

EVALUATION OF THE EFFECTS OF ALTERNATE BIRTHING POSITIONS DURING SECOND STAGE OF LABOR ON MATERNAL AND PERINATAL OUTCOME

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ABSTRACT

Introduction: Earliest records of maternal birth positions show the parturient in an upright posture, usually squatting or kneeling. Where as in today's standards a mother has to lie down in dorsal position for the convenience of the health personnel. Dorsal position is not based on evidence and it comes with multitude of disadvantages and poor outcome.

Aims: To determine the benefits of alternate birthing positions during the second stage of labor and their effects on maternal and fetal outcome.

Materials and Methods: The present study was a Prospective Comparative Cohort Study. This Study was conducted from April 2021 to September 2022 (18 months) at Department of Labor Room of Chittaranjan Seva Sadan College of Obstetrics, Gynaecology and Child Health.

Result: Labor pain score assessment showed that women in Group A had lower pain as compared to women in Group B during second stage of labor. No significant difference was noted between the two groups in terms of mode of delivery. 98.7% women in Group A and 98.3% women in Group B had vaginal delivery. Fetal heart rate patterns, NICU admissions and APGAR score at 1 and 5 minutes after birth were not affected by maternal birthing positions.

Conclusion: From our study, it can be concluded that women who are given a choice to choose an alternate birthing position have better satisfaction and reduced intensity of labor pain. Also, there is reduction in the duration of second stage of labor and the need for episiotomy in alternate birthing position than the conventional dorsal position. Educating the health care professionals, midwives and nursing staff regarding the advantages of alternate birthing positions over dorsal position is important for a better labor care.

Keywords: Birthing positions, Second labor stage, maternal and perinatal outcome.

INTRODUCTION

Earliest records of maternal birth positions show the parturient in an upright posture, usually squatting or kneeling. Where as in today's standards a mother has to lie down in dorsal position for the convenience of the health personnel. Dorsal position is not based on evidence and it comes with multitude of disadvantages and poor outcome. This position is unscientific making birth unnecessarily complicated, cumbersome and in a way turning natural birth process into a medical event and the labouring women to become simply the body on the delivery table with the task to be relieved of their contents.

Certain maternal positions during the second-stage of labor have potential benefits in promoting optimal maternal and neonatal outcomes. Familiarity in managing maternal positions during this stage is essential to midwifery practice. Several evidence-based guidelines suggested that maternal positions serve as the non-medical intervention to facilitate the progress of childbirth. Assuming proper maternal positions can greatly improve their sense of control and enables them to foster a positive birth experience¹, thus helping them cope with labor easier and reducing negative psychological implications. Some kinds of maternal positions may shorten the duration of the second-stage of labor² thereby possibly minimizing the risk of complications. Certain maternal positions can even be applied to deal with obstetric complications. Conversely, adopting an unfavourable position, might cause women to suffer from a series of adverse outcomes, such as severe perineal trauma, post- partum urinary incontinence and greater blood loss³. The fetus or newborn is also faced with increased risk of complications.

World Health Organization has recommended the use of upright position for labor and childbirth Category A - and the supine-lithotomy as Category B - Therefore, identification of an optimal position is highly relevant and necessary to all women in labor and it should be a part of training of every skilled birth attendant. A Cochrane review examined duration of the second stage of labour, comparing limited birth positions (upright, birth-stool/squatting and birth chair/cushion) with supine/lithotomy positions, excluding water birth, mothers without epidural anaesthesia and studies from low-income countries. An update on this review was done in 2017. In our present study we compare few alternate birthing positions (flexible sacrum position) with conventional dorsal position. Even though the issue has frequently been studied; evidence related to alternative birthing positions is not well known. Among all clinical midwives, this knowledge helps them to encourage laboring women and their families to make informed

decisions regarding positions to be used in childbirth. In order for midwives to optimize their care for laboring women, there is a need for evidence to support and advocate for women during the labor and delivery process. Systematic review and meta-analysis with the objective of assessing the effect of maternal flexible sacrum birthing positions on duration of the second stage of labor show the benefits over conventional position.

Since no evidence exists to support the most ideal maternal positions for every woman, the maternal position has been controversial over a long period. As mentioned above, in earliest times, the most common position during labor and delivery has been some form of upright (or vertical) position⁴ Till the mid-seventeenth century, a French obstetrician Francois Mauriceau introduced semi recumbent position to women during labor for easy access in applying forceps. Then, this position was popularized in many developed and developing countries around the world and gradually evolved into recumbent or lithotomy position (or horizontal positions)⁵. Although it seems that adopting horizontal positions has become the norm, numerous studies found the advantages in horizontal positions outweighed by the disadvantages.

World Health Organization recommended upright position in 1996 and stated women should choose the maternal position according to their preference⁶. Although many researches have shed light on the use of different maternal position during the second-stage of labor, the pros and cons of each position might not be apparent.

MATERIALS AND METHODS

TYPE OF STUDY: Prospective Comparative Cohort Study

STUDY AREA: Labor Room of Chittaranjan Seva Sadan College of Obstetrics, Gynaecology and Child Health.

STUDY POPULATION: Our study was a prospective cohort study in which two groups was selected, study group A and study group B.

STUDY PERIOD: This study was carried out during the period April 2021 to September 2022 (18 months)

INCLUSION CRITERIA

1. Singleton pregnancy
2. Cephalic presentation with Vertex as presenting part
3. Adequate pelvis
4. Uncomplicated pregnancies going into second stage of labour
5. No contraindications to vaginal delivery

EXCLUSION CRITERIA

1. Multiple pregnancy
2. Patients undergoing trial of labour
3. Post-Caesarean pregnancy
4. Patients with history of PROM/Respiratory difficulties/ Fever
5. Heart disease in pregnancy
6. Patients receiving epidural anaesthesia

7. Other high-risk pregnancy like HDP, GDM etc.

Statistical Software

Sample size has been calculated with help of Epi Info (TM) 3.5.3. EPI INFO which is a trademark of the Centers for Disease Control and Prevention (CDC). For statistical analysis data will be entered into a Microsoft excel spreadsheet and then analyzed by SPSS 27.0. and Graph Pad Prism version 5. Data will be summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Unpaired proportions is compared by Chi-square test or Fischer's exact test, as appropriate. $p\text{-value} \leq 0.05$ will be considered for statistically significant.

RESULT AND DISCUSSION

The present study was a Prospective Comparative Cohort Study. This Study was conducted from April 2021 to September 2022 (18 months) at Department of Labor Room of Chittaranjan Seva Sadan College of Obstetrics, Gynaecology and Child Health.

Our study is a prospective comparative cohort study conducted on 600 women with uncomplicated singleton pregnancy going into second stage of labor, at a gestational age between 37 weeks to 40 weeks with an adequate pelvis, a live fetus with cephalic presentation and vertex as the presenting part and having no contraindications to vaginal delivery.

In our study, the distribution of patients according to age. Majority of women 62.5% belonged to an age group of 21 – 25 years, 17.5% women were less than 20 years of age, 19% women were of 26 to 30 years of age, and 6% women were between 31 to 35 years.

The distribution of patients by socioeconomic class, 45.8% women belonged to lower socioeconomic class, 52.5% women belonged to lower middle class, 0.8% women belonged to upper class and 5% women belonged to upper middle class.

In according to gravida, 68% women were primi gravida, 24.8% women were second gravida and 7.2% women were third gravida.

The frequency in which women chose one of the four alternate birthing positions in Group A. Out of 300 women in Group A, 133 women (44.3%) chose left lateral position, 118 women (39.3%) chose squatting position, 28 women (9.3%) chose kneeling position and 21 women (7%) chose all 4 or hands and knees position.

The World Health Organisation recommends that woman should be given an opportunity to make a choice on the type of position to use during labour.

The difference in satisfaction score among women in Group A and Group B. In Group- A, 72% women had a satisfaction score of 7 and 8 (Satisfied), 17.7% women had a score of 5 and 6 (Neutral) and 10.3% women had a score of 3 and 4 (Unsatisfied). In Group- B, 88.7% women had a satisfaction score of 5 and 6 (Neutral), 9.3% women had a score of 7 and 8 (Satisfied) and 2% women had a score of 3 and 4 (Unsatisfied).

In our study the difference in Satisfaction score between the two Groups was statistically significant ($p < 0.0001$).

Nieuwenhuijze MJ et al⁷(2013), in his study explored whether choices in birthing positions contributed to women's sense of control during birth. Out of 1030 women in his study, 204

women chose alternate birthing position and it was observed these women felt more in control of their birthing process which contributed to a positive experience of birth.

The distribution of mean duration of second stage labor between the two groups, In Group- A, the mean duration of second stage of labor was 31.7157 ± 7.0413 minutes, 25.3500 in all 4 positions, 27.4915 in squatting position, 34.2500 in kneeling position, 35.8872 in left lateral position. In Group- B, the mean duration of second stage was 37.0467 ± 6.0790 minutes. Distribution of mean duration of second stage of labor between the two groups was statistically significant.

Mathew A et al⁸(2012) in his randomized control study conducted on 60 primigravida mothers allocated into three groups - ambulation, birthing ball and control group respectively observed that there was a significant difference in second stage duration in the first two groups as compared to the control group. Also, the first two groups expressed that they were satisfied and comfortable during the birthing process.

Results of this study was comparable with our study which showed a significant reduction in duration of second stage labor in alternate birthing positions.

Labor Pain score in Group A and Group B. In Group- A, 0.7% patients had a Pain Score of 1,2 (mild pain), 63.0% patients had a Score of 3,4 (moderate pain), 32.0% patients had a Score of 5,6 (severe pain) and 4.3% patients had a Score of 7,8 (very severe pain). In Group- B, 7.7% patients had a Pain Score of 3,4 (moderate pain), 85.3% patients had a Score of 5,6 (severe pain) and 7.0% patients had a Score of 7,8 (very severe pain).

Labor Pain Score assessment between the two groups was statistically significant ($p < 0.0001$).

Vaziri F et al⁹(2016), in his study compared the effects of spontaneous pushing in the lateral position with the Valsalva manoeuvre during the second stage of labor on maternal and fetal outcomes. 69 patients were divided into the intervention group (35 subjects) and control group (34 subjects) and were analysed statistically. The mean pain (7.80 ± 1.21 versus 9.05 ± 1.11) and fatigue scores (46.59 ± 21 versus 123.36 ± 43.20) of the two groups showed a statistically significant difference ($P < 0.001$).

This was comparable to our study which showed that majority of patients in Group A with alternate birthing position had a lower pain score (moderate pain during labor) while most patients in Group B with dorsal position had significantly higher pain score (severe pain during labor).

Mode of delivery in both groups of patients. Majority patients in Group A and Group B delivered by vaginal delivery. Only 1.4% patients in Group A and 1.7% patients in Group B delivered by instrumental delivery which was not statistically significant.

The percentage of women who needed episiotomy in Group A and Group B. 63% women in Group A and 88.7% women in Group B required episiotomy and the difference between the two groups was statistically significant.

Distribution of perineal tear in Group A and Group B. In our study significantly higher number of perineal tears were noted in women with alternate birthing positions as compared to women in dorsal position. However, women who chose All 4, Kneeling and Left lateral positions had

higher incidence of 1st degree perineal tear while women in squatting position had higher incidence of 2nd degree perineal tear.

Waller-Wise R et al¹⁰(2020) conducted a study to evaluate a clinical practice guideline in second-stage labor with respect to positioning, timing of pushing, type of pushing effort, and the effect on birth method and perineal trauma. He observed that with change in maternal position, the rate of episiotomy decreased, the rate of perineal lacerations decreased, the rate of vaginal wall tears decreased, and the need for wound suturing of birth acquired lacerations decreased.

In my study the need for episiotomy was significantly lower in women with alternate birthing positions similar to the result noted in the above study, but the rate of perineal laceration was higher in these women as compared to those women delivering in dorsal position. This increase in rate of perineal laceration in Group A especially in squatting position was probably because of faster progress of labor and difficulty in maintaining adequate perineal support in this position.

Distribution in fetal heart rate patterns, NICU admissions and mean APGAR scores in Group A and Group B respectively. No significant difference was noted in fetal outcomes among the two groups.

Zwelling E et al¹¹(2010), evaluated the benefits of maternal movements and position changes to facilitate labor progress. It was observed that lack of maternal change in positions throughout labor can contribute to dystocia and increase the risk of caesarean births due to failure to progress or descend.

Yadav A et al¹²(2021) conducted a cross-sectional observational study on 52 nursing officers who were posted in the labour room to note their perspective on women's positions during labor. Majority (82.7%) of nursing officers felt that there is a need for giving a choice to the woman regarding alternate birth position. 76.9% of them were aware of the alternate birthing positions other than lithotomy. Around 48.1% would recommend squatting position to a woman in labour. They also noted that alternative birth positions are associated with lower rates of performing episiotomy, less perineal tears and less use of instrumental deliveries. Ease and convenience in conducting the delivery was the foremost reason chosen in advocating a birth position. Whereas overcrowding in the labour room, ignorance about alternate positions and difficulty in converting to instrumental delivery were cited as reasons of not recommending these positions.

Therefore, educating health care providers, midwives and nursing officers about emerging evidence regarding alternate birthing positions and their effects on labor is essential.

CONCLUSION

Alternate birthing positions are superior in promoting maternal wellbeing during child birth and tailors to individual woman's labor progress. Women should be encouraged to choose their birthing position which positively influences the childbirth experience and outcome of labor.

From our study, it can be concluded that women who are given a choice to choose an alternate birthing position have better satisfaction and reduced intensity of labor pain.

Also, there is reduction in the duration of second stage of labor and the need for episiotomy in alternate birthing position than the conventional dorsal position.

Educating the health care professionals, midwives and nursing staff regarding the advantages of alternate birthing positions over dorsal position is important for a better labor care.

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Table 1: Distribution of Alternate birthing positions in Group A

Birthing Position	Frequency	Percent
All 4	21	7%
Kneeling	28	9.3%
Left lateral	133	44.3%
Squatting	118	39.3%

Table 2: Distribution of mean Duration of 2nd stage (in minutes) in different birthing positions

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Birthing Position	All 4	20	25.3500	4.5685	13.0000	34.0000	26.0000	<0.0001
	Dorsal	300	37.0467	6.0790	20.0000	52.0000	38.0000	
	Kneeling	28	34.2500	5.7582	24.0000	44.0000	35.5000	
	Left lateral	133	35.8872	5.3253	20.0000	46.0000	36.0000	
	Squatting	118	27.4915	6.0831	14.0000	45.0000	28.0000	

Table 3: Labor Pain Score in Group A and B, Mode of Delivery and NICU Admissions in Group A and B

		Group- A	Group- B	TOTAL	Chi-square value	p-value
Labor Pain Score	1,2	2	0	2	206.5908	<0.0001
	Row %	100.0	0.0	100.0		
	Col %	0.7	0.0	0.3		
	3,4	189	23	212		
	Row %	89.2	10.8	100.0		
	Col %	63.0	7.7	35.3		
	5,6	96	256	352		
	Row %	27.3	72.7	100.0		
	Col %	32.0	85.3	58.7		
	7,8	13	21	34		
	Row %	38.2	61.8	100.0		

	Col %	4.3	7.0	5.7		
	TOTAL	300	300	600		
	Row %	50.0	50.0	100.0		
	Col %	100.0	100.0	100.0		
Mode Of Delivery	Outlet forceps delivery	2	5	7	3.2874	0.1933
		28.6	71.4	100.0		
		0.7	1.7	1.2		
	Row %					
	Col %					
	Vacuum delivery	2	0	2		
		100.0	0.0	100.0		
		0.7	0.0	0.3		
	Row %					
	Col %					
	Vaginal delivery	296	295	591		
		50.1	49.9	100.0		
	98.7	98.3	98.5			
Row %						
Col %						
TOTAL	300	300	600			
	50.0	50.0	100.0			
	100.0	100.0	100.0			
Row %						
Col %						
NICU admission	No	268	262	530	0.5822	0.4454
		50.2	49.8	100.0		
		89.3	87.3	88.3		
	Row %					
	Col %					
	Yes	32	38	70		
		25.0	75.0	100.0		
		10.7	12.6	11.7		
	Row %					
Col %						
TOTAL	300	300	600			
	50.0	50.0	100.0			
	100.0	100.0	100.0			
Row %						
Col %						

TABLE 4: Distribution of mean Duration of 2nd stage (min), APGAR Score at 1 and 5 minutes in Group A and B

		Number	Mean	SD	Minimum	Maximum	Median	P-value
Duration of 2nd stage (min)	Group-A	300	31.7157	7.0413	13.0000	46.0000	32.0000	<0.0001
	Group-B	300	37.0467	6.0790	20.0000	52.0000	38.0000	
APGAR at	Group-	300	6.9867	.1630	5.0000	7.0000	7.0000	0.2548

1 min	A							
	Group-B	300	6.9667	.2565	5.0000	7.0000	7.0000	
APGAR at 5 min	Group-A	300	8.9933	.1155	7.0000	9.0000	9.0000	0.316 5
	Group-B	300	8.9800	.1993	7.0000	9.0000	9.0000	