MATERNAL BIRTHING POSITION AND OUTCOME OF LABOR

GANAPATHY THILAGAVATHY

INTRODUCTION

Throughout the ages and across human cultures women have preferred to give birth with their bodies vertical in sitting or squatting positions by grasping a tree, ropes or knotted piece of cloth and they generally avoided lying flat on their back positions. In today’s standards laboring women are confined to “stranded beetle” supine-lithotomy position, for the convenience of the health personnel, whereas it is not ideal for the birthing mother to push the baby uphill against the gravity. Lithotomy position is not based on evidence and it comes with multitude of poor factors. This position is illogical making the birth needlessly complicated, expensive, turning natural process into medical event and the laboring women to become simply the body on the delivery table to be relieved of their contents. No other species adopt this disadvantageous position at such a crucial and critical time. Our upright position makes us unique amongst mammals and, however this evolutionary development has made giving birth much more difficult and those difficulties can be made much more worse when we do not even take the advantages of the help that gravity can provide. History, worldwide prevalence, recent research, and number of trials, suggest that upright posture during labor is associated with shorter duration of labor, reduced reporting of labor pain, fewer instrumental deliveries, operative births, fewer abnormal fetal heart rate patterns and less postpartum depression.

In certain parts of the world women who deliver at home with the help of birth attendants use upright birthing positions of their choice in contrast to lying flat on the back position routinely followed in the hospitals. It is conceivable that lack

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of birthing positions at hospitals/health centers could be the contributing factor to women choosing to give birth at home with unskilled birth attendants who encourage them to use comfortable upright position according to their body signals. A simple elevation of the back of the laboring women with the easily available resources of backrest, pillows could be beneficial to maximize the important benefits of gravity as it is easier for an object to fall towards the earth’s surface, than to slide parallel to it (Newton’s Law of Gravity) to augment the labor process.

WHO has recommended the use of upright position for labor and childbirth - Category A - a practice clearly useful and effective and the supine-lithotomy as Category B - a practice very clearly harmful, ineffective and to be eliminated from the practice. Therefore, an identification of an optimal position is highly relevant to all women and it should be a part of every skilled birth attendants repertoire.

**METHODODOLOGY**

A randomized experimental study was carried out in the labor room of the Municipal Maternity Corporation Hospital, Yediur, Bangalore, Karnataka, from April 2008-September 2009. A total of 200 normal low risk primigravidae between 38 - 42 weeks of gestation with single vertex fetus in anterior position, adequate pelvis, presenting in active labor were selected. Primigravidae with any medical or obstetrical risk factors were excluded.

After a detailed discussion with the participants about both the positions, an informed consent was obtained. The women were randomly assigned to experimental group- the upright supported sitting - n=100, and control group- routine supine-lithotomy position n=100 by coin toss method. Both the groups were mobile during the first stage of labor.

In the experimental group, the woman’s back was elevated to 60° angle to assume upright supported sitting position by a simple backrest attached adjustable delivery cot. The control group assumed the routine lying flat on the back-supine-lithotomy position. Intensive monitoring of their progress, and constant physical, emotional support was given by the Researcher.

Once birth was imminent, right mediolateral episiotomy was given and delivery was conducted in their allotted position. The third stage of labor was also conducted in the same position and after the placental delivery, the backrest was lowered to horizontal position and the women were placed in the supine position for repair of episiotomy. The main outcome variables measured were the duration of second, third stages of labor and amount of blood loss. Data were analyzed by SPSS Version - 15 and descriptive, inferential statistics were computed for presentation.

**RESULTS**

The two groups were homogenous with regard to all demographic and obstetrical variables as analyzed by Chi-square and Fishers exact test. Student “t” test was used to compare the mean differences between the two groups on the duration of second, third stages of labor, the amount of blood loss, the intensity of labor pain, quality of Fetal Heart Rate patterns, quality of maternal blood pressure and the Apgar scores of the newborn at 1 and 5 minutes of birth.

Reduced reporting of severe pain among 16 (16%) of the participants in the supported sitting group during the second stage of labor as compared to the highest number of the participants 58 (58%) in the lithotomy position group who reported the pain as very severe on the Visual Analogue Pain Scale -100mm. The mean intensity of labor pain scores were 80 mm among the participants in the supported sitting group versus 92mm in the lithotomy position.
group, with the significant mean difference of 12mm lower pain scores in VAS, among participants in the supported sitting group, “t”= 10.390, p<0.001 than those in the lithotomy position.

All the participants in the supported sitting group 100 (100%) had maintained normal baseline blood pressure throughout, while as 17 (17%) of the participants in the supine- lithotomy position had a drop in their baseline blood pressure, as the mothers were lying flat on their back in supine position resulting in supine hypotension.

Irregular fetal heart rate patterns were observed among 7 (7%) of the primigravidae in the 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. The duration of the second stage of labor was significantly shorter in the supported sitting group with 56 minutes as compared to 67minutes, in the supine- lithotomy position with the mean difference of 11 minutes, “t”= 14.403, p<0.001 (Table-1). Similar statistically significant differences were noted in the duration of third stage of labor among the women who delivered in the supported sitting position with 12 minutes as compared to 22 minutes in the supine-lithotomy position with the mean difference of 10 minutes, “t”= 23.872, p<0.001 (Table-1).

| TABLE 1 |
| Comparison of Supported sitting and Supine - lithotomy position on the Duration of Second & Third stages of labor |
| Duration of labor in minutes | Experimental group mean (SE) | Control group mean (SE) | “t” Value | P |
| Second stage | 56 (0.57) | 67(0.49) | 14.403** | p<0.001** |
| Third stage | 12 (0.3) | 22(0.23) | 23.872** | p<0.001** |

“t” ( 198; 3.390; 0.001) = 14.403**: 23.872**: p<0.001: ** Significant at 0.001 level.

There was no significant difference in the average amount of blood loss between the two groups and none of the participants in both the groups had a blood loss more than 500ml. There was no occurrence of retained placenta and postpartum hemorrhage among the participants in both the groups (Table-2).

| TABLE 2 |
| Comparison of Supported sitting and Supine-lithotomy position on the Amount of Blood Loss |
| Experimental group mean blood loss in ml (SE) | Control group mean blood loss in ml (SE) | “t” Value | P |
| (N=100) | (N=100) |
| 340 ml (4.31) | 330ml (4.27) | 1.649** | p>0.001** |

“t” ( 198; 3.390; 0.001) 1.649**: p>0.001: ** Non Significant at 0.001 level.

Instrumental deliveries by forceps or vaccum were fewer among the participants in the supported sitting group 8 (8%) as compared to 42 (42%) in the lithotomy position. There was no incidence of lower segment cesarean sections-operative delivery among both the groups. All the participants were given right medio lateral episiotomy and there was no significant occurrence of perineal lacerations, Para urethral, cervical or anal sphincter tears.
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 with the “t”= 3.4, p<0.001 at 1 minute and “t”= 3.2, p<0.01 at 5 minutes than those in the lithotomy position.

The participants (98%) in the supported sitting postures were very cooperative and were able to maintain the position without any difficulty.

**Discussion**

The participants maintained the supported sitting position so comfortably throughout the second and third stages of labor without any adverse effect on maternal and neonatal outcome. Maternal and fetal parameters were constantly monitored in both the groups without any difficulty, inconvenience and discomfort to the mothers. This finding was consistent with the findings of a descriptive study conducted by Mayberry et al\(^2\) who evaluated the use of upright position during the second stage of labor among 74 low risk term primigravidae who had received low dose epidural analgesia during the first and second stages of labor. Results showed that all women were able to maintain upright position throughout second stage of labor following epidural analgesic administration with no adverse neonatal and maternal outcomes such as excessive vaginal bleeding.

There was a significant reduction in the labor pain scores by 12 mm in VAS in the supported sitting posture as compared to conventional lithotomy group which was consistent with the study findings of Adachi et al\(^3\) who evaluated the effect of upright versus supine lithotomy position on the intensity of pain scores among 58 low risk term women on 100 mm VAS that women who assumed upright postures during labor reported significantly lower pain scores of 13 mm in VAS than those who assumed supine/lithotomy position.

A fewer irregular fetal heart rate patterns were observed among seven (7%) of the primigravidae the in the supported sitting group as compared to 13 (13%) of the primigravidae in the supine-lithotomy group. Similar findings were reported by a case control study by Cito et al\(^4\) who evaluated the effects of upright versus supine/lithotomy posture on the fetal heart rate patterns during the nonstress test among 368 low risk term primigravidae. The results showed that the reclining supine position was associated with greatest number of variable decelerations than the upright postures.

All the participants in the supported sitting group 100 (100%) had maintained normal baseline blood pressure throughout, while as 17 (17%) of the participants in the supine-lithotomy position had a drop in their baseline blood pressure, because the mothers were lying flat on their back in supine position and the pressure of gravid uterus compressing major abdominal blood vessels resulting in supine hypotension—aortocaval occlusion as contrary to the supported sitting position which keeps the gravid uterus off the major blood vessels with simple elevation of their back preventing supine hypotension and aortocaval occlusion. The results of this study is in line with the comparative study by Ariel et al\(^5\) who evaluated the effects of supine versus non-supine on the maternal blood pressure by the ultrasound estimation of blood flow in the right ascending branch of the uterine artery among normal primigravidae reporting that the maternal blood volume decreased from 410+/93 to 267+/ 73cc minute in supine position.

There was a significant decrease of 11 minutes in the duration of second stage of labor among women in supported sitting posture as compared to supine-lithotomy group which was similar to the findings of Cochrane Pregnancy Childbirth Group systematic review of randomized trials.
conducted by Gupta et al⁶ who evaluated the benefits and risks of use of any upright (sitting, squatting) versus supine-lithotomy position during the second stage of labor among 5164 pregnant women. The result of the trials revealed that the use of any upright (sitting, squatting) versus supine-lithotomy position during the second stage of labor is associated with reduced duration of second stage of labor (10 trials-mean 4.29 mts, 95% CI 2.95- 5.64 mts).

The placental delivery time was also significantly reduced in the supported sitting position by 10 minutes than the supine-lithotomy position. Similar findings were reported by Bomfim Hyppolito et al⁷ who conducted a randomized clinical trial among 248 low risk term primigravidae, with 127 in sitting and 121 in supine position during the second stage of labor to evaluate the possible advantages and disadvantages of sitting versus supine position. The results of the trials reported that the sitting position resulted in decrease of 3.4 minutes in the duration of the delivery of the placenta than the supine position.

The estimated average amount of blood loss was 340ml 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 500ml. Though the blood loss was 10 ml more in the supported sitting group, the difference did not reach significance. This study finding is similar to the case control study conducted by Bodner-Adler et al⁸ who evaluated the outcomes of an upright versus supine position during the second stage of labor 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. These findings suggest that the upright supported sitting position during child birth is a safe alternative maternal position.

The rate of instrumental deliveries by forceps or vacuum were fewer among the participants in the supported sitting group 8 (8%) as compared to 42 (42%) in the lithotomy position group and none of the participants in both the groups underwent lower segment cesarean sections- the operative delivery. Right medio lateral episiotomy were given to all the participants in both the groups and there was no significant occurrence of perineal lacerations, para urethral, cervical or anal sphincter tears among both the groups. The results were similar to the study by Dejonge et al⁹ who assessed the effects of upright versus supine position during delivery among low risk term parturient in a randomized control trial. The results of the trial showed that women in the upright group had experienced less pain, perineal injury and instrumental delivery than those in the supine position.

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 Terry et al¹⁰ who compared the neonatal outcome in upright versus supine/lithotomy among 198 low risk term primigravidae. The results showed that the Apgar scores at 1 and 5 minutes were significantly higher among the newborns born to the women in the upright postures (8.4 versus 8.1) at 1 minute (9.2 Vs 8.9) at 5 minutes than the newborns born to the women in the lithotomy position.

**CONCLUSION**

A simple elevation of the back of the laboring 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 labor, 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. Skilled birth attendants have an important responsibility to promote comfort during labor and birth and should strive to bring a paradigm shift from the routine supine/lithotomy position that works against gravity to women centered, 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 labor.

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REFERENCES


