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COMPARATIVE STUDY BETWEEN UPRIGHT AND LYING DOWN POSITION DURING -A STEP TOWARDS RESPECTFUL MATERNITY CARE

Dr Deepika Sharma,[1] Dr Dipansha Bajpayi,[2] Dr Pratibha Dixit,[3] Dr Devendra Nargawe[4*]

[1]MBBS, MS, Assistant Professor, Department of Obstetrics and Gynecology, LNCT Medical College and Sewakunj Hospital Indore, Madhya Pradesh
[2]MBBS, MS, Senior Resident, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Ratlam, Madhya Pradesh
[3]MBBS, MS, Associate Professor, Department of Obstetrics and Gynecology, Government Medical College and Hospital, Ratlam, Madhya Pradesh
[4]MBBS, MD, Associate Professor, Department of Paediatrics, Government Medical College and Hospital, Ratlam, Madhya Pradesh*

Address for correspondence:Dr Devendra Nargawe
dev.nargawe@gmail.com

ABSTRACT

Background: Women are gives birth usually on bed in recumbent positions. in healthcare facilities, Having choices and being involved in decision making contributes to women's positive childbirth experiences. During a physiological birth, women's preferences can play a leading role in the choice of birthing positions.

Objectives: The present prospective clinical study was aimed to comparatively evaluate the differences in the upright and lying down position during childbirth. The study also aimed to study maternal outcome in upright and recumbent position, to study perinatal outcome with respect to APGAR score, need for mechanical ventilation, and to compare the upright positions with traditional position.

Methods: A prospective comparative study was conducted. Participants were counseled about positions and companion. Women were assigned to their willing positions. Main outcome variables measured are the duration of second, third stages of labor and amount of blood loss, spontaneous or operative vaginal delivery, perineal trauma and need for episiotomy, maternal satisfaction, need of LSCS, and fetal outcome.

Results: The analysis showed that non-supine position had lower rates of caesarean section. Duration of first and second stage of labor was shorter in non-supine position. Patient satisfaction in terms of reported discomfort is more in non-supine positions. Postpartum hemorrhage, perineal trauma and need of episiotomy were less in non-supine position.

Conclusion: Based on this study, we recommend that women in low-risk labor should be informed of the benefits of upright positions, and encouraged and assisted to assume upright positions.

Keywords: Birthing positions, Childbirth, delivery, supine position, LSCS

INTRODUCTION

A satisfying childbirth experience is influenced by women's self-control, labour pain perception, expectations, and health care support. The possibility to change the position in

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labour might positively influence childbirth experience and also the good course and outcome of labour.[1]

Several advantages have been claimed for non-recumbent labour, thanks to "gravity effect" on uterine perfusion, on contractions effectiveness, and on fetal alignment to the pelvic angles and diameters.[2]

In the first stage of labour vertical positions seem associated with lower pain, reduced labour length, and perception of physiological event, resulting in increased women's comfort and satisfaction after childbirth. These evidences have been confirmed in a recent meta-analysis revealing that vertical positions are also associated with a lower analgesia request and necessity of interventions.[3]

Although some authors reported no effect of maternal position on labour length a significant reduction in length of both first and second labour stages was found in our patients assuming alternative positions and confirming a possible favouring effect of gravity in effective uterine contractions and fetal alignment to the birth canal. Episiotomy, operative vaginal delivery, and severe vaginal tears rate confirmed in our series of cases previous evidences regarding the positive effect of alternative position.[4]

This finding can be related to better and gradual maternal perineum compliance to the fetal head descent, reducing anatomical and functional perineal damage and consequent dyssynergia. Vertical positions are burned to more difficult medical management when peculiar conditions (amniotomy, oxytocin induction, fetal monitoring, and uterine contraction tracings) and interventions (epidural analgesia) are required positions appeared helpful in foetal head rotation during labour, reducing the rate of operative vaginal deliveries and CS.[5]

Thus, in a very schematic presentation, positions for giving birth are classified into two main groups, depending on the angle made by the horizontal plane and the line linking the midpoints of the third and fifth lumbar vertebrae. When this line is greater than 45, the position is considered upright or vertical. It is labeled horizontal when this angle is less than 45. The squatting, seated, suspended or standing positions, with their variants are therefore in the category of positions considered upright, while the dorsal decubitus, lithotomy, gynecological, and lateral positions and their variants are considered horizontal.[6]

There are various advantages of delivering in an upright position including assistance of gravity helping passage of the baby through the birth canal, decreased compression of the blood vessels in the abdomen, improving the strength and efficiency of contractions, improved alignment of the baby with the passage through the birth canal, thus allowing the woman to 'bear down' in the direction of the baby's movement, and increased width of pelvic outlet.

MATERIALS AND METHODS

The present prospective clinical study was aimed to comparatively evaluate the differences in the upright and lying down position during childbirth. The study also aimed to study maternal outcome in upright and recumbent position, to study perinatal outcome with respect to APGAR score, need for mechanical ventilation, and to compare the upright positions with traditional position.

The inclusion criteria for the study were term (>37 wks) patient giving consent for participation in study, only primi and second gravida subjects, no associated medical and

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surgical illness, and patient having no contraindication for vaginal delivery. The exclusion criteria for the study were patients who did not give consent, patient having any medical or obstetric risk factor, and the patient with previous scar.

The study was done in the labour room with a total of 500 normal low risk primigravida or second gravida patients between 38 - 42 weeks of gestation with single vertex fetus in anterior position, adequate pelvis, presenting in active labor.

The women were assigned to their positions of choice; all patients were mobile during the first stage of labour. Women were free to walk about, sit up or lie in bed as they wished and a similar number of patients in another group spent the first stage predominantly lying down.

Upright second -stage position include squatting, kneeling and sitting upright. All women in the study group were asked for consent as soon as possible after admission. However, the parturient could decide to adopt a conventional, recumbent second stage position at any time.

Active second stage was timed from when the bearing down efforts started, bearing down was usually encouraged when the parturient started to feel the urge to push. There was no arbitrary time limit for the duration of second stage, the usual indication for operative delivery was fetal distress, maternal exhaustion, obvious failure to progress. Episiotomy was not done routinely but was usually done to avoid a potentially greater tearing or expedite delivery if it was thought necessary. Blood loss was estimated visually.

The third stage of labour was conducted in the semi reclining position with head end raised.

The main outcome variables measured were the duration of first, second, third stages of labour, need of operative intervention, blood loss, need of episiotomy and fetal outcome with respect of APGAR score at 5 minutes, need of resuscitation or NICU admission.

The two groups were compared. Statistical analysis was done with help of chi square test, t test with the SPSS software version 21.0. The significance level was kept at $p<0.05$.

RESULTS

Total number of patients participated in the study were 450. They were distributed in 2 groups one is upright and other is dorsal and results were drawn out. Total 250 patients were in upright group in which 176 patients had taken squatting position, 64 were taken sitting and remaining 10 had taken kneeling position. Total 200 patients were from dorsal group.

The difference between mean of first stage in each group was significant which shows that by allowing woman to remain upright even in first stage will help in reducing duration of first stage. Similarly difference in the duration of second stage was significantly lower in upright groups which is because of additional effect of gravity during labour in upright position whereas in recumbent position where the baby has to deliver against the gravity. The duration of third stage was equal in both groups (Table 2).

The table 3 shows that need of episiotomy was more in recumbent group as compared to upright group and the result was significant statistically which might be because many episiotomies were given in lithotomy position before crowning where it may be unnecessary and if baby was allowed to delivered in those cases without episiotomy it might cause 1st degree tear or no tear. Whereas the need of operative intervention including both forceps or ventouse was almost equal and the difference was not significant statistically.

Table 4 shows that first degree tear was more in upright position (20%) as compared to recumbent position (14%) but the difference was not significant statistically, it was because

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of a smaller number of episiotomy but many of them don't even require suturing. But frequency of second- and third-degree tear was more in dorsal group the difference was not significant. The frequency of labial tear was more in upright group and the difference was significant this is because of resultant force of presenting part over perineum which is more towards anteriorly in upright position as compared to recumbent position where the force was more towards posterior perineum. In case of paraurethral tear it was seen only in upright in 1.2% cases and not seen in any case in dorsal and again the reason is more force towards anterior perineum.

In this study total number of CS done in lithotomy position is 4.5% whereas in upright group is 0.8% all the section done are in second stage. In recumbent position among all the sections done, 7 sections done is for fetal distress whereas in upright group only one section done for fetal distress which indicate that fetal heart abnormality is more in recumbent group as compared to upright group which is because of compression of vessel supplying uterus (Table 5).

With respect to fetal outcome in our study number of babies had APGAR score <5 at 1 minute was less in upright group but the difference was not significant. Similarly, number of babies required resuscitation and number of babies required NICU admission was more in recumbent group but the difference was not significant.

Maternal satisfaction was assessed by questionnaire including various questions and patients were asked to answer in form of strongly agreed, agree, neutral, disagree or strongly disagree. In this questionnaire mostly the patients are satisfied with this position, satisfy with staff and their communication with the patients. Patients were able to move as much as they wanted more in upright position. They are satisfied with overall birth experience in both the groups. In all the cases more patients are satisfied in upright group than recumbent group (Table 6).

DISCUSSION

In our study duration of first stage of labour in upright group is 5.578 hrs and in recumbent group is 5.931 hrs and the difference between then them is statistically significant. Similarly, the duration of second stage of labour in upright group is 36.42 minutes and in 39.53 minutes and the difference is statistically significant. Similar results were seen in study done by Ganapathy et al[7] in 2012 there was a significant decrease of 11 minutes in the duration of second stage of labour among women in supported sitting posture as compared to supine-lithotomy.

In our study total number of instrumental deliveries is less in upright group 6(3%) as compared to recumbent group 5 (2%) and the difference is in significant. But in study done by Moraloglu O et al[8] in 2017 the rate of instrumental deliveries by forceps or vacuum was fewer among the participants in the supported sitting group 8 (8%) as compared to lithotomy position group 42 (42%) and none of the participants in both the groups underwent lower segment caesarean sections.

In our study mediolateral episiotomy was given in 22.5% cases in recumbent group whereas in upright group it was given only in 7.2%and the difference is statistically significant. But in study done by Moraloglu O et al[8] in 2017 Right mediolateral episiotomy was given to all the participants in both the groups and there was no significant. In study done by Gupta JK et al[9] in 2017 episiotomy was given to 100% in recumbent group but in upright group it was given

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to 32.7% and the difference was significant. This indicates that need of episiotomy can significantly reduced with upright position. So, a prospective observational study was done to evaluate the effects of such upright position with the conventional recumbent position. The main outcome variables were the length of first and second stage, frequency of operative vaginal delivery, blood loss, perineal damage and post-partum oedema.

In our study 1st degree tear was seen in 20% cases in upright group but it was less in recumbent group 14.5% but the difference was significant. But 2nd degree tear was seen more in recumbent group 8% as compared to upright group 6% but the results were not significant. Similarly, 3rd degree tear was seen more in recumbent position 1.5% as compared to upright group 0.8%. No other study considered this point but this is because of less episiotomy where when episiotomy was not given but only first-degree tear has happened which either don't requiring or few stitches were required.

In our study labial tear was seen more in 14.4% in upright position as compared to recumbent position 6.5% The higher rate of intact perineum occurred at the expense of more labial lacerations during squatting, a welcome trade-off, since the latter usually heal quickly and rarely require suturing. Possibly, more labial tears occur because of a more anterior transit of the fetal head at delivery, helped by a greater sub pubic angle. In study done by Ganapathy et al[7] in 2012 there was no significant difference in occurrence of perineal lacerations, paraurethral, cervical or anal sphincter tears among both the groups. The results were similar to the study by and Nasir A et al[10] in 2007 who assessed the effects of upright versus supine position during delivery among low-risk term parturient.

In our study total number of caesarean sections done in upright group is 0.8% which is much lower than recumbent group which is 4.5% the difference was not significant. All the sections done for second stage and most of the sections done in recumbent group is for fetal distress and one section done for non-progress and the difference in both the group for fetal distress was significant which indicate that chances of abnormal heart rate pattern were more in recumbent group which is because of compression of uterine artery. Similarly, in Ganapathy et al irregular fetal heart rate patterns were observed among 7 (7%) of the primigravidae in the supported sitting group as compared to 13 (13%) of the primigravidae in the supine-lithotomy group with the significant mean difference of "t" = 4.32, $p<0.001$.

In our study mean blood loss was more in upright group as compared to recumbent group and the difference is not statistically different. Also, blood loss>500 ml was seen more in upright group 31.6% as compared to recumbent group 26% but the difference was not statistically significant. Same results were seen in study done by Clarke M et al[11] in 2007 and Carseldine WJ et al[12] in 2013 estimated average amount of blood loss was 340 ml among women who delivered in supported sitting as compared to 330 ml in supine-lithotomy position and none of the participants in both the groups had a blood loss more than 500 ml. Though the blood loss was 10 ml more in the supported sitting group, the difference did not reach significance. Similar findings were seen in study conducted by SomSripang P et al[13] in 2014 who evaluated the outcomes of an upright versus supine position during the second stage of labour among 307 low risk term primigravidae who delivered in upright and 307 women who delivered in supine position. The results of the study showed that there was no significant difference in the average amount of blood loss between the two groups.

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The APGAR scores of the newborns at 1 minute (8.7 versus 8.4) and 5 minutes (9.9 Vs 9.7) were significantly higher in the supported sitting group than the lithotomy position. This study finding is similar to the non-randomized clinical trial by Cheng YW et al[14] in 2017.

CONCLUSION

A simple elevation of the back of the labouring women with the easily available, low-cost resources of backrest that maximizes the important benefits of the gravity offers greater advantages to the low -risk mothers in terms of enhanced comfort, shorter duration of second, third stages of labour, insignificant amount of blood loss and safe birthing experiences. In our country the cost-effective interventions are must to deal with the normal process that would work with the natural physiological principles in terms of acceptability, affordability, feasibility and availability to all women. Health care professionals have an important responsibility to promote comfort during labour and birth and should strive to bring a paradigm shift from the routine supine/lithotomy position that works against gravity to women cantered, gravity-oriented supported sitting upright position by educating the women and their family before delivery, about the benefits and conducting normal vaginal deliveries in simple upright position to promote maternal and perinatal outcome of labour.

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TABLES

Supine position	Lateral (Sim's) position. Semi-recumbent (trunk tilted to30º to the horizontal). Lithotomy position. Trendelenburg's position (head lower than pelvis).
Neutral position	Line connecting the center of a woman's third and fifth vertebrae is more horizontal than vertical
Upright position (with gravity involved)	Sitting (obstetric chair/stool) Kneeling Squatting unaided or using squatting bars Squatting aided with birth cushion or partner

Table 1: Atwood's Classification of birthing position:

Group		N	Mean	Std. Deviation	p value
Duration of 1 st stage	**Upright**	250	5.578	.3649	.0001
	Dorsal lithtomy	200	5.931	.4812	
Duration of 2nd stage	**Upright**	250	36.42	5.676	.0001
	Dorsal lithtomy	200	39.53	9.071	
Duration of 3 rd stage	**Upright**	250	5.00	.000[a]	
	Dorsal lithtomy	200	5.00	.000[a]	
P value=0.0001 significant					

Table No. 2 Duration of labour in different stages of labour.

			Group		
			Dorsal lithotomy	**Upright**	**Total**
Need of episiotomy	**Yes**	**Count**	45	18	63
		%	22.5%	7.2%	14.0%
	No	**Count**	155	232	387
		%	77.5%	92.8%	86.0%
Total		**Count**	200	250	450
		%	100.0%	100.0%	100.0%
Chi-square= 21.603, p value= 0.0001					

Table No. 3 Distribution of episiotomy in both groups.

Tear	**Group**	**Total**	**p value**

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		Dorsal lithotomy	Upright		
1st degree	**Count**	29	50	79	
	%	14.5%	20.0%	17.6%	0.128
2nd	**Count**	16	15	31	
	%	8.0%	6.0%	6.9%	0.405
3rd	**Count**	3	2	5	
	%	1.5%	.8%	1.1%	0.66
Labial Tear	**Count**	13	36	49	
	%	6.5%	14.4%	10.9%	0.008
Para urethral Tear	**Count**	0	3	3	
	%	0.0%	1.2%	.7%	0.258

Table No. 4 Distribution of different tear in both groups.

			Group		Total
			Dorsal lithotomy	Upright	
Type of delivery	**CS**	**Count**	6	3	9
		%	3.0%	1.2%	2.0%
	No CS	**Count**	194	247	441
		%	97.0%	98.8%	98.0%
Total		**Count**	200	250	450
		%	100.0%	100.0%	100.0%
Chi square= 1.837, p value= 0.175					

Table no: 5 Distribution of caesarean section done in both groups.

	Upright (250)	**Recumbent (200)**
Satisfied with overall childbirth experience:		
Strongly agree	47.2 %	46 %
Agree	35 %	37 %
Neutral	9.7 %	8.7 %
Disagree	5.6 %	3.5 %
Strongly disagree	2.6 %	2.7 %
Involved in making decisions:		
Strongly agree	69.9 %	68.5%
Agree	23.6%	26%
Neutral	4.8%	3.9%
Disagree	0.9%	0.9%
Strongly disagree	0.9%	0.8%
Expectations for labour & birth were met:		
Strongly agree	38 %	38.2 %
Agree	30.7 %	30.2 %
Neutral	17.9%	18.1%
Disagree	10.1%	9.9%
Strongly disagree	3.4%	3.6%
Able to move as much as wanted:		
Strongly agree	39.5%	39.3%
Agree	24.7%	24.5%
Neutral	10.7%	10.7%
Disagree	20.9%	20 %
Strongly disagree	4.2%	5.6 %

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Satisfied with position before pushing:		
Strongly agree	50.3%	49.4%
Agree	39.2%	37.5%
Neutral	7.1%	7.2%
Disagree	2.5%	4.5%
Strongly disagree	1.0%	1.3%
Satisfied with position while pushing:		
Strongly agree	52.2%	49.8%
Agree	39.2%	36.9%
Neutral	7.1%	8.0%
Disagree	2.5%	4.2%
Strongly disagree	1.1%	1.2%

Table No.6 Maternal Satisfaction in both groups.