

Effect of Physiologic Labor on Pain Intensity during Active Phase of Labor

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Abstract: Labor pain is natural. Increased cesarean rate, the major reason of which is fear of labor, is one of the problems of health systems. Today, much emphasis is put on promoting the use of non-pharmacological methods of pain relief. Accordingly, this study was conducted to investigate the effect of physiologic labor on pain intensity during active phase of labor in the mothers referring to the maternity hospitals of Zanjan in 2013. This study is a kind of clinical trial in which 200 eligible nulliparous women referring to the maternity hospitals of Zanjan were randomly selected and placed into two groups (physiologic labor and normal labor). The data collection tools included Visual Analogue Scale of Pain (VAS) and a questionnaire. The validity of the data collection tools was confirmed using content validity. The reliability of pain assessment tools was confirmed through an agreement between the assessors. The reliability of the satisfaction questionnaire was confirmed through qualifying domestic trust. Data analysis was done using SPSS, descriptive statistics, and inferential statistics such as the paired t-test, chi-square, Mann-Whitney, and Wilcoxon tests. According to the results, there was no significant difference between the two groups in terms of age, Body Mass Index (BMI), education level, gestational age, and employment status. The mean duration of active phase in the two control and experimental groups was not significantly different ($p = 0.211$). The pre-intervention pain intensity was not significantly different; however, the pain intensity at 3-4 cm dilation and 7-8 cm dilation in the physiologic labor group was significantly less than in the control group ($p = 0.001$). The findings show the effect of physiologic labor on pain intensity. The widespread use of physiologic labor could improve qualitative indicators for maternal health.

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1. Introduction

Childbirth is a physiological process whose requirements are provided by God in humans like in other mammals so that it could be done naturally without medical intervention (Filed,1997). Providing childbirth services is one of the most critical and important services of health systems around the world. Since all services must be appropriate, affordable, and with minimum physical and psychological side effects, childbirth process is no exception (Kennel,1991). Various studies show that 85% of natural childbirths do not need medical intervention, and this physiological and natural process will be healthily passed only by training mothers and taking care of them during childbirth (Filed,1997). With the development of specialized and hospital services within the last 5 decades in Iran, and the growing trend of childbirths at birth centers and hospitals, childbirth is now looked upon as a medical and technical problem with unnecessary medical interventions (Geung,2007).

Labor pain is a severe pain women experience during their lives (Rahmani,2012). This kind of pain can also cause prolonged emotional imbalances, which can damage maternal mental health and have a negative effect on mother-child relationship (Amir,2012). According to the Maternal Health Department of the

Ministry of Health, two sets of factors related to mothers and physicians are responsible for the increased cesarean rate in Iran. Fear of severe and overwhelming pain of natural childbirth is among the maternal causes of cesarean (Campell 2006). Most researchers make great efforts to find methods for relieving labor pain. This way, they can help physiologic labor and prevent the growing trend of cesarean due to the fear of labor pain using the most effective treatments with least side effects (Sandin-Bojo,2011). It seems that increased maternal satisfaction with natural childbirth using pain-relieving methods can increase maternal satisfaction with childbirth process. According to health care providers, policymakers, and administrators of health care systems, women's satisfaction with childbirth experience is regarded as one of the most important indicators of maternal health care quality (Shakeri,2011). Given the importance of this issue, much attention in recent years has been paid to maternal satisfaction with childbirth and making it a pleasant experience (Longer,1998). Therefore, this study was conducted to investigate the effect of physiologic labor on pain intensity during active phase of labor in the mothers referring to the maternity hospitals of Zanjan in 2013.

2. Materials and Methods

This study is a kind of clinical trial in which 200 eligible nulliparous women referring to the maternity hospitals of Zanjan were randomly and non-randomly (quota sampling) selected and placed into two groups (physiologic labor and normal labor). The inclusion criteria were as follows: primigravida, 18-35 years of age, singleton pregnancy with fetal head view, gestational age between 38-40 weeks, no history of infertility, anticipated date of childbirth, and possibility of natural childbirth. The exclusion criteria were as follows: fetal distress, detection of fetal anomalies during current pregnancy, premature rupture of membrane, fast or premature labor, taking medications for pain relief, mismatch between pelvis and head, any complications during labor, and any problems or issues requiring any maternal-fetal intervention. First, the questionnaire no. 1, which included the demographic characteristics and inclusion and exclusion criteria, was filled in by the researcher for each sample. Then the eligible samples were placed into two groups (physiologic labor and normal labor).

In this study, the data were collected by measuring physiological data and doing interviews, and the data collection tools included demographic information form and Visual Analogue Scale of Pain (VAS) (10). The validity of the data collection tools was determined using content validity, and the reliability of the VAS questionnaire was determined using equivalence testing (it was simultaneously performed for 10 mothers by the researcher and midwives of the maternity hospitals. The correlation coefficient was 0.94). In the physiologic labor group, the 6 principles of physiologic labor were emphasized. These principles include spontaneous onset of labor, freedom of movement (walking) during labor, continuous support during labor, avoiding the use of

routine interventions, spontaneous pushing in non-supine positions, and non-separation of mother and baby at birth. The principles of physiologic labor were also observed. These principles include special care during childbirth, having a companion, intermittent auscultation of fetal heart, movement, changing position, minimal interventions, and limited vaginal examinations. In the normal labor group, there were interventions such as shaving, enema, keeping the vessels open, simulating or intensifying labor with oxytocin, breaking bag of water, intermittent monitoring of fetal heart, episiotomy, and Ritgen's Maneuver. Common interventions were also performed as usual and prescribed by a midwife. After receiving their consent, the samples were placed into the physiologic labor and normal labor groups. The pain intensity of the research units was measured using the Visual Analogue Scale of Pain (VAS) at 3-4 cm dilation (beginning of the active phase of the first stage of labor), 7-8 cm dilation, and full dilation. The Visual Analogue Scale of Pain (VAS) is a verbal, numerical, and standard criterion, and in the verbal criterion, analgesia and the most severe pain are shown by the scores of "0" and "10", respectively.

The data were applied using descriptive statistics (frequency distribution tables and central tendency and dispersion index) and inferential statistics such as Analysis of Variance (ANOVA), independent t-test, and chi-square with a significance level of 0.05.

3. Findings

According to the results, the female subjects were in two homogenous groups in terms of their age, mothers' level of education, BMI, gestational age, intended or unintended pregnancy, duration of marriage, family's economic situation, husband's occupation, and husband's level of education (table 1).

Table 1: Frequency Distribution of the Individual Characteristics of the Pregnant Women Referring to the Maternity Hospitals of Zanjan in Two Groups (Physiologic Labor and Normal Labor)

Characteristics		Experimental Group		Control Group		Results
		Numbers	Percentage	Numbers	Percentage	
Age (Year)	<20	10	9.6	7	7.4	P=0.257
	30-20	86	86	84	83.8	
	>30	4	4.4	9	8.8	
Occupation	Housewife	96	95.6	80	79.6	P=0.281
	Employed	4	4.4	20	20.6	
Education Level	Primary School	4	4.4	3	2.9	P=0.892
	Secondary School	17	16.9	14	14	
	High School	52	52.2	52	52.2	
	University	27	26.5	31	30.9	
BMI	<19.8	17	16.2	22	22.1	P=0.422
	26-19.8	49	49.3	49	49.3	
	29-26	22	22.1	19	19.1	
	>30	12	12.5	10	9.6	
Pregnancy (Week)	40	54	53.7	50	50	P=0.321
	39	17	17.6	13	13.2	
	38	29	28.7	37	36.8	
Pregnancy	Intended	94	94.1	92	91.9	P=0.212
	Unintended	6	5.9	8	8.1	

Table 2: Comparing Pain Intensity at Different Stages of Active Labor in Nulliparous Women Referring to the Maternity Hospitals of Zanjan (by physiologic labor and normal labor groups)

Variable	Physiologic Labor Group	Normal Labor Group	P value
Pre-Intervention	02.1±02.4	22.1±17.4	324.0
3-4 cm	87.1±89.5	78.0±78.6	01.0
7-8 cm	98.0±68.6	89.0±27.8	001.0

A comparison of the results showed that there was no significant difference between the duration of the active phase of labor in the two groups (the physiologic labor with a mean and standard deviation of 2.12 (0.4889) and the normal labor with a mean and standard deviation of 2.01 (0.8936)) ($p = 0.211$). Compared to the difference of the mean pain intensity based on the VAS index in the two groups during hospital admission phase, the results of ANOVA test showed that there was no significant difference between the two groups in terms of the mean pain intensity at the beginning of the study (before intervention). These results also showed that all of the samples were selected with the same level of pain. However, there was a significant difference between the two methods in terms of the mean pain intensity at 3-4 cm dilation and 7-8 cm dilation (table 2).

4. Discussion

The findings showed there was a difference between the two groups (physiologic labor and normal labor) in terms of the mean pain intensity during different hours of labor and after the study began. As the results of the Mann-Whitney test shows, this difference is significant. In their study, Melzack et al. showed that pain intensity rate, during the first half hour until the end of the sixth half hour at the first stage of labor, ranged between low to moderate, and moderate to severe for the physiologic labor and normal labor groups, respectively (Khorsandi,2008). In a study, Chang using birth ball during pregnancy and labor could ease labor pain and make it a pleasant experience (Hodnett,2002). In a study by Keshavarz, it was shown that women's pain in an upright position had a significantly lower phase of maximum slope; however, the pain intensity rate was not significantly different in the normal labor group (Keshavarz,2009). There are very few studies on the effect of physiologic labor on labor pain intensity. However, some studies have proved the effect of physiologic management of labor on pain intensity (Naghizadeh,2012, Goodman,2004).

The policy of fasting during labor is an unnecessary medical intervention, which is rejected when it comes to physiologic labor. Rostampy showed that eating easily digestible foods could reduce maternal anxiety during the stages of labor. These results are consistent with the findings of the present study (Rostampy,2010). Anxiety during labor increases pain intensity and reduces maternal satisfaction

(Geung,2007). Eating foods containing carbohydrates during labor does not increase the incidence of vomiting, and it could even shorten the second stage of labor and decrease labor pain intensity (Campell,2006). In a study on the effect of soluble carbohydrates on delivery outcomes for nulliparous women, Exipers et al. showed that there was no significant difference between receiving nutrition and labor pain intensity (Hidarnia,2005). It seems that there is a relationship between the type of nutrition and received liquids and the rate of maternal pain (Filed,1997).

Using physiologic process of labor and changing the common trend of labor can reduce pain intensity, increase maternal satisfaction with childbirth, and consequently promote family health. Further studies are recommended to investigate every single components of care in physiologic labor in order to promote maternal health.

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