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Original Research Article

Effectiveness of Semi-Fowler's Position on Maternal Parameters and Fetal Heart Rate in Primigravid Women during Second Stage of Labour

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ABSTRACT

The position of a woman during labour has a significant influence on the course of labor, maternal comfort and maternal and fetal physiology. The present study was carried out to investigate the effect of maternal position during second stage of labour on maternal parameters and fetal heart rate among primigravid women.

Objectives of the study

1. To assess the maternal parameters and FHR in primigravid women in Semi-Fowler's position (Experimental group) and dorsal recumbent position (Control group) during second stage of labour using Partograph and Ultrasonic Doppler.
2. To compare the maternal parameters and FHR between experimental and control group during second stage of labour.

Methods: A quasi experimental research design was used for the present study. The sample consisted of 40 primigravid women (20 each in experimental and control group) who were selected by purposive sampling technique. Tools used were baseline proforma, Ultrasonic Doppler and Partograph

Results:

1. The Mean duration of uterine contraction at 30th minute in the experimental group was significantly higher than the control group during second stage of labour ($t=4.51$, $p<0.05$).
2. The Mean duration of second stage of labour in the experimental group was significantly lower than the control group ($t=13.03$, $p<0.05$).
3. The Mean FHR of the experimental group at 5th ($t=4.66$, $p<0.05$), 10th ($t=9.42$, $p<0.05$), 15th ($t=10.31$, $p<0.05$) and 30th ($t=8.69$, $p<0.05$) minute was significantly higher than the control group during second stage of labour.

Interpretation and conclusion: Findings of the study revealed that the Semi-Fowler's position has significant effect on duration of second stage of labour, uterine contraction and FHR of primigravid women. Hence it can be concluded that Semi-Fowler's position is an effective position both for the mother and fetus which can be used during second stage of labour.

Key words: Semi-Fowler's position; primigravid women; second stage of labour

INTRODUCTION

A woman's birth experience is consistently described as one of the most psychologically significant events of a woman's life and has been shown to impact the physical, psychosocial, and mental well-

being of mothers long after the birth of their child. [1]

Lamaze International (A non-profit child birth education organization) has identified six care practices, adapted from the WHO to promote, support, and protect normal birth. They are labour begins on its own, freedom of movement throughout labour, continuous labour support, no routine interventions, spontaneous pushing in upright or gravity-neutral positions and no separation of mother and baby, with unlimited opportunities for breastfeeding. [2]

WHO has categorised supine/ lithotomy position during labour and birth as category B- a practice clearly harmful, ineffective and should be eliminated in the practice and non supine as category A- a practice useful and to be encouraged. [3]

Today, majority of women deliver in supine, semi-recumbent or lithotomy position. It is claimed that the supine position enables the midwife/obstetrician to monitor the fetus better and thus to ensure a safe birth. The influence of medical personnel and institutions over the positions adopted by women during labour and birth has been viewed as inconsiderate of women's comfort and need to experience birth as a positive event, disempowering, abusive and humiliating. [4]

The investigator during her clinical experience observed that the women who attained upright position during labour were more comfortable than those in Dorsal recumbent position. During the literature search, it is found that only few studies are carried out in India regarding maternal position during labour. Keeping in view of the above findings and the investigators personal experience she developed an interest to compare the maternal and fetal parameters in both Semi- Fowler's and dorsal recumbent position during second stage of labour.

Objectives of the study

1. To assess the maternal parameters (frequency, intensity and duration of uterine contraction and duration of second stage of labour) and FHR in primigravid women in Semi-Fowler's position (Experimental group) and Dorsal recumbent position (Control group) during second stage of labour using Partograph, Ultrasonic Doppler and observation check list
2. To compare the maternal parameters and FHR between experimental and control group during second stage of labour.

MATERIALS AND METHODS

A quasi experimental research design was used for the present study. The sample consisted of 40 primigravid women (20 each in experimental and control group), who were selected by purposive sampling technique. Criteria laid down for the selection of subjects were:

Inclusion criteria

1. Primigravid women between the gestational weeks of 37-40
2. Primigravid women with cephalic presentation
3. Primigravid women augmented with Inj. Oxytocin.

Exclusion Criteria

1. Multiparous women.
2. Women with complications such as eclampsia, cephalo-pelvic disproportion, poly hydramnios and placenta previa.
3. Women who develop serious complications during labour such as abruption placenta and cord prolapse.
4. Abnormal presentations of the fetus like breech presentation.

5. Fetus with congenital anomalies such as hydrocephalus, anencephaly and spina bifida

Data collection instruments

Tool 1: Baseline proforma with 11 items

Tool 2: Partograph to record uterine contraction, FHR and duration of second stage of labour Tool 3: Ultrasonic Doppler to check FHR

Data collection process:

The investigator obtained a formal written permission from the authority concerned. Investigator explained the purpose of the study to the subjects and obtained the consent Prior to the data collection the investigator completed the baseline proforma from the clinical record and information from the subject. Subjects were continuously observed for bearing down sensation. When the women complained of bearing down sensation and stretching of the perineum, pervaginal examination was done to confirm complete cervical dilatation. Once the cervix was completely dilated (10 cm) the subjects were positioned either in Dorsal recumbent or Semi-Fowler's position randomly. After positioning the assessments and observations were done in the following manner.

a) Checking of uterine contraction: Uterine contraction was checked for 10 minutes duration in each interval (5th, 15th and 30th minute) by checking the tightening of the abdominal wall by placing palm of the hand over the fundal region of the abdomen. It was measured in terms of duration, intensity and frequency and plotted in the Partograph. The intensity was categorized and scored in the following manner:

Category	Duration of contraction	Scoring
Weak	< 20 seconds	1
Moderate	20-40 seconds	2
Severe	> 40 seconds	3

b) Duration of second stage of labour was calculated from complete cervical dilatation (10 cm) till expulsion of the fetal head and marked in the Partograph.

c) Checking of the FHR at 5th, 10th, 15th and 20th minute with Ultrasonic Doppler and plotted in the Partograph.

RESULTS

Part 1: Demographic variables

Most of the subjects in the experimental and control group were between 21-25 age group. Majority were Muslims (50% of the control group and 55% of the experimental group). 75% of the control group and 80% of the experimental group were homemakers. More than half of the subjects in both the groups had only basic education. Most of the subjects i.e. 95% of control group and 90% of experimental group had information regarding pregnancy and labour.

Part II: Comparison of maternal parameters between experimental (Semi-Fowler's) and control (Dorsal recumbent) group

a) Duration of uterine contraction

The findings of the study showed that there was a significant difference ($t=4.51$, $p<0.05$) in the the duration of uterine contraction at 30^{th} minute in experimental group (42 ± 5.95) and control group (38.5 ± 4.51). There was difference at 5^{th} and 15^{th} minute also, but were not significant.

Table 1: Frequency and percentage distribution of sample characteristics in experimental and control group. N=20+20

	Variables	Control f	Control %	Experimental f	Experimental %
1	Age [in years]				
	a. 18—20	4	20	6	30
	b. 21—25	7	35	7	35
	c. 26—30	7	35	6	30
	d. 31—35	2	10	1	5
2	Religion				
	a. Hindu	3	15	4	20
	b. Muslim	10	50	11	55
	c. Christian	7	35	5	25
	d. Other	-	-	-	-
3	Occupation:				
	a. Home maker	15	75	16	80
	b. Skilled worker	-	-	2	10
	c. Daily wager	2	10	1	5
	d. Professional	3	15	1	5
4	Education status:				
	a. No basic education	-	-	-	-
	b. Basic education	12	60	15	75
	c. PUC	4	20	4	20
	d. Graduate/ post graduate	4	20	1	5
5	Information regarding pregnancy and labour				
	a. Yes				
	b. No	19	95	18	90
		1	5	2	10
6	If YES source of information				
	a. Television	8	42.10	5	27.78
	b. Books, Journals and news papers	7	36.84	5	27.78
	c. Relatives and friends				
	d. Antenatal classes	19	100	18	100
		-	-	1	5.55
7	Gestational week				
	a. 37-40	18	90	17	85
	b. 41-42	2	10	3	15
8	Body weight of the mother				
	a. <40 kg	-	-	-	-
	b. 40-60 kg	10	50	12	60
	c. 61-80 kg	9	45	8	40
	d. >80 kg	1	5	-	-
9	Apgar Score 1st minute				
	a. >7	1	5	-	-
	b. 7-8	10	50	9	45
	c. 9-10	9	45	11	55
10	Apgar Score 5th minute				
	a. >7	-	-	-	-
	b. 7-8	-	-	-	-
	c. 9-10	20	100	20	100
11	Birth weight				
	a. <2.5 kg	1	5	2	10
	b. 2.5-3 kg	8	40	10	50
	c. 3.1-3.5 kg	8	40	7	35
	d. 3.6-4 kg	2	10	1	5
	e. >4 kg	1	5	-	-

Table 2: Mean, Standard Deviation and 't' value of duration of uterine contraction at 5th, 15th and 30th minute in experimental and control group

Sl. No	Time of assessment	Duration of uterine contraction Experimental Mean	Experimental SD	Control Mean	Control SD	't' value
1	5th minute	41.50	5.15	39.50	6.26	2.01
2	15th minute	40.75	5.91	39.25	6.54	1.92
3	30th minute	42.00	5.94	38.50	6.09	4.51*

$t_{(38)} = 2.021$, $p<0.05$, *= significant

b) Frequency and intensity of uterine contraction

Findings of the study showed insignificant difference in the frequency and intensity of the uterine contraction between experimental and control group.

Table 3: Mean, Standard Deviation and 't' value of frequency of uterine contraction at 5th, 15th and 30th minute in experimental and control group. N=20+20

Sl. No	Time of assessment	Frequency of uterine contraction				
		Experimental		Control		
		Mean	SD	Mean	SD	't' value
1	5th minute	4.10	0.55	4.25	0.72	0.60
2	15th minute	4.05	0.60	4.10	0.79	0.23
3	30th minute	4.00	0.73	4.10	0.85	0.37

$t_{(38)} = 2.021$, $p<0.05$

Table 4: Mean, Standard Deviation and't' value of intensity of uterine contraction at 5th, 15th and 30th minute in experimental and control group. N=20+20

	Time of assessment	Intensity of uterine contraction				
		Experimental		Control		
		Mean	SD	Mean	SD	't' value
1	5th minute	2.55	.51	2.45	.51	2.01
2	15th minute	2.35	.50	2.40	.49	.23
3	30th minute	2.50	.47	2.30	.51	.91

$t_{(38)} = 2.021$, $p<0.05$

c) Duration of second stage of labour

Mean duration of second stage of labour in experimental group (39.9±6.7) was significantly ($t=13.03, p<0.05$) less than the control group (54.5±17.8)

Table 5: Mean, Standard Deviation and 't' value for duration of second stage of labour. N=20+20

Duration of second stage of labour (in minutes)				
Experimental		Control		
Mean	SD	Mean	SD	't' value
39.9	6.70	54.5	17.89	13.03*

$t_{(38)} = 2.021$, $p<0.05$, *= significant

Part III: Comparison of FHR between experimental (Semi-Fowler's) and control (Dorsal recumbent) group

The study findings showed a significant difference the FHR between experimental and control group at 5th ($t=4.66$, $p<0.05$), 10th ($t=9.42$, $p<0.05$), 15th ($t=10.31$, $p<0.05$) and 20th ($t=8.69$, $p<0.05$) minute.

Table 6: Mean, Standard Deviation and 't' value of FHR at 5th, 10th 15th and 20th minute in experimental and control group N=20+20

Sl. No	Time of assessment	Fetal heart rate				't' value
		Experimental		Control		
		Mean	SD	Mean	SD	
1	5th minute	133.05	8.24	128.20	13.58	4.66*
2	10th minute	134.25	7.93	125.30	10.23	9.42*
3	15th minute	134.65	7.94	124.75	10.50	10.31*
4	20th minute	133.90	6.03	125.85	12.55	8.69*

$t_{(38)} = 2.021$, $p<0.05$, *= significant

DISCUSSION

I. Findings regarding sample characteristics

Among the subjects 35% were within the age group of 21-25 years and 52.5% were Muslims. Most of them (78.5%) were home makers. These significant findings could be because of the cultural and religious practice of early marriage which is followed in the Muslim community. Even though 67.5% had only basic education 87.5% of the subjects had information regarding pregnancy and labour from friends and relatives. This could be because of the strong family bond and relations that are maintained in the society. 45% of the newborns had birth weight between 2.6-3kg. The Apgar score of 5% subjects in Dorsal recumbent group was less than 7 during 1st minute where as in Semi-Fowler's position no subject had less than 7 score.

II. Findings regarding effect of Semi-Fowler's position on maternal parameters (uterine contraction and duration of second stage of labour)

In the present study Semi-Fowler's position had significant effect on duration of uterine contraction ($t_{(38)}= 4.51$, $p<0.05$) at 30th minute where as at 5th and 15th minute it was not significant. The reason for these findings was theorized to be the gravitational advantage of an upright position, which places greater pressure from the fetal head against the cervix (10-35 mmHg of increased pressure. [5]

The findings were supported by other studies which showed that the intensity of uterine contraction was higher among women delivered in a 30 degree upright position than among women delivered in a flat recumbent position and there was greater regularity of frequency of uterine contractions among women in the 30 degree upright position. [6]

Another major finding was the significant reduction in the duration of

second stage of labour in the Semi-Fowler's position ($t_{(38)}$=13.03, p<0.05). The Semi-Fowler's position takes the advantage of gravity to help the fetus to move down and results in reduction of duration of labour. In Semi-Fowler's position the fetal descent is enhanced with pressure of the thighs against the abdominal wall, thus stimulating the intrinsic bearing down efforts. The force exerted during bearing down is approximately 125 mm Hg in Dorsal recumbent position versus 135 mm Hg in Semi-Fowler's position. [5]

III. Findings regarding effect of Semi-Fowler's position on fetal heart rate.

The present study findings showed that the Semi-Fowler's position had significant effect on fetal heart rate at 5th (t=4.66), 10th (t=9.42), 15th (t=10.31) and 20th (t=8.69) minute. The reason for this finding could be the aortocaval compression caused by the gravid uterus in Dorsal recumbent position. A research study comparing the left lateral and supine position during labour discussed that aortocaval compression occurs in approximately one third of the parturients in supine position. [7]

In congruent with these findings in another study the results had shown that late decelerations were seen in only one mother with half-sitting, as compared to five mothers with supine position. Four infants of mothers giving birth in supine position had 1 minute Apgar scores 7 or less, where as all infants of mothers delivering in half-sitting position had Apgar scores higher than 7. [8]

IV. Other findings:

From the data it is found that 6 (30%) subjects in control group had fetal bradycardia during second stage of labour where as in experimental group only 1 (0.05%) subject had FHR less than120 betas/minute.

These findings were supported by another study finding in which the maternal half-sitting and supine position during the second stage of full term labour was compared in 100 women. The result had shown that late decelerations were seen in only one mother with half-sitting, as compared to five mothers with supine position. [8]

CONCLUSION

Position technique is a type of comfort measure identified as an important component of labour support. Proper positioning during second stage of labour enhances the comfort of labouring women and has the ability to promote fetal rotation and descent. Study findings reveal that Semi-Fowler's position has a number of advantages during second stage of labour. So, it can be one of the upright positions that can be adopted by women to have a labour in a 'HUMANISED WAY'

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