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Effect of Two Different Positions on Parturients' Perception of Labor Pains Intensity

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ABSTRACT

Background: Labor is a local process that involves the abdomen and reproductive organs, but its intensity is so great that almost all body systems are affected. One of the various systems in which major changes occur in response to labor is in the neurological system, which is related to pain. Position assumed during childbirth affects the woman's anatomic and physiologic adaptations to labor. **Objective:** To determine the effect of two different positions on parturients' perception of labor pains intensity. **Methods:** A randomized, crossover study was conducted at the delivery room affiliated to King Fahd University Hospital in Saudi Arabia Kingdom. It included 84 parturient primiparae who were randomly assigned to one of two groups, in which either side-lying or sitting position was first used then alternate with the other position to avoid order effect. Group 1 started in the sitting position for 15 minutes, and then they were asked to reposition themselves in the side-lying position. Group 2 started in the side-lying position for 15 minutes, and then they were asked to reposition themselves in the sitting position. An interview and physical assessment sheet was developed and used by the researchers to collect data about general characteristics as well as general and local physical assessment. The Visual Analogue Scale (VAS) was also used to measure the intensity of labor pains as perceived by participants in each position. **Results:** The results of the study revealed that mean pain score was statistically decreased in side-lying position among group 1, while it was statistically increased in sitting position among group 2, although sitting position statistically enhanced cervical dilatation and rupture of membranes among group 2. **Conclusion:** Side-lying position significantly reduces the intensity of labor pains during the active phase of labor.

Keywords: Labor Pains**,** Parturients' Position, Visual Analogue Scale (VAS).

INTRODUCTION

Parturition is a unique, exciting, wondersome, yet sometimes worrisome experience for women and their partners, as well as for health care providers.(1)

Uterine muscles' contractions associated with labor are unique in that they are usually painful. In labor, pain is caused by ischemia of the uterine muscles, stretching and traction of the uterine ligaments, traction of the ovaries, pressure on the urethra, bladder and rectum, and distention of the lower uterine segment, pelvic floor

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muscles and perineum.[2]

Perception of pain is influenced by various factors. The biological, psychological, social, spiritual, cultural and educational dimensions of each woman have an impact on how they express themselves and, indeed, how they perceive pain intensity during labor. Women, who come into labor believing that the pain will be horrible, are usually surprised afterward to realize that the agony they had expected never materialized. On the other hand, expectation of pain may make a woman so tense during labor that her pain is worse than it would have been if she had been relax. A woman can not relax simply because she is instructed to do so by another person, however, some additional intervention must be used.[3, 4]

With the beginning of the active phase of labor, uterine contractions increase in intensity and duration, occur more frequently (every 3-5 minutes) and the cervix undergoes more rapid dilatation (from 1.2 cm/hr to 1.5 cm/hr). This phase begins when the cervix is 3-4 cm dilated in the presence of rhythmic uterine contractions and it ends when the cervix is fully dilated (10 cm). It is commonly expected to be completed within 6–12 hours.[5, 6]

Clinicians prefer non-pharmacological approaches to help relieve labor pains. Although maternal position has been used as a low-cost, safe and useful method for reducing labor pains, yet it is reported that ambulation during labor decreases labor pains, as well as, the need for analgesia. However, little data from randomized controlled studies are available about the pain relieving effects of alternate maternal positions. It was recommended that women should be encouraged to give birth in the position they find most comfortable.[7, 8]

However, studies carried out on ambulation, mobility and positioning during labor agree that mobility during labor improves both women's experience and the

outcome of labor. Thus, the effect of maternal position on labor pains remains unclear, and many women continue to deliver in the traditional recumbent position. Therefore, this study was designed to determine the effect of two different positions namely; side-lying and sitting positions on parturients' perception of labor pains intensity.

SUBJECTS AND METHODS

This is a randomized, crossover study design, in which the same group of participants served as the control and the experimental group, to control the influence of the factors affecting the perception of labor pains.

This study was conducted at the delivery unit affiliated to King Fahd University Hospital in Saudi Arabia Kingdom. A convenience sample of 84 primiparae, in their active phase of labor (6-8 cm. cervical dilatation) was assigned randomly to one of two equal groups, in which either the side-lying or sitting position was first used then alternated with the other position to avoid order effect. Inclusion criteria included 37 to 42 weeks of gestation; no medical or obstetric risk factors; a single viable fetus in cephalic presentation; no administration of any pharmacological method of pain relief; 5 minuets or less intervals of uterine contractions; Arabic as the native language; and willing to participate in the study. Exclusion criteria involved an accelerated progress and inducement of labor as well as preference for a particular position.

Two tools were used for data collection. The first tool was an interview and physical assessment sheet, which was developed and used by the researchers to collect general characteristics data such as age and education, general physical assessment such as height and weight, as well as local physical assessment including cervical dilatation, effacement, station, contractions and condition of membranes.

The second tool was Visual Analog Scale (VAS),[9] which was adopted and used to measure the intensity of labor pains. It consists of a horizontal line in centimeters from 0 to 10 with two opposing extremes at each end; i.e. “no pain” and “worst possible pain”, while the rest of the line is blank. The client is asked to put a mark on the line indicating their pain intensity at the present time. This mark is then measured in centimeters from the no pain end to obtain the client's score. Sometimes descriptive terms, such as 'mild', 'moderate' and 'severe', or numbers are provided along the scale for guidance.[10, 11]

The VAS has been used in clinical trials to measure pain. The results of various studies had indicated that there was a correlation between the VAS measurements of the pain severity and other methods.[12,13] Another study measuring acute pain indicated that the VAS was sufficiently reliable as a measuring instrument.[14] In addition, it has been used to measure both the quantitative degree of pain and sensitivity to pain.[15] The VAS is readily administered and scored, so that the researcher can explain and administer it quickly with the time limit in clinical setting.

Official permission was obtained from the responsible authority in the study setting to carryout the study, after explaining its purpose.

The first tool was developed by the researchers after extensive review of relevant and recent literature and validated by a jury of 5 experts in the related field.

An informed oral consent for participation in the study was obtained from each woman and confidentiality of the collected data was ensured.

A pilot study was carried out on 8 women, who were excluded from the study subjects, to ascertain the relevance of the first tool, to detect any problem peculiar to the statements and to estimate the time needed to

complete it. Following this pilot study, the tool was reconstructed and made ready for use.

Each participant was interviewed on admission to the labor room in order to collect the necessary data, perform general and local examination, as well as explain how to mark the VAS.

Intensity of uterine contractions was measured by the cardio-tocography machine, which is routinely used for women in the labor room, while station and condition of membranes were assessed by vaginal examination to assess the progress of labor. Meanwhile, cervical effacement and dilatation were regularly assessed by vaginal examination, till dilatation reached 6 to 8 centimeters.

Group 1 began with 15 minutes in the sitting position in the bed with the back supported in 90 degrees vertical, they then repositioned themselves in side-lying position horizontally in the bed with the head elevated 10 degrees. Meanwhile, group 2 began with the side-lying position for 15 minutes then shifted to the sitting position. Each group was asked to undergo one set of this alternating positioning during cervical dilatation from 6 to 8 centimeters. Fifteen minutes was the time frame selected because the cervix dilates at 1.2 cm/hr during the active phase of labor in primiparae and pain typically increases as labor progress.

Participant marked on the line representing the perceived intensity of labor pains in the V A S before positioning and after each alternate position. A score was determined by measuring the distance from the “no pain” end to the location marked by participants. The score of pain intensity was classified as; no pain (0), mild pain (1-3), moderate pain (4-6) and severe pain (7-10).

Statistical analysis was performed using SPSS for windows. Tests of significance namely, student *t*-test, chi-square and ANOVA test were used at 5% level to demonstrate the differences between the two groups.

RESULTS

Table 1 presents the general characteristics of women. It was noticed that both groups were almost similar, where no significant differences were found between them in relation to mean age, level of education, or mean height and weight.

Table 1. Distribution of studied women according to their general characteristics

General characteristics	Group 1 (n = 42)		Group 2 (n = 42)		Test of significance (*P*- value)
Age (years):					
Mean ± SD	29.36 ± 5.03		27.64 ± 6.77		*t*= 1.322
Min – Max	23.00 – 40.00		17.00 – 43.00		(*P*=0.190)
Level of education:	**No.**	**%**	**No.**	**%**	
Illiterate	9	21.40	5	11.90	X^2 =1.613
Basic	18	42.90	18	42.90	(*P*= 0.446)
Secondary	15	35.70	19	45.20	
Height (cm):					
Mean ± SD	155.71 ± 4.72		154.79 ± 3.55		*t* =1.010
Min – Max	147.00 – 163.00		150.00 – 160.00		(*P*=0.316)
Weight (kg):					
Mean ± SD	73.00 ± 9.33		70.43 ± 7.85		*t*=1.366
Min – Max	60.00 – 99.00		56.00 – 85.00		(*P*=0.176)

Significant: $P < 0.05$

Table 2 illustrates assessment of cervix and station during intervention. As regards cervical effacement, no significant differences were observed within each group and between both groups. In relation to cervical dilatation, significant differences were noticed within group 1 (*P*=0.018) and within group 2 (*P*=0.000) as well as between both groups (*P*=0.000), where group 2 recorded a higher mean score compared to group 1. Considering station, highly significant differences were found within group 1 (*P*=0.002) and between the two groups (*P*=0.000) as group 1 had higher mean values than group 2.

Table 2. Distribution of studied women according to assessment of cervix and station during intervention

Assessment of cervix and station	Group 1 (n = 42)		Group 2 (n = 42)		One way ANOVA Test (*P*)
	Sitting position	Side-lying position	Side-lying position	Sitting position	
Cervical effacement (%):					
Mean ± SD	87.14 ± 15.97	92.86 ± 13.49	87.86 ± 10.94	91.43 ± 9.26	1.992
Min – Max	50.00 – 100.0	50.00 – 100.0	70.00 – 100.0	80.00 – 100.0	(0.117)
t-test	1.773 (0.080)		1.614 (0.110)		
Cervical dilatation (cm):					
Mean ± SD	6.36 ± 0.62	6.71 ± 0.71	6.29 ± 0.59	6.86 ± 0.75	7.013
Min – Max	6.00 – 8.00	6.00 – 8.00	6.00 – 8.00	6.00 – 8.00	(0.000)*
t-test	2.406 (0.018) *		3.871 (0.000) *		
Station:					
Mean ± SD	2.07 ± 0.89	1.50 ± 0.74	1.07 ± 0.81	0.79 ± 0.95	18.021
Min – Max	0.00 – 3.00	0.00 – 3.00	0.00 – 3.00	0.00 – 3.00	(0.000) *
t-test	3.192 (0.002) *		1.454 (0.150)		

* Significant: $P \leq 0.05$

Table 3 clarifies the characteristics of uterine contractions and condition of membranes during intervention. In relation to interval, duration and intensity of contractions, significant differences were observed within group 1 (*P*=0.002, *P*=0.002 and *P*=0.000, respectively) and within group 2 (*P*=0.002, *P*=0.000 and *P*=0.028, respectively). The relationship between both groups was also statistically significant (*P*=0.000), where group 2 had decreased mean interval, increased mean duration and stronger mean intensity than group 1.

The table also presents the condition of membranes during intervention. It was revealed that significant differences were noticed within group 1 (*P*=0.011) and within group 2 (*P*=0.001), as well as between both groups (*P*=0.000), as group 2 had increased mean of ruptured membranes than group 1.

Table 3. Distribution of women according to assessment of uterine contractions and condition of membranes during intervention

Uterine contractions and membranes	Group 1 (n = 42)				Group 2 (n = 42)				One way ANOVA Test (*P*)
	Sitting position		Side-lying position		Side-lying position		Sitting position		
Interval (min):									
Mean ± SD	2.93 ± 0.81		2.43 ± 0.63		3.43 ± 1.06		2.71 ± 1.04		9.218
Min – Max	2.00 – 4.00		2.00 – 4.00		2.00 – 5.00		1.00 – 5.00		(0.000) *
t-test	3.158 (0.002) *				3.1422 (0.002) *				
Duration (sec):									
Mean ± SD	39.29 ± 15.99		51.43 ± 19.07		33.93 ± 16.14		52.86 ± 18.52		11.757
Min – Max	20.00 – 60.00		30.00 – 90.00		20.00 – 85.00		30.00 – 80.00		(0.000)*
t-test	3.161 (0.002) *				4.994 (0.000) *				
Intensity:	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	***X²***
Mild	24	57.10	3	07.1	6	14.30	6	14.30	36.670 (0.000)*
Moderate	15	35.70	30	71.4	27	64.30	12	28.60	
Strong	3	07.10	6	14.3	9	21.40	24	57.10	
X²	24.082 (0.000)*				12.587 (0.028)*				
Membranes:									
Intact	24	57.10	9	21.40	24	57.10	6	14.30	28.030
Rupture	18	42.90	33	78.60	18	42.90	36	85.70	(0.0002)*
X²	11.230 (0.011)*				16.800 (0.001)*				

* Significant: *P≤ 0*.05

Table 4 illustrates the scores of Visual Analogue Scale (VAS). In relation to abdominal, lumber and total pain during contractions, as well as continuous abdominal and lumber pain, highly significant differences were found within group 2 (*P*=0.000) as the mean pain score increased in sitting position. In addition, highly significant differences were noticed between both groups (*P*=0.000), where group 2 had higher mean scores than group 1. As regards continuous total pain, significant differences were noticed within group 1 (*P*=0.045) and within group 2 (*P*=0.000), as well as between both groups (*P*=0.000), where the mean pain score decreased in side-lying position among group 1, and increased in sitting position among group 2.

Table 4. Distribution of women according to Visual Analogue Scale scores in sitting and side-lying positions

Visual Analogue Scales' items	Group 1 (n = 42)		Group 2 (n = 42)		One way ANOVA Test (*P*)
	Sitting position	Side-lying position	Side-lying position	Sitting position	
Abdominal pain during contractions					
Mean ± SD	5.57 ± 2.05	5.64 ± 1.90	5.07 ± 1.35	6.93 ± 1.73	8.374
Min - Max	3.00 - 10.00	3.00 - 10.00	3.00 - 8.00	3.00 - 10.00	(0.000) *
t -test	0.162 (0.872)		5.493 (0.000) *		
Continuous abdominal pain					
Mean ± SD	5.71 ± 2.40	5.36 ± 2.31	5.36 ± 1.51	7.14 ± 1.26	8.071
Min – Max	1.00 - 10.00	1.00 - 10.00	4.00 - 8.00	4.00 - 9.00	(0.000) *
t -test	0.681 (0.498)		5.866 (0.000) *		
Lumber pain during contractions					
Mean ± SD	5.50 ± 1.37	5.57 ± 1.90	5.14 ± 1.47	7.21 ± 1.49	14.497
Min – Max	4.00 - 8.00	2.00 - 9.00	3.00 - 9.00	4.00 - 9.00	(0.000) *
t -test	0.194 (0.847)		6..409 (0.000) *		
Continuous lumber pain					
Mean ± SD	4.93 ± 2.00	5.07 ± 2.11	5.14 ± 1.32	7.36 ± 1.46	18.329
Min – Max	2.00 - 8.00	1.00 - 8 00	4.00 - 8.00	4.00 - 9.00	(0.000) *
t -test	0.312 (0.558)		7.310 (0.000) *		
Total pain during contractions					
Mean ± SD	5.29 ± 1.85	5.29 ± 1.97	4.93 ± 1.05	6.50 ± 1.19	8.057
Min – Max	2.00 - 10.00	2.00 - 8.00	3.00 - 7.00	3.00 - 8.00	(0.000) *
t -test	0.000 (1.000)		6.411 (0.000) *		
Continuous total pain					
Mean ± SD	6.36 ± 2.05	5.36 ± 2.44	5.14 ± 1.07	6.57 ± 1.36	6.483
Min – Max	2.00 - 9.00	1.00 - 10.00	4.00 - 7.00	4.00 - 8.00	(0.000) *
t -test	2.034 (0.045) *		5.356 (0.000) *		

* Significant: *P*≤ 0.05

DISCUSSION

Labor, the culmination of pregnancy, is an event with great psychological, social and emotional meanings for the mother and her family. It affects several body systems including the neurological system; therefore, many women experience stress and physical pain. Pain of labor is associated with an increased respiratory rate that may lead to acid-base balance alteration and alkalosis, which may affect the diffusion of oxygen across the placenta, leading to fetal hypoxia.[1,2,3] Although the effect of the maternal position on reducing labor pains had been studied, the data

presented to date have not been conclusive. Therefore, the aim of this study was to determine the effect of two different positions on parturients' perception of labor pains.

Women acquire fear of vaginal birth from friends who relayed stories of severe pain. Twelve out of thirteen vaginal delivery women described their experience of labor pain as intolerable, and that they had never experienced pain like it before.[16] The results of this study demonstrated that side-lying position significantly reduced lumber pain during an active phase of labor.

The current finding was congruent with Odent (2010)[17] and DiFranco (2011)[18] who emphasized that side-lying position was a great position for the mother who was very tired and needed rest and relaxation. It also minimized the effect of gravity and got the weight of the baby off the mother's back, opened up her pelvis, and could be maintained for long periods if the mother had help supporting her upper leg. In addition, Pillitteri (2007)[19] mentioned that side-lying position prevented supine hypotension, promoted placental blood flow and efficient contractions. It could also be used with continuous fetal monitoring. Moreover; De Jonge et al (2004)[20] reported that in a lateral position the blood loss may appear less than in an upright position. Furthermore, Shorten et al (2002)[21] suggested that side-lying helped slow down a labor that was progressing too fast and may helped avoid tearing of the perineal area as the baby comes out.

In contrast, the study of Adachi et al (2003) [22] revealed that the sitting position offered an effective method to relieve lower back labor pain during active phase. Bondner et al (2003)[23] also observed a statistical significant decrease in the use of analgesia in women using the upright position.

The results of the current study also demonstrated that abdominal pain during contraction and continuous abdominal pain

were significantly lower in side-lying position. This finding was different from that of Molina et al (1997)[24] who found that the majority of women felt less abdominal pain either continuous or during contractions in the recumbent position.

The first stage of labor may last 18 hours; most of women could not tolerate the labor pains and could not sleep because of it. The results of the current study proved that total pain during contractions and continuous total pain were found to be less in side-lying position. This finding disagreed with the study of Adachi et al (2003)[22] who found that total pain either during contractions or continuous were significantly lower in sitting position. Bondner et al (2003)[23] also observed a statistical significant decrease in the use of oxytocin in women using the upright position. In addition, a systematic review of Gupta et al (2004)[25] showed that women being upright results in fewer reports of severe pain.

It was found that more labor pains significantly associated with sitting position, compared to side-lying one during an active phase of labor. Although, some studies concluded laboring and delivering in an upright position was associated with beneficial effects. The study of Bondner et al (2003)[23] revealed lower rate of episiotomy, a reduced use of medical analgesia and oxytocin in an upright position. A systematic review of Gupta et al (2004)[25] also showed that woman's being upright resulted in a shorter second stage, fewer assisted births and episiotomies. However, Bondner et al (2003)[23] observed that there was no change in the length of the first and the second stages of labor either in sitting or in side-lying positions.

Gupta et al (2004)[25] and Braun et al (2004)[26] also reported that sitting position was found to be favorable for fetal oxygenation and resulted in fewer fetal heart rate abnormalities. On the other hand, De Jonge et al (2004)[20] and Gupta

et al (2004)[25] suggested that an upright position resulted in more second degree perineal tears and more blood loss than in a supine position.

Although side-lying position relieved labor pains during an active phase of labor, sitting position enhanced uterine contractions and rupture of membranes in the present study. This finding was similar to Pilliteri (2007)[19] who stated that sitting position increased the pressure of fetal presenting part against the perineum and increased the uterine activity, leading to spontaneous rupture of membranes.

Although the results of this study revealed that side-lying position decreased the intensity of labor pains during the cervical dilatation from 6 to 8 cm, the study of Qian et al (2001)[16] illustrated that 4.4 % of women preferred sitting position and 70 % of vaginal births were done in supine position. Walsh (2000)[27] also mentioned that the compelling logic of gravity, meaning birthing in an upright position, should make us wonder how it has become routine practice to deliver in a semi-recumbent position. This may be a result of that the women often do what they think is expected of them, and media images tend to show women lying down during labor.

Kitzinger (2000)[28] would go as far as pronouncing that "birth is movement". Gould (2000)[29] would agree, saying that movement is a significant characteristic of normal labor. Cultures in which women are constrained and limited in their posture and positioning during labor are in fact, the exception rather than the rules. Many cultures use movements, dance, bathing and massage to encourage and sustain the process of labor.

Obstetric care has a history of unchecked practice which is one reason why interventions with little or no benefit continue to be used, and those with potential for improving outcomes and experiences are slow to be adopted. For example, evidence from researches

suggested benefits of being in side-lying position to relieve labor pains, yet 70 % to 80% of deliveries are done in traditional recumbent position.[30-32] Unlike, members of the Africa Midwives Research Network (AMRN) identified two obstetric procedures where current practice can improve and consequently have a direct impact on the quality of care women receive. Emerging research evidence suggests a potential benefit in being upright in the first stage of labor.[33] On the other hand; Munro and Spiby (2000)[34] recommended that midwives should encourage women to choose whatever position is most comfortable in labor and delivery.

CONCLUSION AND RECOMMENDATIONS

The results of this study concluded that side-lying position significantly reduced the intensity of labor pains during the active phase of labor. So, it is recommended that hospital policies should be formulated to support the use of intervention that was proven to be beneficial to women during childbirth and develop approaches that ensure clinical practice changes.

Evidence–based practices for management of labor pains should be encouraged. Therefore, side-lying position during labor needs further evaluation to be used as a method to manage labor pains and further researches are needed to study the clinical benefits and risks of various delivery positions as well as to examine the relationship between labor pains and ambulation during labor.

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