention. Unfortunately, very few studies are available on this subject. In 2002, a study entitled "Non-stress test changes during acupuncture plus Moxibustion on BL67 point in breech presentation" was conducted by Neri et al., the researchers stated a significant increase in the number of fetal heart rate accelerations during acupuncture with stimulation of BL67 acupoint. This means that the stimulation of this point has led to an increase in reactive test result and the time needed to achieve this result became shorter (21).

While Neri et al. (22) in a study entitled "Effects of three different the stimulation of (acupuncture, Moxibustion, acupuncture along with Moxibustion) on BL67 point in the behavior of breech babies" reported that carried out interventions to stimulate the BL67 point did not change the number of fetal heart rate accelerations. Unlike the above study, the results of this study showed that stimulation of BL67 point using the above-mentioned three different methods could not change fetal non-stress test results.

Guittier et al. (23) in a study entitled "Moxibustion's adverse effect for the rotation of head in breech presentation" concluded that analysis of fetal ECG of the study (taken ten minutes before stimulation, intervention during 20 minutes, and 10 minutes after stimulation) has shown that all items in the fetal Electrocardiography (ECG) have been normal and by BL67 point stimulation, no unpleasant side effects on the fetus have been observed. Results of this study show that shortening of the time required to obtain test results has not been accompanied by abnormal changes in fetal heart rate pattern; thus, in addition to

confirming this technique, it shows improvement in obtaining faster results.

Conclusion

Ineffectiveness of acupressure on the fetal non-stress test results is satisfactory due to the fact that it cannot produce positive or false-negative test results. Furthermore, shortening of the time to achieve fetal non-stress test results can be mentioned as one of the advantages of this method. This issue makes the accuracy of the results have a high reliability after performing such interference so that healthcare providers during pregnancy and delivery can use these interventions to achieve results faster without worrying about the false results. These points can be helpful particularly for high-risk pregnancies and emergencies and even when the number of fetal monitoring devices in comparison with the number of patients is not enough.

Therefore, the researcher suggests that due to the very small number of studies in this field and also the use types of complementary medicine, and also increasing the cases of using different types of complementary medicine, further studies should be conducted in similar situations, and also for high-risk mothers and fetuses.

Conflict of Interest: None.

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