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EFFECT OF HYDROTHERAPY ON PAIN OF LABOR PROCESS

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ABSTRACT Normal vaginal delivery is one of the most painful experiences in life of women. Delivery pain is a complex pain and is one of the most severe and serious problems. Pain a usual symptom in delivery and its characteristics consist of cultural, social, and emotional concepts of people. Pains of vaginal delivery are related to stress in mothers during delivery. For this reason delivery related pain relief is one of the most important issues in tocology. The objective of this study is to investigate the effect of hydrotherapy on labor process and delivery progression. In a clinical trial study on pregnant women in Alzahra educational hospital of Tabriz University of Medical Sciences (TUMS) during March 2010 to March 2013, the effect of hydrotherapy on labor process was studied. 100 pregnant women without risk factor were randomly selected and included in the study. Pregnant women in intervention group gave birth with 37 °C hot water shower and in control group delivery was done in normal way without using hydrotherapy methods. Mean of pain intensityusing Numeric Rating Scale and labor time duration were calculated for both groups. Mean of pain based on NRS was significantly less in intervention group comparing that of control group (P=0.010). Mean of labor time duration in first phase in intervention group was significantly lower than that of control group (P<0.001). There was not a significant difference inmean of labor time duration in the second phase between two intervention and control groups (P=0.395). Apgar score of all children born in both groups was same and equal to 9. In current study using hot water shower for pregnant women led to decrease in labor time duration and also decrease in mean of pain intensity. Results demonstrate useful effect of hydrotherapy in safe accelerating of normal delivery and pain reduction during labor.

KEYWORDS*: Hydrotherapy, Delivery, Pain, Labor, NRS (Numeric Rating Scale)*

INTRODUCTION

Delivery is one of the most important events in the life of any woman which embodies pain and stress (Gayathri et al., 2010). Delivery pain is a complex pain and is one of the most severe and serious pains (Vermelis et al., 2010). Pain is a usual symptom in delivery and its characteristics consist of cultural, social, emotional, and even economical concepts of people (Almeida et al., 2005). Pains of vaginal delivery are related to stress in mothers during delivery (Schnur et al., 2007). Pain and stress in delivery leads to prolonged delivery and increase in level of catecholamines (Anim-Somuah et al., 2005; Waldenström and Irestedt, 2006). Reducing delivery pain is one of the duties of physicians regarding with patients (Simavli et al., 2014). With reduction in delivery pains stress decreases in mothers (Naumann and Sadaghiani, 2014). Up to

now various invasive and non-invasive methods such as use of showers and baths have been used in order to reduce delivery-related pains (Vargens et al., 2013). Hydrotherapy, also known as hydrothermal therapy (Wardle, 2013), is one of the nonpharmacologic methods used in vaginal delivery which is implemented to reduce pain and to relax pelvic arch and perineal muscles (Tiainen, 2014). Hydrotherapy is also applied to treat fibromyalgia (Naumann and Sadaghiani, 2014), arthritic pain (Han et al., 2014) and rheumatoid arthritis (Al-Qubaeissy et al., 2013) and also in burn injuries (Moiemen, 2014).

Generally hydrotherapy for vaginal delivery is used in two ways; the first way is to use hot tub and the second way is to use handheld showers to pour water on the body of mother or normal shower to use during labor and delivery (Avery, 2013). In this study hydrotherapy method with implementing hot water shower has been used. Heat leads to better blood circulation, general body relief, and reduction of stress, and also pouring water on lower abdomen, fundal, groin, back, shoulders and perineumcauses relaxation of muscles in these parts and reduction of muscle tension and consequent pain (Carly, 2001).

The objective of this study was investigating the effect of hydrotherapy on pain and labor duration in pregnant women.

MATERIALS AND METHODS

This was a clinical trial study, and studied population were pregnant women referring to Alzahra educational hospital of TUMS Tabriz-Iran since March 2010 to March 2013 to give birth and the effect of hydrotherapy on labor process was studied. Inclusion criteria were cephalic presentation of fetus, the fetus entrance to the pelvis to rule out the possibility of umbilical cord prolapse, singleton pregnancy and first to third pregnancies, term fetus, complete physical and mental health of the mother, age 20 to 30 years of mother, lack of disease confounding to intensity of pain and labor duration and delivery and Apgar score of newborn child. Exclusion criteria were multiple pregnancy, high-risk pregnancy such as preeclampsia, premature rupture of membrane, intrauterine growth retardation (IUGR), oligohydramnios and fetal anomaly, previous preterm birth, previous cesarean history, bleeding in the third trimester and maternal diseases such as diabetes, hypertension, heart, pulmonary, and renaldiseases and coagulation disorders or uterine problems such as uterine myoma, bicornuate uterus, and other diseases or problems which threatens health of mother or fetus.

After describing the study method and conduction conditions to all participants and getting written informed consent, finally 100 people included into study from which 50 were primiparousand 50 were multiparous (the second and third deliveries). By considering equal number of primiparous and multiparous persons in each group, people were randomly divided into two 50-person groups using Randlist software (version 1.2).

Samples of intervention group after referring to the hospital and entering to the delivery room and finishing primary clinical examinations, took a 37 ^{o} C hot water shower for 30 minutes. In control group, mothers were hospitalized in labor and delivery room with similar conditions to those of case group and the only difference between this group and case group was lack of hot water shower in samples of mentioned group. Before taking shower all samples underwent cardiotocography (CTG) to be sure about lack of fetal distress symptom. To collect data NRS (Numeric Rating Scale) was used to measure pain intensity in dilatations of 4, 6, 8, and 10 centimeter and pain intensity in any sample was obtained from mean of four numbers. Time duration of various phases of labor was also determined based on partographyand first the primary phases of labor between two intervention and control groups were

compared then the second phases, and finally total duration of first two phases of labor were compared. Apgar score of infants in the first and fifth minutes after birth were determined and compared in groups under study. Final analysis of data was conducted using SPSS 13 software. To compare means T-test was used and significance level was determined as $P<0.05$.

RESULTS

Mean age of pregnant women in intervention group was 25.6 ± 4.3 and in control group it was 26.1 ± 3.9. Mean age of samples of two groups under study has not a significant difference (P=0.9). Mean of delivery pain intensity based on NRS in primiparous mothers in intervention group was 7.18 ± 0.85 and that of control group was 7.58 ± 0.99. Difference of mean delivery pain in primiparous women based on NRS was not significant between two groups (P=1.0). Mean of delivery pain intensity based on NRS in multiparous mothers in intervention group was 7.2 ± 0.86 and that of control group was 7.75 ± 0.92 and statistically speaking mean of delivery pain intensity based on NRS in multiparous women in intervention group was less than that of control group (p=0.03). Mean pain based on NRS in primiparous mothers of intervention group and multiparous mothers in intervention group has not a significant difference (p=0.9). Generally mean of delivery pain intensity based on NRS was7.1 ± 0.85 in intervention group and7.6 ± 0.95 in control group. The mean of delivery pain intensity based on NRS in intervention group was significantly less than that of control group (P=0.010). Labor time duration in various phases of under study groups was as shown in Table 1.

Table 1: time of labor phases in study groups

Parameter	Intervention group	Control group	P
Time of first phase of Labor In nulipara (min)	149.8 ± 40.2	260.2 ± 52.4	0.001
Time of first phase of Labor In multipara (min)	89.2 ± 24.8	159.8 ± 39.4	0.001
Time of first phase of Labor (min)	119.5 ± 45.05	210.6 ± 55.45	< 0.001
Time of second phase of Labor In nulipara (min)	32.2 ± 20.1	36.3 ± 21.6	0.5
Time of second phase of Labor In multipara (min)	9.8 ± 6.6	12.6 ± 7.1	0.2
Time of second phase of Labor (min)	21 ± 18.65	24.32 ± 23.2	0.395
Time of first and second phase of Labor In nullipara (min)	182.2 ± 52.45	296.24 ± 69.3	< 0.001
Time of first and second phase of Labor In multipara (min)	99.7 ± 33.2	172.2 ± 40.25	< 0.001
Time of first and second phase of Labor (min)	140.5 ± 58.5	234.6 ± 84.9	< 0.001

Mean of labor time in the first and second phases and sum of first and second phases of labor in multiparous women of intervention group were significantly less than those of primiparous women in intervention group ($p<0.001$). Apgar score of all infants born in both groups of intervention and control was same and equal to 9.

DISCUSSION

Delivery is a physiologic and an important phenomenon for women with intense pain (Fereidoony et al., 2014). Pain is a mental experience and physiological, emotional, and environmental factors affect it (Leeman et al., 2003). Delivery pain is one of the most intense pains that women experience in their lifetime and could lead to anxiety, fear, and even depression (Curžik and Begić, 2012). So relief of delivery pains is an important subject of tocology. Muscle relaxation,acupressure, hydrotherapy, music therapy and massage therapy are of nonpharmacologic methods for labor pain reduction (Arendt and Tessmer-Tuck, 2013). In the current study intensity of labor pains in intervention group was significantly less than that of control group, which represents hydrotherapy effect on reduction of delivery pain during labor process.

Another study has also mentioned to the effect of hot water shower in reduction of labor pains and relaxation (Chaichian et al., 2009). But in a study using hot water shower did not cause a significant effect and change in labor procedure (Eckert et al., 2001). Also in another study hot water shower for 30 minutes in temperature of 37-39 ^{o} C led to reduce in labor pains in dilatations of 4-5 cm cervix (Santos et al., 2013). Two other studies have also mentioned to the effect of hydrotherapy in reduction of delivery pains in dilatations greater than or equal to 8 cm cervix (Davim et al., 2007; Davim et al., 2009). In a study it has been mentioned to reduction of stress and labor pain in women caused by use of hydrotherapy and also amount of pain reduction was directly correlated with pain amount (Benfield et al., 2010). Using hot water shower in a study led to stress improvement and relief of labor pain during delivery and had not statistically significant difference with pharmacologic methods (Benfield et al., 2001). A study declared that using hot shower during delivery had not negative effect on sample women and there was not a significant difference in pain and complications and delivery duration between hot shower group and routine control group (Ohlsson et al., 2001). In another study using hydrotherapy lead to improvement in neuroendocrine reactions and mothers' mental status and the pain amount of mothers in a group which had used hydrotherapy method was less than that of control group (Benfield et al., 2010).

Using hydrotherapy technique is usually cheap and without side effects and available and is in accordance with culture of societies and this method leads to pain reduction and improvement in delivery progress. Based on the results of current study using the method of delivery in water or at least providing proper facilities to use warm water and showers in delivery room with supervision of midwife could be a method for relieving labor pains.

In this study mean of labor time in the first phase in intervention group was significantly less than that of control group ($P<0.001$) but there was no significant difference between two groups of intervention and control in terms of mean of labor time in the second phase ($P=0.395$). In another study conducting hydrotherapy method in dilatations of 5-6 cm cervix had led to reduction in labor time (Macedo et al., 2005). In other study delivery in water caused reduction in all three phases of labor, especially 2nd and 3rd phases of labor comparing with using epidural analgesia method (Mollamahmutoğlu et al., 2012). Implemented method to reduce delivery pains is related to available facilities and preference of person (Kashanian and Shahali, 2009). Finally hydrotherapy is a relatively cheap and available method without any side effect, which could be used to reduce labor pains and labor time.

CONCLUSION

Mean of pain based on NRS in intervention group was significantly lower than that of control group and mean of labor time in the first phase in intervention group was significantly lower than that of control group. Obtained results represent useful effect of hydrotherapy and taking shower during labor for women in a way that causes acceleration of risk-free procedure of delivery and reduction in labor pain and probably also decreases fetal stress.

SUGGESTIONS

This method should be developed in other delivery centres in pregnancies without risk factor and also wider studies are suggested to obtain more precise results.

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