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Research Paper

Effecttivenness of Birthball Usage During Labour on Pain and Child Birth Experience Among Primi Parturient Mothers : A Randomized Interventional Study

Medical Science

KEYWORDS : Birthball, labour , Child birth experience and parturient mothers

Mrs. M. vaijayanthimala — M.Sc (N), PhdScholr, SRM University, Kattankulathur, Kancheepuram District – 603203, Tamil Nadu, India.

Dr. A. Judie — Dean, SRM College of Nursing, SRM University, Kattankulathur, Kancheepuram District – 603203, Tamil Nadu, India.

ABSTRACT

Aim: To evaluate the effectiveness of birthball usage during labour on pain and child birth experience of primi parturient mothers. In addition , it also tested the effect of bithball usage on labour outcome.

Participants and setting: The study was conducted in Government general hospital, Thambaram in Chennai, Tamilnadu with 3000-3500 annual births. 240 low risk primi parturient mothers were recruited and were allocated bySimple random sampling technique into the two arms of the study,but only 106 in study and 105 in control group participants completed the trial.

Intervention: The study group underwentbirthball exercise programme consisted of 15 minutes videotape followed by live demonstration on birthball positioning and movements during prenatal checkups. Members of study group were asked to practice the swaying movements and positions on birthball at least 20 minutes after the 36 weeks of gestation. Each women in study group was given birth ball during labour and encouraged every hour to practice movements withbithball. Both the groups were received standard nursing care in all aspects of childbirth.

Measurement and findings: In active stage of labour (3-6 cm of cervical dilatation) the women completed the demographic and obstetrical information and pain was measured by 0- 10 numerical rating scale and child birth experience was measured by modified labouragentry scale. This study revealed that there was high significant difference found in pain and child birth experience at p=0.001 level between study and control group. Mothers in study group had shorter duration of first stage , less need for augmentation and pain medication and fewer caesarian delivery than control group.

Conclusion: The study concluded that, clinical implementation of birthball usage during labour could be an effective non pharmacological intervention in reducing pain perception and andimprove the child birth experience.

INTRODUCTION

Child birth is an unique boon given to women folk and every women experiences immeasurable bliss and bless while carries a baby in her womb. Child birth while primarily a joyful event , also exposes the mother one of the severest form of pain reported[1,2]. The perception of labour pain varies from women to women and influenced by fear and anxiety levels, experience with prior childbirth, cultural ideas of childbirth and pain and pain is one of the important factor determines the women's experience with child birth3,4.

The choice of movements and position changes play a key role in determining the perception of labour pain during birth and enhancing positive birth experience by achieving good maternal and fetal outcome. In fact, women who use movements in labour report that it is effective method of relieving pain and restricting women's movements during labour may result in worst birth outcome and decreases women's satisfaction with their birth experiences5.

Naturally, during confinement and laboring period women always wants to move, and change positions spontaneously to make themselves more comfortable by walking, swaying, lunging, kneeling, and rocking and sometimes it is advised to them by the care givers also. To attain this they are recommended to use any form of comfort devices such as birth ball, rocking chair, backrest and extra pillows. Some observational studies also show that is still true in settings where the environment is favourable6**.** These specific positions and movements that are thought to accelerate the labour process, or correct the maternal or fetal problem. A pilot study was recently conducted at two Canadian hospitals suggested that women assigned to ambient room which had additional equipment for mobility such as birth balls and calm atmosphere had positive birth experience and they spend 50%or less time in laboring and reduced need for oxytocic infusion7. When mothers are move around in labour uterus muscle, works more effectively8 Changing position frequently moves the bones of the pelvis to help the baby to best fit , while upright positions use gravity to help the baby decend to the birth canal and increases the diameter of the pelvic inlet and outlet9. These advantages are achieved through using the versatile tool called "Birth ball" during the labour for adopting various movements and positions.

Birth ball has been introduced to the obstetric setting to facilitate the mobilization of the laboring women and nowadays birth ball has become more popular in many hospitals and birth centers. Swaying movements increase more benefits to the mothers.The sitting position assumed on the ball, similar to a squat, opens the pelvis, helping to speed up labour and gently moving on the ball greatly reduces the pain of contractions 10 With the ball on the floor or bed, the mother can kneel and lean over the ball, encouraging pelvic motion which can aid a posterior baby in turning to the correct position, thus allowing labour to progress more quickly. This position is wonderful for a mother who is having back labour caused by a posterior position11.

Cochrane evidenced based review found that women who labored out of bed during active stage of labour were 17% less likely to seek pain relief, shortened labour and have 90% chance of turing their babies from posterior position if they remain upright and moves during much of their labour.

Most of the women are giving birth in health-care facilities, usually in lying down position on the bed. Unfortunately, the use of these horizontal birth positions is rooted in convenience for doctors, not based on research evidence. Nowadays confinement is practiced by risk-focused management. In clinical settings today, it is unusual for a woman not to be connected to a fetal monitors and intravenous (IV) , because risk factors identified during the intra partum period make many women potential candidates for Caesarean section and these various measures can serve to limit mobilization during labour to a great extent. National survey of child bearing experiences in united states depicts that 71% of women said not walk around and most reason they gave was they were 'connected to things' (67 %), due to pain medication(32%) and told not to walk (28%)12.

Although various position and movements adopted during labour, controversy still exit to choose the best. Additionally, in developed countries many hospitals today provide amenities like birth ball, rocking chair, beanbags, tubs or showers, in birth suite in order to make women stay out of bed and enhance the sense satisfaction. But in developing countries like India these options are lacking in birth centers .

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This issues on movements and position changes using birth ball depicts that need for an hour to be discussed and analyzed to make the birth "as nature intended".So the present aim of this study is "To evaluate the effectiveness ofbirthball usage during labour on pain and child birth experience among parturient mothers".

MATERIALS AND METHODS

This was a randomized interventional study. The study was conducted in Government general hospital, Thambaram in Chennai, Tamilnadu, India with 3000-3500 annual births. 240 low risk primi parturient mothers were recruited and were allocated by Simple random sampling technique into the two arms of the study. Out of 240 menopausal women, 120 of them were allotted to study group and 120 of them to control group,but only 106 in study and 105 in control group participants completed the trial. The inclusion criteria for sample selection includes primi parturient mothers at gestational age 37 to 40 weeks with initial cervical dilation >/ 3cm with single fetes with cephalic presentation and who had normal vitality. parturient mothers who were receiving analgesics, induced by medical or surgical method, had rupture of membrane, had history of pregnancy and labour complications,those who have medical complications like Diabetes mellitus, Asthma and Hypertension are excluded from the study.Formal approval was obtained from the Institutional review board and from the civil surgeon of the government hospital Thambaram to conduct the present study. Both written and verbal information about the study were given in local language to women who participated in the present study.

The questionnaire for present research study comprises of three sections. Section I:Demographic Information was collected through personal interview using a structured questionnaire-Section II :Pain was assessed by using a 0-10 numerical rating scale in which 0 represented absence of pain and 10 unbearable pain scoring was done based on mild pain(1-3), moderate pain (4-6) severe pain(7-10). Section III:Child birth experience was assessed byChild birth experience was assessed by using the Modified LabourAgentry (LAS) scale which was basically invented by Hodnett. ED, Simmons-Tropea.DA13.This is the 7 point rating scale which has 10 item inventory including 6 positive and 4 negative items related to perceived degree of control and this scale was modified in to 6 point rating scale with 5 positive and five negative items equally. The 5 positive descriptions are i felt confident, control, relaxed, important and secure and 5 negative descriptions are I felt fearful, uncontrollable,tensed, helpless and insecure. All these items are perceived degree of control during child birth . Women ranked the items on a 6 point rating scale from (0) "almost all the time to (5) "never or almost never". The positive items were reversed for the analysis and high score equal to high control. If the women always experienced positive experience listed during child birth and never experienced negative feeling then she would score 50 on LAS. Total items are 10 and total score is 50. Reliability was assessed through Pre testing of the tool to check the clarity of the items, feasibility and objectivity of the tool by administering it to 75 mothers. Validity obtained from 12 experts. The alpha coefficient reliability value was r = 0.85. Formal permission was obtained from the concerned author for modification of this tool and it was permitted to proceed.

INTERVENTION

The study group underwent birthball exercise programme consisted of 10 minutes videotape followed by live demonstration on sitting , swaying on birth ball from front to back or side to side movementsand hands and knees positioning during prenatal checks. Members of study group were asked to practice the swaying movements and positions on birthball at least 20 minutes during their prenatal checkups after the 36 weeks of gestation.

Each women in study group was given birth ball during labour and practiced following positions and movements using birth ball.

i. Sitting on a birth ball: According to the height of the mother the investigator selects the ball size and placed on the floor near to the bedside and make the mother to sit on the ball by holding the lateral edge of the bed and the support is given by standing back side of the mother and holding her shoulder and asks mother sit on a birth ballfor 5-10 minutes
ii. Swaying movements: swaying on birth ball from front to back or side to side movements for 5-10 minutes
iii. Leaning over the ball: Leaning on the birthball and getting in to hands and knees position by hugging the birthball from kneeling position for 5-10 minutes.

Mothers were encouraged every hour to practice sitting, swaying and leaning over the bithballup to 7 cm of cervical dilatation. Both the groups were received routine hospital care related to child birth.

RESULTS

Out of 240 participants, there were totally 29 dropouts, 14 in the study group and 15 in the control group due to fetal distress, intolerable pain needed pain medication, needed augmentation and uncooperative mothers. The analysis was done for a total of 211 participants (106 in study group and 105 in control group)

The baseline values were not significantly different between study and control groups for all the demographic variables including age (p=1.00), religion (p=0.87), Education(p=0.49), Occupation (p=0.57), Type of work (p=1.00), Residence (p=0.38), support system (p=0.37) , Type of family (p=0.43), information on birth ball usage (p=0.34), Source of information (p=0.18), Body mass index(p=0.84) and gestational age(p=0.58)

Table 1: comparison of Post interventional pain level between study and control group N=211

Level of pain		Group				Chi square test
		Study		Control		
		N	%	N	%	
	Severe	0	0.0%	13	12.4	
	Moderate	60	56.6%	86	81.9	$\chi 2$=18.83 P=0.001***
	Mild	43	40.6%	26	24.8	

From the above table 1, in study group none of the mother experienced severe pain after the usage of bith ball where as in control group 12.45% of mothers had severe pain.56.6% and 81.9% of women had moderate pain in study and control group respectively.40.6% of study group women experiences mild pain where but 24.8% of control group mothers had mild pain which depicts the effect of movements and position changes on pain.. There is high statistical deference (p=0.001) found in post interventional level of pain between study and control group.

Table 2: comparison of mean and standard deviation of birth experience score between study and control group N=211

	Birth experience		Student's Independent t-test
	Mean	SD	
Study group	32.85	3.29	t=12.62P=0.001*** DF=209
Control group	27.40	2.97	

Table 2 depicts that in study group, birth experience mean score was 32.85(SD=3.29) whereas in control group it was only 27.40(SD=2.97) and the difference was 5.45 score and this is due to movements and position changes using birth ball during labour.There was high statistical significance at p=0.001 level found in child birth experience between study and control group.

Table 3 :Comparison of labour outcome between study and control group of primi parturient mothers N=211

Labour outcome		Group				Chi square test
	Study group (106)		Control group (105)			
	n	%	N	%		
Type of delivery	Caesarean section	14	13.3	21	21.20	$\chi 2 = 3..601$ P = 0.01** DF=2
	Forceps/ vaccum	3	2.9	6	5.71	
	Normal vaginal delivery	93	87.7	78	74.2	
Duration of labour	>14 hours	32	30.2	52	49.5	$\chi 2 = 16.95$ P=0.001*** DF=2
	12-14 hours	21	19.8	29	27.6	
	< 12 hours	53	50.0	24	22.9	
Contraction pattern	Less effective	27	25.5	44	41.9	$\chi 2 = 11.42$ P = 0.01** DF=2
	Moderate effective	14	13.2	21	20.0	
	Effective	65	61.3	40	38.1	
Use of analgesic	Need after 7 cm dilatation	28	26.4	37	35.2	$\chi 2 = 17.02$ P=0.001*** DF=2
	Need during second stage	10	9.4	28	26.7	
	Nil	68	64.2	40	38.1	
AUA Augmentation with oxytocin	Need after 7 cm dilatation	32	30.2	48	45.7	$\chi 2 = 14.51$ P=0.001*** DF=2
	Need during second stage	22	20.8	32	30.5	
	Nil	52	49.1	25	23.8	

From the table 3 it was observed that between the study and control group there was very high statistical significant difference found in labour outcome such as, duration of labour, use of analgesics, and augmentation with oxytocin at p=0.001 level. Type of delivery and contraction pattern were highly significant at p=0.01 level.

DISCUSSION

1. Pain in labour is a universal experience for child bearing women. A recent descriptive review by lowe stated that nulliparous women generally experience more sensory pain during early labour[14,15]A woman's sense of satisfaction with her childbearing experience changes over time; A systematic review of the literature by Hodnett16 on the relationship between the use of labor analgesia and maternal satisfaction concluded that pain relief does not play a major role in overall maternal satisfaction with the childbirth experience. Three randomized controlled trials (RCTs) included in the review did not demonstrate improved satisfaction with increased pain relief. The review also found that women preferred a home-like birth environment.Another study examined the influence of epidural analgesia in parturients electing child birth and found that pain relief alone was not found to improve maternal satisfaction and this study highlights the importance of experience and prelabourexpectation on maternal satisfaction with childbirth17.This present study result reveal thatmothers in study group those who engaged with various movements and position changes using the birth ball experienced less pain compare with control group. The supportive study related to this findings has shown that the ability to move and change position during labour experienced less pain and more comfortable and required less painmedication18.

2. With regards to child birth experience there was high statistical significance found in child birth experience between study and control group at 0.001 level and the difference mean value was 5.45 score between these groups which shows that usage of birthball during labour enhances positive child birth experience among the parturient mothers. This result was supported by a qualitative study on 'characteristics of a positive experience for women who have unmedicated childbirth' found thatSeventeen women were interviewed and themes were identified. Being able to move and change positions freely were both key factors in determining a positive birth experience19.

3. With regards to effect of birth ball usage on labour outcome shows that study group mothers had lower rate of caesarean and instrumental delivery and effective contraction and decreased duration of labour and reduced the need of analgesics and augmentation of labour than the control group and there was a high significant difference found at p=0.01 and p=0.001 level. These results are supported by a study on influence of maternal mobility on duration of active phase of labour which was done by Bio.Eliane, Bitter.Roberto Eduardo20 shows that the good performance of maternal mobility has positive influences on labour process; it increases tolerance to pain, avoids the use of analgesics drugs during labour, and improves the evolution of dilatation and reduces the duration of the active phase

CONCLUSION

Thus, the present study has shown that, practice of movements and position changes using birthball during labour decreased the perception of labour pain , enhances the positive child birth experience and improve the favorable labour outcome among the parturient mothers. Hence the usage of birthball is an effective, simple and cost effective non pharmacological intervention and it could be used as a effective intra partum periodmanagement.

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