

A Comparative Study to Assess the Effectiveness of Left Lateral Position Vs Upright Position on Fetal Heart Rate and Labor Pain Among Parturient Mothers in I Stage of Labor in Government Hospital, Vellore

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Abstract

The main aim of the study was to do comparative study to assess the effectiveness of left lateral position vs upright position on fetal heart rate and labor pain among parturient mothers in first stage of labor at government hospital, Vellore. quasi experimental, comparative pre and post test design was adopted for the study. The sampling technique used was purposive sampling technique, and 60 parturient mothers were taken for study, out of which 30 parturient mothers were allotted to study group I and 30 parturient mothers in study group II. Data collection was done for a period of 1 month, assessment of demographic variables, fetal heart and perception of pain assessment were done with left lateral and upright position among parturient mothers in first stage of labour.

Keywords: Fetal Heart Rate and Labor Pain Among Parturient Mothers in Stage I of Labor.

Introduction

Pregnancy and childbirth are events that touch nearly every aspect of the human experience, biologic, psychological, social, and cultural. Child birth pain has been associated with pain since the beginning of time, and throughout history measures have been introduced to help relieve it. Pain during child birth is generally handled with pharmacological techniques. A non pharmacological technique for pain relief is generally a new concept. Among all the non-pharmacological techniques, positions are the one, which does not require the presence of a nurse as it can be performed by the mother itself.

Cochrane review focuses on maternal position for fetal heart, it helps to improve the blood supply to the baby. Left lateral positions is advantage for both maternal and fetus well-being, In fetus it helps to take pressure off the internal organs which means umbilical cord is less likely to get squished and

reduced baby's oxygen supply. It helps to keep baby's heart rate up, if it decreasing during contractions. In mother, it helps the mother to have low blood pressure, and it can help the mother to rest and relax if labor is taking a long time, no energy is wasted[1].

Obstetrical Gynecological survey reported that, women given in upright positions have more comfort and length of labor is shorter and fetal well-being is improved and it is considered to be more safe position[2].

Sylvia T. Brown undertaken a study and found that mean reduction of active phase of I stage of labor was 2 hours in parturient mothers. The mean duration of labor in experimental group was significantly less than the control group. The study concluded that, maintenance of upright positions (sitting and standing) during the first stage of labor reduces the duration of first stage of labor. So it is recommended that upright positions should be given to all laboring mothers if not contraindicated, it

reduces the duration of first stage of labor. Study of the effect of upright positions can be done on other aspects like maternal comfort, labor pains etc. Similar study can be replicated on large sample[3].

Wrightington etal states that the effect on upright positions during first stage of labor on maternal parameters, it increases comfort and reduce pain, labor may be shorter, gravity will help the baby to move down more easily and more quickly, upright positions can help with the frequency, length and efficiency of the contractions help to dilate more quickly on fetal effect, it helps to supply better oxygen to the fetus and improve the fetal heart rate[4].

Pillai & James observed the development of fetal heart rate acceleration patterns during normal pregnancy. They reported that, gestational age also a factor influencing acceleration or reactivity of fetal heart rate. The percentage of body movements accompanied by accelerations increased with gestational age[5].

Neilson conducted a study to assess the effects of antenatal fetal heart rate recordings on pregnancy outcome and management. The analysis provides no support for the use of Cardiotocograph which was as supplementary test of fetal wellbeing in the management of high risk pregnancies. He also comments that a cardiotocograph is an assessment of fetal wellbeing at that time and to expect such a test to produce a reduction in perinatal mortality in the manner of a screening test is unlimiting[6].

With regard to the position of women and the physiology of parturition, the importance is to regulate the effects of gravity on the fetus, which supports the muscle force during the period of expulsion. The efficacy of the muscle can be measured by frequency and intensity of the uterine contractions. Many times it is difficult to distinguish between the influence of gravity and the muscle force in several positions during parturition. However, it can be observed through a cause-and-effect interrelations for being upright during labor, women should be encouraged and help to move and adopt whatever positions they find most comfortable throughout labor.

Hence, there are lot of advantages in positioning the parturient women in first stage of labor, in either left lateral and upright position, this made the investigator to do comparative study to assess the effectiveness of left lateral and upright position on fetal heart rate and labor pain among parturient mothers.

Statement of Problem

A comparative study to assess the effectiveness of left lateral position vs upright position on fetal heart rate and labour pain among parturient mothers in first stage of labor at Government hospital, Vellore

1.4 Objectives

1. To assess and compare the effectiveness of left lateral position and upright position on Fetal heart rate and labor pain among parturient mothers in stage I of labor in study group I&II.
2. To correlate the fetal heart rate and labor pain of parturient mothers with left lateral position and upright lateral position during Stage I of labor in study group I&II.
3. To find out the association between the fetal heart rate and labor pain of parturient mothers with left lateral position and upright position during stage I of labor with demographic and obstetrical variables in study group I & II.

Methods and Materials

Methodology

Research Approach

The research approach used in this study was Quantitative approach.

Research Design

Quasi experimental comparative pretest and post test design.

Group	Pretest	Intervention	Post test
Study Group –I (Left lateral position)	✓	✓	✓
StudyGroup-II (upright position)	✓	✓	✓

Variables of the Study

Independent variables

Left lateral position and upright position.

Dependent variables

Fetal heart rate and labor pain of parturient mothers in stage I of labor.

Demographic variables

Age, education, religion, occupation, type of work, habitance

Obstetrical and gynaecological variables

Parity, gestational age, and cervical dilatation of parturient mothers.

Extraneous variables

Psychological factor of parturient mothers.

Research Setting

The setting for the study was Government hospital, Vellore. The hospital is 250 bedded, with all facilities for obstetric and gynaecological services. It has all the specialties, providing inpatient and out patient services. They have fully Pledged maternity facilities. They are conducting more than 300 deliveries in a month, approximately 10-12 deliveries per day, in which 70-80% of parturient mothers going for normal vaginal delivery with or without episotomy and so the hospital was selected to attain samples within the stipulated period of time.

Population

Population refers to the entire summation of case that meets the designed inclusion criteria. The population for the present study comprises of all the parturient mothers in I stage of labour.

Target population

It consisted of all the parturient mothers in I stage of labor.

Accessible population

It consisted of all parturient mothers in I stage of labor who are admitted in labor room of the

Government Hospital, Vellore, during the data collection period.

Sample

The study sample comprised of all parturient mothers admitted in labor room, who met the inclusion criteria

Sample Size

The size of sample was 60 parturient mothers out of which, 30 parturient mothers were allotted to study group I and 30 of them to study group II.

Sampling Technique

Purposive sampling technique was used to select the samples for the present study.

Criteria for Selection of Samples

Inclusive criteria

- Primi and multiparous parturient mothers who are in I stage of labour.
- Parturient Mothers with 3-6cm of cervical dilatation.
- Parturient mothers who are willing to participate in study.

Exclusive criteria

- Parturient mothers with maternal complications like pregnancy induced hypertension, gestational diabetes mellitus and cord presentation.
- Mal presentations & mal positions.
- Parturient Mothers who have taken oral and epidural analgesia during labor.

Development and Description of Tool

The tool was developed with an extensive review of literature, discussion with professional experts and with the investigator's personal experience and a structured questionnaire was used. The tool consists of the three parts, section A, section B, and section C.

Section–A. Structured questionnaire was used to assess demographic and obstetrical variables. The demographic variables include age, educational status, occupation, income, type of family, religion and obstetrical variables include parity, gestational age and cervical dilatation.

Section–B. Fetal heart rate was assessed by doppler machine and values are entered in observational schedule prepared by the investigator.

Section–C. Pain of parturient mothers was assessed by combined numerical and categorical pain scale (Derry S et al., 2008).

The combined numerical and categorical pain scale was used to assess the pain perception. The scale assessed the subjective response of the pain intensity of the parturient mothers. It includes the numerical and categorical description of the level of pain, which ranged from '0' – (no pain) to '10' (worst possible pain).

Major findings

Regarding the demographic variables of parturient mothers in study group I

The major findings of demographic of parturient mothers age, 9 (63.3%) were between 21-25yrs, the educational qualification of parturient mothers, 11 (36.7%) were intermediate, occupation clerical shop owners, 12 (40.0%), the type of family, 15 (50.0) of them belonged to nuclear family, and 15 (50.0%) belonged to joint family. Income 13 (43.3%) were earning less than Rs 5,000/-month, The residence, 24 (80%) were residing in rural area., religion, 20 (66.7%) were Hindu .

Regarding the demographic variables of parturient mothers in study group II

The major findings of demographic variables in parturient mothers in study group II. The age distribution of parturient mothers were 18 (60.0%) between 21-25 years, the educational qualification of parturient mothers, 5 (50.0%) were intermediate, occupation, 15 (50.0%) were skilled workers, the type of family of parturient mothers, 16 (53.3) of them belonged to nuclear family, income 16 (53.3%) were earning less than Rs5,000/-month, the residence of parturient mothers, 24 (80.0%) mother who were residing in rural area. With respect to religious status of parturient mothers, 23 (76.7%) of them belong to Hindu.

Regarding the obstetrical Information of Parturient Mothers in Study Group I

The major findings of obstetrical variables of parturient mothers in study group I, the parity of parturient mothers, 20 (66.7%) were having one child, the gestational age of parturient mothers, 9 (30.0%), of them were in 40 weeks, the cervical dilatation of parturient mother 23 (76.7%) of them were between 3-4cm cervical dilatation,.

Regarding the obstetrical variables of parturient mothers in study group II

The major findings of obstetrical variables of parturient mothers in study group II, the parity of parturient mother, 20 (66.7%) belong to one child, the gestational age of parturient mother 9 (30%) were in 38 weeks, the cervical dilatation of parturient mothers, 25 (83,3 %) were between 3-4 cm cervical dilatation

Table 1: Comparison of post test level of mean and standard deviation of fetal heart rate and pain score of parturient mothers in I stage of labor with left lateral and upright position between study group I & II **N=60**

	Study Group I n=30		Study Group II n=30		Student's independent t-test
	Mean	SD	Mean	SD	
Fetal Heart Rate	136.00	9.08	149.17	10.53	t=2.82 P=0.01** df=58, significant
Pain	3.07	2.99	4.96	2.56	t=2.63 P=0.01** df=58 significant

** highly significant

The results depicted that, there was significant difference found in fetal heart rate of parturient mothers in study group I & II at P = 0.01 level.

Regarding the labor pain of parturient mothers in study group I & II, there was Statistical significance found at P = 0.01 level.

Table 2: Comparison of mean and standard deviation of pretest level and post test level of fetal heart and labor pain of parturient mothers in I stage of labour with left lateral position in study group I

Variables	Study group I				Paired t test
	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	
Fetal heart rate	130.6	6.41	136	9.08	t=6.933 df=28 p=0.001***
Labour pain	7.1566	1.644	3.07	2.99	t=22.20 df=28 p=0.001***

*** very high significance

Analysis sho

Analysis showed that comparison of mean and standard deviation of pre-test level and post- test level of fetal heart rate of left lateral position in study group I was very highly significant at P=0.001 level and

comparison of pre test level and post level of labor pain of parturient mothers mean and standard deviation of pre and post test level of labor pain in study group I was very highly significant at P=0.001 level.

Table 3: Comparison of mean and standard deviation of pretest and post test level of fetal heart and labor pain of parturient mothers in I stage of labor with I upright position in study group II

Variables	Study group II				Paired t test
	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	
Fetal heart rate	131.53	6.27	149.17	10.53	t=24.42 df=28 p=0.001***
Labour pain	7.28	2.08	4.96	2.56	t=7.99 df=28 p=0.001***

*** very high significant

Table 4: Correlation of fetal heart rate and pain score of parturient mothers in I stage of labor with left lateral and upright position in study group I&II
N= 60

	Correlation	Mean ±SD	Correlation coefficient	Interpretation
StudyGroupI	FHR vs pain score	139.00±3.07	r=0.51 p=0.01**	Moderate correlation
StudyGroupII	FHR vs pain score	146.17±4.96	r=0.42 p=0.01**	Moderate correlation

** highly significant at Pd*0.01

Analysis depicted revealed that, mean and standard deviation value was 139.00 ±3.07 and the correlation was r =0.51 which was statistically significant at 0.01 level. There was a moderate positive correlation found between the fetal heart rate and pain perception of parturient mothers in study group I. The correlation of post test of fetal heart rate and pain score among parturient mothers in study group II revealed that, mean and standard deviation value was 146.17 ±4.96 and the correlation was r =0.42 which was statistically significant at 0.01 level. There was a moderate positive correlation found between the fetal heart rate and pain perception of parturient mothers in study group II

Analysis revealed that, In study group I there was significant association found between fetal heart rate and demographic variables such as age and parity among which younger age and more parity mothers has high significant association at p=0.01 and there was no significant association found between Fetal heart rate with other demographic variable such as educational status, occupational status, type of family, monthly income, habitence, religion, obstetrical variables such as cervical dilatation and, gestational weeks.

Table 5: Association of Fetal heart rate with demographic and obstetrical variables of parturient mothers in I stage of labor with left lateral position in study group I. N=60

Demographic variables		Fetal Heart Rate (n=30)						Total	Chi square test
		120-130		130-140		140-150			
		No.	%	No.	%	No.	%		
Age	<20years	0	0.0	5	71.4	2	28.6	7	$\chi^2=18.06$ p=0.01**
	21-25years	4	21.1	14	73.6	1	5.3	19	
	26-30years	0	0.0	0	0.0	2	100.	2	
	31-35 years	0	0.0	0	0.0	2	100	2	
		Obstetrical variable							
Parity	One	0	0.0	14	70.0	6	30.0	20	$\chi^2=9.85$ p=0.01**
	Two	3	37.5	4	50.0	1	12.5	8	
	Three	1	50.0	1	50.0	0	0.0	2	

** highly significant at Pd<0.01

Table 6: Association of Fetal heart rate with demographic & obstetrical variables of parturient mothers in I stage of labor with upright position in study group II N=60

Demographic variables		Fetal heart rate (n=30)				Total	Chi square test
		130-140		140-150			
		No.	%	No.	%		
Age	< 20yrs	2	40.0	3	60.0	5	$\chi^2=9.18$ p=0.03
	21-25yrs	14	77.8	4	22.2	18	
	26-30yrs	1	20.0	4	80.0	5	
	31-35yrs	0	0.0	2	100	2	
		Obstetrical variable					
Cervical dilatation	3-4cm	17	68.0	8	32.0	25	$\chi^2=10.67$ p=0.01*
	5-6cm	0	0.0	5	100	5	

* significant at Pd<0.05

Analysis depicted that, in study group II there was significant association found between fetal heart rate and demographic variables such as age and cervical dilatation, among which younger mothers and mothers with 3-4cm dilatation had high significant association

at P=0.01 level and there were no significant association found with other demographic variables such as educational status, occupational status, type of family, monthly income, habitence, religion, obstetrical variables such as parity and gestational weeks.

Table 7: Association of pain score with demographic and obstetrical variables of parturient mothers in I stage of labor with left lateral position in study group I N=60

Demographic variables		Pain (n=30)								Total	Chi square test
		No pain		Mild		Moderate		Severe			
		No	%	No	%	No	%	No	%		
		Obstetrical variable									
Parity	One	1	5.0	10	50.0	4	20.0	5	25.5	20	$\chi^2=12.64$ p=0.05*
	Two	5	62.5	2	25.0	1	12.5	0	0.0	8	
	Three	1	50.0	1	50.0	0	0.0	0	0.0	2	
Cervical dilatation	3-4cm	7	30.4	11	47.8	3	13.0	2	8.7	23	$\chi^2=7.97$ p=0.05*
	4-5cm	0	0.0	2	28.6	2	28.6	3	42.9	7	

* significant at Pd<0.05

Analysis showed that, in study group II there was high significant association found between demographic variables such as parity and cervical dilatation among which mothers of more parity mothers had highly significantly association at

P=0.05 and there was no significant association with demographic variables such as age, educational status, occupational status, type of family, habitence, religion and obstetrical variables such as, gestational weeks and cervical dilatation.

Table 8: Association of pain score with demographic and obstetrical variables of parturient mothers in I stage of labor with upright position in study group II N=60

Demographic variables		No pain		Pain (n=30)				Total	Chi square test	
		No.	%	Mild No.	Mild %	Moderate No.	Moderate %			Severe No.
Age	<20years	0	0.0	0	0.0	1	20.0	4	80.0	$\chi^2=16.96$ p=0.05
	21-25yr	3	16.7	6	33.3	7	38.9	2	11.1	
	26-30yr	0	0.0	0	0.0	1	20.0	4	80.0	
	31-35 yr	0	0.0	0	0.0	0	0.0	2	100.0	
		Obstetrical variable								
Cervical dilatation	3-4cm	3	12.0	6	24.0	3	36.0	7	28.0	$\chi^2=9.00$ p=0.02*
	4-5cm	0	0.0	0	0.0	2	0.0	5	100.0	

* significant at Pd<sup>0.05

Analysis revealed that, in study group II, revealed, that there was significant association found between demographic variables such as age and cervical dilatation among which mothers of younger age and with less cervical dilatation was highly significant association at P=0.05 and there was no significant association found in mothers with age, educational status, occupational status, type of family, income, habitence, religion, parity & gestational age.

Discussion

The present study compared the effectiveness of left lateral position vs upright position on fetal heart rate and labor pain among parturient mothers in I stage of labor in Government hospital, Vellore. The results of the study revealed that, the comparison of post test mean and standard deviation of fetal heart rate and pain score of parturient mothers in study group I and II was statistically significant at P=0.01 level. The parturient mothers who adopted left lateral position had normal range of fetal heart rate and the pain score was less in left lateral position. The results of the study proved that, left lateral position was more effective than upright position during labor

Nursing implication

This section of the research report that focuses on nursing implication, which includes specific suggestion for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

- As a member of the health team, nurses play a vital role in providing comfort to parturient mothers in I stage of labor.

- Nurses should be aware of effects of positions during labor.
- Nurses should create an awareness and motivate others in the team to teach regarding labour process in reducing the fetal distress and labor pain among parturient mothers in I stage of labor.

Nursing Education

- A continuing nursing education program can be arranged on positions during for labour to assess fetal heart rate and pain perception.
- A nurse educator should gain knowledge on various non-pharmacological methods of pain relief during labor.
- A nurse educator should make use of available literatures and studies related to measures to maintain fetal heart rate normal and to reduce labour pain.
- A nurse educator should encourage the students for effective utilization of research based practice.

Nursing administration

- Conduct in service education program on the effectiveness of positions to maintain fetal heart rate and to reduce pain among parturient mothers in I stage of labour.
- Arrange and conduct workshop, conferences and seminars on adopting different positions of parturient mothers in I stage of labour.
- Provide opportunities for midwives to attend training program on benefits of positions during I stage of labor among parturient mothers.

Nursing research

- As a researcher, promote more research on positioning to maintain fetal heart and reduce pain perception in I stage of labor among parturient mothers.
- Disseminate the findings of the research through conferences, seminars and publishing in nursing journal.
- Promote effective utilization of research findings on management to maintain fetal heart rate and reduce labor pain I stage of labor among parturient mothers.

Recommendations

- A similar study can be undertaken to do comparison to assess the effectiveness of left lateral position and upright position on fetal heart rate and labor pain among parturient mothers in II stage of labor.
- A comparative study can be done on various other positions to assess the fetal heart rate and labor pain among parturient mothers in I stage of labor .
- The study can be done with large samples so that the results can be generalized.

- The same study can be done on different settings.

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