European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 09, Issue 03, 2022

To Study Upright Position And Dorsal Position During Labor And Their Effect On Maternal And Perinatal Outcome

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Abstract-Women have described birth as an intense powerful life experience that affects their whole life and being, making childbirth the most significant events in their life[1]. Earliest records of maternal birth positions show the parturient in an upright posture, but over centuries delivering women in upright position has become a lost art[2]. Current evidence-based practices for management of the second stage of labor supports the practices of delayed pushing, spontaneous pushing, and maternal choice of positions[3,4].About 19,340 deliveries are conducted in our tertiary care center of mothers with traditional values and receptive to adopting various birthing positions. Thus, this study is conducted at our tertiary care institute to compare the various alternative birthing positions and their effects on maternal and perinatal outcome. Objectives-1.To study duration of labor in upright and dorsal position.2.To study maternal outcome in upright and dorsal position.3.To study fetal outcome with respect to APGAR score and need for neonatal resuscitation.4.To study mothers experience and acceptability by visual analogue scale. Material and Methods-A prospective observational study was conducted after ethical clearance in a tertiary care center among 800 mothers admitted to labor room, who were fitting into inclusion criteria and who gave their consent for participation. The data was maintained, compiled and analyzed. Result- Upright position is associated with significant reduction in the duration of second stage of labor in primipara as well as multipara. The rate of episiotomy, LSCS and instrumental delivery is significantly reduced in mothers opting for upright birthing position. When given a choice, mothers readily adopted the upright position as it had an advantage of "being in control" of the birthing process and is associated with decreased pain perception.

Key words -Upright birthing position, Dorsal birthing position, perineal tears, LSCS.

1. INTRODUCTION

Childbirth is one of the significant events in a woman's life [1] .Practices related to birthing process are important to the wellbeing of the woman. Included among these practices is the horizontal birthing position which has been the subject of a great deal of controversy[5]. Unfortunately, in many countries the hospital admission of labouring women leads obstetrical

practice to restrain spontaneous and instinctive attitude and to focus strictly on intrapartum fetal wellbeing and maternal comorbidities[6]..

Several advantages have been claimed for non-recumbent labor, thanks to "gravity effect" on uterine perfusion, on contractions effectiveness, and on fetal alignment to the pelvic angles and diameters[6]. Positions including knee standing, on all fours, sitting on a birth seat and lateral are where weight is taken off the sacrum allowing expansion of the pelvic outlet. Review showed that using a flexible sacrum position can reduce the duration of the second stage of labor by21.12 min[7] Russell reported that a change from the supine to the sitting position significantly increased interspinous diameter both in the last trimester of pregnancy and 6 weeks after childbirth[8.]

Gupta et al, 2003 and de Jonge et al., 2004 conducted meta-analyses which indicated that the supine position was associated with more instrumental deliveries and reported severe pain compared with other positions [9].Upright positions compared with supine position led a reduction in episiotomies, reduction in caesarean section rate, a smaller increase in second degree perineal tears and fewer abnormal fetal heart rate pattern. The only disadvantage was an increase in blood loss, particularly among women allocated to the birth chair [10, 11]. Resultsfrom the Cochrane review by Aasheim et al suggested that practicing the 'hands off' technique, by adopting upright birthing positions, where the clinician's hands are 'nowhere near the perineum', reduces the use of episiotomy[12]

World Health Organization in 1996 encouraged evidence based practices and stated that 'childbirth is a natural process and in normal birth, there should be a valid reason to interfere with this natural process'[13].Current evidence-based practices for management of the second stage of labor supports the practices of delayed pushing, spontaneous pushing, and maternal choice of positions[14, 15]. Supine birthing positioning is not recommended[14]

Thus the impact of various birthing positions on maternal and perinatal outcome in terms of need for episiotomy, cesarean section rate, perineal tears, NICU admission and pain intensity should be considered.

2. MATERIAL AND METHOD:

A prospective observational study was conducted after ethical clearance in Government tertiary care center from 18th October 2018 to 17th October 2020, among 800 mothers admitted to labor room, who were fitting into inclusion criteria and who gave their consent for participation.

Inclusion criteria-

1. Term (>37 weeks) mothers giving consent for participation in study
2. Only primi and second para with low risk factor will be included in the study
3. No associated medical and surgical illness
4. Pregnant women having no contraindication for vaginal delivery
5. Pregnant women with cephalic presentation

Exclusion criteria-

1. Pregnant women who will not give consent
2. Pregnant women having any medical or obstetric risk factor
3. Pregnant women with previous scar
4. Pregnant women with non cephalic presentation

After applying inclusion and exclusion criteria and after taking written valid informed consent, participants were included in the study.

In ANC care mothers were counselled about different birthing positions at every visit and explained about Duola. When the mother was admitted in labor room, she was recounselled about various positions she can adopt in different stages of labor using pictorial charts and IEC material. They were counselled about how to adopt the position of their choice with the help of Duola.

In 1ststage mother was asked to move around, sit on reclining chairs and take adequate oral fluids. In 2ndstage they were counseled and encouraged to adopt birthing position of their choice -upright or dorsal position with the assistance of Duola. Special birthing beds were provided to mothers to help them adopt birthing position of their choice.

We did not randomize the mothers involved in the study as we practice Respectful Maternal Care(RMC) where the mother's choices and preference were considered and cases were enrolled. A prospective study was conducted in the labor room of tertiary care center.

The birthing position adopted by 800 mothers included in the study were grouped according to Atwood Classification (table 1) into Group 1 and 2. 400 mothers adopting squatting, semisquatting and standing position were allotted in Group 1 while the rest 400 mothers adopting dorsal birthing position were allotted Group 2. Mother's feedback was taken using Visual Analogue Scale (VAS)

Table 1:**Atwood Classification of birthing position**[13]

Supine position	Lateral (Sim's) position. Semi-recumbent(trunk tilted to30º to the horizontal). Lithotomy position. Trendelenburg'sposition(head lower than pelvis).
Upright position(with gravity involved)	Sitting (obstetric chair/stool) Kneeling Squatting unaided or using squatting bars Squatting aided with birth cushion or partner

Data Presentation-

All collected data is presented in a tabulated and graphic form. It is subsequently analyzed for comparing significant difference maternal and neonatal outcome in upright and dorsal position.

Statistical Analysis-

Microsoft word and excel were used to prepare charts and tables. Categorical data is being represented as percentage. Chi square test, t test and Mann-Whitney U test were used to find the significance in various categorical data. (p value less than 0.05 is taken significant). Statistical software, including MS Excel and SPSS version 20, was used for statistical analysis

3. RESULTS-

The Mean age of mothers participating in study is 25±3.26 years. Of 800 participants,552 (69%) are multipara and 248 (31%) are primipara. In the 1st stage of labour, 75.7% of mothers preferred

a combination of ambulatory and reclining position while 19.1% mothers preferred only reclining position.

Table 2 indicates significant association between the birthing position adopted and the parity of the mother. While56.5% of primiparapreferred upright birthing position only 47 % mutipara delivered in upright position.53 % multipara preferred the dorsal birthing position in second stage of labour.

Active management of third stage of labor was carried out in all deliveries and themean duration of third stage of labour is 3.05±1.097 minutes

Table 2- Distribution of mothers according to the parity

	Primipara n (%)	Multipara n (%)	P value
Group 1	140 (56.5)	260 (47)	P=0.017
Group 2	108 (43.5)	292 (53)	
Total	248	552	

Table 3 – Distribution according to duration of 2nd stage of labour

	Group 1 (mean± SD)	Group 2 (mean± SD)	P value
Primipara	37.18±15.16 min	42.19±17.16 min	0.035
Multipara	25.68±16.12 min	30.99±15.27 min	0.004

In Table 3, the mean duration in second stage of labour in primipara in Group 1 is significantly lower than Group 2 (37.18±15.16 minvs 42.19±17.16 min; p=0.035). In multipara, the mean duration in second stage of labour in Group 1 is significantly lower than Group 2 (25.68±16.12 min vs 30.99±15.27 min.; p=0.0004).

Table 4 – Distribution according to the mode of delivery

	Group 1 n (%)	Group 2 n (%)	P value
LSCS	60 (15%)	116 (29%)	0.000
Instrumental delivery	2 (0.5%)	7 (1.7%)	0.046

In Table 4, there is significant decrease in the LSCSand instrumental delivery required in mothers in Group 1 compared to Group 2. The most common indication for LSCS in both groups was fetal distress

Table 5- Distribution according to maternal complications

	Group 1 n (%)	Group 2 n (%)	P value
Need for episiotomy			
Episiotomy given	29 (8.5%)	74 (26%)	0.000
Perineal tear			
Mucosal and 1st degree	48 (14.2%)	43 (15%)	0.35
II degree	11 (3.2%)	15 (5.5%)	0.10
III degree	3 (0.9%)	5 (2%)	0.06
IV degree		2 (0.5%)	
Need for cervicovaginal exploration			
Cervicovaginal exploration done	3 (0.9%)	7 (2.5%)	0.06
Total	340	284	

In Table 5, after excluding the mothers requiring LSCS, the episiotomy given during Full Term Normal Delivery and instrumental delivery was significantly less in Group 1 than Group 2
No significant difference is found in the mucosal and 1st degree tear, second degree tear, third and fourth degree perineal tear as well as need for cervicovaginal exploration in the two groups

Table 6- Distribution according to fetal outcome

	Group 1	Group 2	P value
1 minute APGAR score- (mean±SD)			
APGAR score	8.12±0.99	8.02±1.07	0.07
NICU admission needed - n (%)			
NICU admission	20(5%)	36(9%)	0.06
Total	400	400	
Birth weight – (mean±SD)			
Mean birth weight	2.88±1.41 kg	2.82±0.26 kg	0.476

In Table 6, no significant difference was seen in fetal outcome with respect to 1 minute APGAR score and NICU admission in the two groups. No significant difference was seen in mean birth weight in two groups. Of all babies requiring NICU admission, meconium aspiration is the cause in 60.7%

Table 7- Distribution according to mothers experience with various birthing positions

	Group 1	Group 2	P value
Severity of pain by Visual Analogue Scale			
VAS score mean±SD	3.37±1.87	6.5±2.08	0.000
Pain intensity scores n (%)			
Very bearable pain	83(20.75%)	52 (13%)	<0.000
Bearable pain	278 (69.5%)	156 (39.1%)	
Barely unbearable pain	39 (9.75%)	192 (47.9%)	
Total	400	400	

In Table 7, severity of pain with respect to Visual Analogue scale in 2nd stage of labor shows significantly lower mean VAS scores in Group 1 as compared to Group 2. Severity of pain as assessed by the Pain intensity scores showed significantly lesser mothers experiencing barely unbearable pain in Group 1 as compared to Group 2.

When interviewed, 94.25% women in Group 1 reported having a positive experience willingness to adopt the same in subsequent pregnancies.

4. Discussion-

The upright birthing position empowers the mother to take control of her own birthing process[15]. Squatting position is regarded as the most natural position and is very similar to the habitual resting position. The only trouble is that it is difficult to maintain squatting for a long time though the advent of birthing bars and birthing stool have made it easier.

Fig 1- Birthing bed used in the study to provide birthing position of choice

The present study aims at finding the impact of upright and dorsal birthing position on maternal and neonatal outcome.

The limitation of this study is that the upright position though having many benefits over dorsal position is difficult to maintain by the birthing mother causing frequent shifts between the upright and dorsal positions during labor. It is difficult to distinguish between position during second stage of labor and position at the time of birth. The confounding factor in our study could be providing mothers with Doula and RMC.

In the present study, there was reduction in the mean duration of 2nd stage of labor in Group 1 in primipara by 5.01 minutes and in multipara by 5.31 minutes. This decrease in duration of labor was statistically significant. Studies conducted on primigravida by Azhari et al and Phomdoung et al; study conducted by Moraloglu et al comparing squatting and supine position; and RCT conducted bySimaro et al also showed consistent findings[7,16,17]. The upright position reduces the second stage of labor by increasing maternal feeling of control, increasing mobility, increasing the diameter of pelvic outlet and gravity working synergistically with uterine contractions.[16]

Cochrane systematic review 2017 found no clear difference in rate of caesarean section between upright and dorsal position (p=0.49)[17]. A study conducted by Dani et al compared squatting and dorsal recumbent position and reported similar findings (p=0.374)[18]. This was inconsistent in the present study wherein, significant decrease in rate of LSCS is seen in Group 1 as compared to Group 2 as other than upright position to decrease LSCS rate, we practiced various non clinical interventions including providing birth companion, providing Respectful Maternity Care to all mothers, encouraging adequate mobility in first stage of labor and encouraging the mother to relax and rest. LSCS audit by Robson's classification was also done. Only patients with cephalic presentation were included in the present study and high risk cases were excluded from the study. All the above reasons caused significant difference in the LSCS rate in the two Groups.

The present study shows significant decrease in need for instrumental delivery in Group 1 which is consistent with studies conducted by Dani et al and Cochrane review 2017[17,19].

The present study Group 1 shows significantly decreased episiotomy rate. This finding is consistent with the Cochrane systematic review 2017 and study conducted by Ank deJonge[17,19].Results from this analysis should be interpreted with caution asepisiotomy is influenced by various factors including individual practice, the type of upright position adopted and instrumental birth[17] .Our policy for episiotomy in the present study is to individualize the need for episiotomy in every mother and we exercise selective and restrictive use of episiotomy.

In the present study, we can see that, although no perineal support can be given in upright position, like in dorsal position, there is no significant reduction in the rate of in second degree perineal tears in Group 2 vs Group 1, which is consistent with the Cochrane review and studies conducted by Ank De Jonge, and, Moralgolu et al[16, 17, 19].

In the present study, no significant difference in third and fourth degree perineal tear is seen in two groups which is consistent with the Cochrane review 2017(p=0.44)[17].

In the present study the mean birth weight in Group 1 is 2.88±1.41 kg and Group 2 is 2.82±0.26 kg which is not statistically significant consistent with study conducted by Moralgolu et al[16].

The present study showed no significant difference in Apgar score and NICU admission of babies delivered in two groups which is consistent with Cochrane review 2017, studies conducted by DeJonge 2014 and Moragulu et al[16,17,19].

The present indicates a significant difference in the mean VAS between two groups indicating decrease pain intensity in the upright position, which are consistent with the studies conducted by Valini M et al, Nilsen et al, Moralgolu et al and Gizzo et al[6, 16, 20,21].

In the present study Group 1 is associated with significantly less pain intensity which correlates with study conducted by De Jonge et al, Phumdoung et al and Azhari et al wherein women reported significantly reduced sensation of pain in second stage of labor in upright position as compared to dorsal position sitting position[17, 19].

5. CONCLUSIONS

All mothers along with the birth companion of her choice, should be counselled from ANC period itself about the different birthing positions, advantages of the same and the various ways to adopt the same. As there is no one correct delivery position, but a range of alternatives that the mother can adopt, obstetrics should motivate and encourage the mother to take the position of her choice.

Upright position is associated with significant reduction in the duration of second stage of labour in primipara as well as multipara. The rate of episiotomy, Lower segment caesarean section and instrumental delivery is significantly reduced in mothers opting for upright birthing position.

When given a choice, mothers readily adopted the upright position as it had an advantage of "being in control" of the birthing process and is associated with decreased pain perception. Upright birthing position should be offered to women in second stage of labour, especially in situations where expedited delivery may be indicated.

Respectful Maternity care is the right of every birthing woman and empowering mother to adopt the position of her choice is a small but effective step towards Respectful Maternity Care.

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