



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2021; 7(6): 165-169
www.allresearchjournal.com
Received: 19-04-2021
Accepted: 21-05-2021

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A quasi experimental study to assess the effectiveness of ambulation versus birthing ball on the fetomaternal outcome during first stage of labour among primigravida mothers admitted in maternity ward of GGSMCH, Faridkot, Punjab

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DOI: <https://doi.org/10.22271/allresearch.2021.v7.i6c.8651>

Abstract

Aim: To assess the effectiveness of ambulation versus birthing ball on the fetomaternal outcome during first stage of labour among primigravida mothers admitted in maternity ward of GGSMCH, Faridkot, Punjab. The study was conducted in maternity ward of GGSMCH, Faridkot, Punjab. Quasi experimental research design was used. The study comprised 60 primigravida mothers, with first stage of labour. 30 in Group 1 (Control group) and 30 in Group 2 (Experimental group) who fulfilled the inclusion criteria by using Convenience Sampling Technique. WHO modified partograph was used to assess the effectiveness of ambulation and birthing ball on the fetomaternal outcome. After pre test, subjects in group 1 were encouraged to walk for 15 minutes per hour with a period of 45 minutes rest and continue this for 4 times and subjects in group 2 were encouraged to sit with legs bend at 90 degree and remain in the upright position for 15 minutes per hour with a period of 45 minutes rest and continue this for 4 times and post test was done. Data analysis was done by using descriptive and inferential statistics.

Results: The results revealed that birthing ball was effective in improving fetomaternal outcome concerning Intensity of uterine contraction (χ^2 value 10.947 and p value 0.004) and duration of first stage of labour (χ^2 value 9.785 and p value 0.020) as statistically significant difference at $p < 0.05$ has been found between two groups.

Conclusion: The study concluded that birthing ball was effective in improving fetomaternal outcome among primigravida mothers when compared with ambulation.

Keywords: fetomaternal outcome, primigravida mothers, birthing ball, ambulation, first stage of labour, WHO modified partograph

Introduction

Labour process may be viewed as a test of womanhood, a test of personal competence, a peak of experience, and the first act of motherhood. Labour process starts with the onset of regular uterine activity associated with effacement and dilatation of the cervix and descent of the presenting part through the cervix ^[1].

Ambulation or upright positions during labour have a number of physiological benefits, including the effect of gravity and increased pelvic dimensions, which may help your baby to come down and decreases the need for instrumental deliveries. Restricting women's movement may result in worse birth outcomes and may decrease women's satisfaction with their birth experiences. Activity provides distraction from discomfort, a sense of greater personal freedom, and a chance to release the muscle tension that can increase pain. In fact, women who use movement in labor report that it is an effective method of relieving pain ^[2]. Birthing ball helps the mother to be in an upright position and also it opens (widens) pelvis, encouraging baby to move down. Changing positions during labour can change the shape and size of the pelvis which can help the baby's head move to the optimal position during first stage labour, and helps the baby with rotation and descent during the second stage ^[1].

Need of the study

Child birth is an exciting and meaningful experience in women's life. Child birth as a deep significance not only to the mother and her partner but also to the whole family. It is a profound physiological, psychosocial and spiritual event. This is the joy and expectation from the entire family that drive the mother to face all the suffering associated with this [3].

Normal labor progress is greatly linked with properly compatible management. While the improper management may result in dystocia, prolonged and/or obstructed labor, which may result in maternal exhaustion, postpartum hemorrhage and puerperal sepsis [4].

Many studies have shown the effectiveness of maternal positions on the frequency and intensity of uterine contractions during labour. Lateral positions were associated with more effective uterine contractions (i.e; stronger intensity and lower frequency) than the supine position; this effect was more marked in spontaneous labor compared with oxytocin-induced labor. The influence of position change on maternal hemodynamic changes also has been studied. There is evidence that lateral position are associated with a higher cardiac output, decreased heart rate and increased stroke volume compared with the supine position [5].

So, the emphasis should be made on the practice of alternative and contemporary modalities such as, continuous labor support, hydrotherapy, different positions (upright position, left lateral position), ambulation, birthing ball, aromatherapy etc to prevent discomfort and complications (obstructed labour, dystocia) associated with labour. These modalities can enhance progress or effectiveness of pushing

and can promote sense of accomplishment and capability which can be more critical to a satisfying childbirth experience than pain relief unlike pain medication [6].

Materials and Methods

In order to assess the effectiveness of ambulation versus birthing ball on the fetomaternal outcome during first stage of labour among primigravida mothers. Quasi experimental research design was adopted. The study was conducted in maternity ward of GGSMCH, Faridkot, Punjab. The investigator selected 60 samples, 30 in control group and 30 in experimental group who fulfilled the inclusion criteria by using Convenience sampling technique. Prior to data collection procedure, researcher gave self introduction to each primigravida mother and explained the purpose of the study. Socio demographic data sheet was used to collect demographic variables; WHO modified partograph was used to assess the effectiveness of ambulation and birthing ball on the fetomaternal outcome. The collected data were analyzed and interpreted by using descriptive and inferential Statistics Data Analysis & Interpretation Selection and Development of Tools Section-A: The socio demographic data sheet was used to collect demographic variables such as age, education level, religion, family income, type of family, residence, age at marriage, duration between marriage and conception, occupation. Section-B: It consists of Section B (1) - WHO modified Partograph to assess fetomaternal outcome (Standardized tool). Section B (2) - The Simplified partograph to interpret the parameters of fetomaternal outcome

Results

Table 1: Frequency and percentage distribution of primigravida mothers according to selected socio – demographic variables N = 60

S. No	Variables	GROUP 1		GROUP 2		Chi square & p values
		n=(30)	%	n=(30)	%	
1.	Age In Years					
	18-23	18	60	23	76.7	$\chi^2=2.210$
	24-29	09	30	06	20.0	p values = 0.331
	30-35	03	10	01	3.3	df = 2
2.	Educational Status					
	Illiterate	08	26.7	07	23.3	$\chi^2= 2.985$
	Primary school	08	26.7	11	36.7	p values = 0.702
	Secondary school	04	13.3	05	16.7	df = 5
	Higher secondary	06	20.0	06	20.0	
	Graduate	02	6.7	01	3.3	
3.	Religion					
	Sikh	26	86.7	26	86.7	$\chi^2= 0.000$
	Muslim	-	-	-	-	p values= 1.000
	Hindu	04	13.3	04	13.3	df =1
	Christian	-	-	-	-	
4.	Others (specify)	-	-	-	-	
	Monthly Family Income (in rupees)					
	≤5000	11	36.7	07	23.3	$\chi^2= 7.060$ p values = 0.070 df = 3
	5001-10,000	09	30.0	19	63.3	
	10,001-15,000	07	23.3	03	10.0	
	15,001-20,000	03	10.0	01	3.3	
20,001-25,000	-	-	-	-		
25,001 and above	-	-	-	-		
5.	Type of Family					
	Joint	25	83.3	23	76.7	$\chi^2= 0.417$ p values =0.519 df = 1
	Nuclear	05	16.7	07	23.3	
	Extended	-	-	-	-	
6.	Area of Residence					$\chi^2= 1.200$

	Urban	12	40.0	08	26.7	p values = 0.273 df = 1
	Rural	18	60.0	22	73.3	
	Age At Marriage					$\chi^2= 1.543$ p values = 0.462 df = 2
7.	≤ 20yrs	16	53.3	19	63.3	
	21-25yrs	09	30.0	09	30.0	
	26-30yrs	05	16.7	02	6.7	
	31-35yrs	-	-	-	-	
	Duration Between Marriage and Conception					$\chi^2= 1.564$ p values = 0.668 df =3
8.	1-6months	21	70.0	18	60.0	
	7-12months	02	6.7	04	13.3	
	13-18months	05	16.7	07	23.3	
	19-24months	-	-	-	-	
	>24months	02	6.7	01	3.3	
	Occupation					$\chi^2= 1.018$ p values = 0.601 df = 2
9.	Housewife	28	93.3	29	96.7	
	Govt. employee	-	-	-	-	
	Private employee	01	3.3	-	-	
	Labourer	-	-	-	-	
	Self employed	01	3.3	01	3.3	

Chi-Square Test: $p > 0.05$; Not significant

Table 1, depicts that the sample in both the groups were homogenous match of population.

Table 2: Frequency and percentage distribution of fetomaternal outcome among primigravida mothers in group 1 and group 2 N = 60

S. No	Fetomaternal Outcome (Pre intervention)	GROUP 1		GROUP 2		Chi square & p values
		n=(30)	%	n=(30)	%	
1	FHR					$\chi^2= 0.089$ p values = 0.766 df = 1
	<120	-	-	-	-	
	120-140	22	73.3	23	76.7	
	141-160	8	26.7	7	23.3	
	>160	-	-	-	-	
2	Rate of cervical dilatation					-
	<1cm/hr	30	100	30	100	
	1cm/hr	-	-	-	-	
	>1cm/hr	-	-	-	-	
3	Descent of head					$\chi^2= 0.733$ p values = 0.693 df = 2
	-2 station	07	23.3	05	16.7	
	-1 station	19	63.3	19	63.3	
	0 station	04	13.3	06	20.0	
	+1 station	-	-	-	-	
	+2 station	-	-	-	-	
	+3 station	-	-	-	-	
4	Intensity of uterine contractions					$\chi^2=2.700$ p values = .100 df = 1
	Mild	23	76.7	17	56.7	
	Moderate	07	23.3	13	43.3	
	Severe	-	-	-	-	

Chi-Square Test: NS: $p > 0.05$; Not significant

Table 2, depicts that there was insignificant difference ($p > 0.05$) between two groups before the intervention with regard to all variables.

Table 3: Comparison of pre and post intervention fetomaternal outcome in group 1

S. No	Fetomaternal Outcome	Pre-intervention		Post-intervention		Z value	P value
		N	%	N	%		
1	FHR					0.832	0.405 ^{NS}
	<120	-	-	-	-		
	120-140	22	73.3	25	83.3		
	141-160	8	26.7	5	16.7		
	>160	-	-	-	-		
2	Rate of cervical dilatation					4.158	<0.001**
	<1cm/hr	30	100	09	30.0		
	1cm/hr	-	-	13	43.3		
	>1cm/hr	-	-	08	26.7		
3	Descent of head					4.858	<0.001**

	-2 station	07	23.3	-	-		
	-1 station	19	63.3	-	-		
	0 station	04	13.3	04	13.3		
	+1 station	-	-	13	43.3		
	+2 station	-	-	07	23.3		
	+3 station	-	-	06	20.0		
	+4 station	-	-	-	-		
	+5 station	-	-	-	-		
4	Intensity of uterine contractions					4.964	<0.001**
	Mild	23	76.7	-	-		
	Moderate	07	23.3	12	40		
	Severe	-	-	18	60		

Wilcoxon Signed Rank test: **p<0.001; Highly significant

Table 3, depicts that there was significant difference in rate of cervical dilatation, descent of head, intensity of uterine

contractions from pre and post intervention (p<0.001) in group 1. However there was no significant difference in FHR from pre and post intervention (Z value 0.832 and p value 0.405) in group 1.

Table 4: Comparison of pre and post intervention fetomaternal outcome in group 2

S. No	Fetomaternal Outcome	Pre-intervention		Post-intervention		Z value	P value
		N	%	N	%		
1	FHR					0.277	0.782 ^{NS}
	<120	-	-	-	-		
	120-140	23	76.7	22	73.3		
	141-160	7	23.3	8	26.7		
	>160	-	-	-	-		
2	Rate of cervical dilatation					4.932	<0.001**
	<1cm/hr	30	100	-	-		
	1cm/hr	-	-	16	53.3		
	>1cm/hr	-	-	14	46.7		
3	Descent of head					4.849	<0.001**
	-2 station	05	16.7	-	-		
	-1 station	19	63.3	-	-		
	0 station	06	20.0	04	13.3		
	+1 station	-	-	06	20.0		
	+2 station	-	-	12	40.0		
	+3 station	-	-	07	23.3		
	+4 station	-	-	01	3.3		
+5 station	-	-	-	-			
4	Intensity of uterine contractions					4.862	<0.001**
	Mild	17	56.7	-	-		
	Moderate	13	43.3	06	20		
	Severe	-	-	24	80		

Wilcoxon Signed Rank test: **p<0.001; Highly significant

Table 4, depicts that there was significant difference in rate of cervical dilatation, descent of head, intensity of uterine

contractions from pre and post intervention (p<0.001) in group 2. However there was no significant difference in FHR from pre and post intervention (Z value 0.277 and p value 0.782) in group 1.

Table 5: Comparison of post intervention fetomaternal outcome in group 1 and group 2

S. No	Fetomaternal Outcome (Post intervention)	Group 1		Group 2		Chi square & p values
		n = (30)	%	n = (30)	%	
1	FHR					$\chi^2 = 0.884^{NS}$ p values = 0.347 df = 1
	<120	-	-	-	-	
	120-140	25	83.3	22	73.3	
	141-160	5	16.7	8	26.7	
	>160	-	-	-	-	
2	Rate of cervical dilatation					$\chi^2 = 10.947$ p values = 0.004* df = 2
	<1cm/hr	09	30	-	-	
	1cm/hr	13	43.3	16	53.3	
	>1cm/hr	08	26.7	14	46.7	
3	Descent of head					$\chi^2 = 4.972^{NS}$ p values = 0.290 df = 4
	-2 station	-	-	-	-	
	-1 station	-	-	-	-	
	0 station	04	13.3	04	13.3	
	+1 station	13	43.3	06	20.0	
	+2 station	07	23.3	12	40.0	

	+3 station	06	20.0	07	23.3	
	+4 station	-	-	01	3.3	
	+5 station	-	-	-	-	
4	Intensity of uterine contractions					$\chi^2 = 2.857^{NS}$ p values = 0.091 df = 1
	Mild	-	-	-	-	
	Moderate	12	40	06	20	
	Severe	18	60	24	80	
5	Duration of first stage of labour					$\chi^2 = 9.785$ p values = 0.020* df = 3
	7-9hrs	02	6.7	08	26.7	
	10-12hrs	08	26.7	12	40.0	
	13-15hrs	16	53.3	10	33.3	
	16or above	04	13.3	-	-	

Chi-Square Test: * $p < 0.05$; Significant

From the table 5, it was observed that there was high statistical significant difference found between group 1 and group 2 in rate of cervical dilatation (χ^2 value 10.947 and p value 0.004) and duration of first stage of labour (χ^2 value 9.785 and p value 0.020) after intervention ($p < 0.05$).

Acknowledgement

We will like to extend our sincere gratitude to all the participants for taking part in our study and making this study a success. We will also like to thank all the concerned authorities for granting permission to conduct this research.

Discussion

Ambulation or upright positions during labour have a number of physiological benefits, including the effect of gravity and increased pelvic dimensions, which may help your baby to come down and decreases the need for instrumental deliveries [2]. In present study birthing ball was found effective in improving fetomaternal outcome in comparison with ambulation, concerning Intensity of uterine contraction (χ^2 value 10.947 and p value 0.004) and duration of first stage of labour (χ^2 value 9.785 and p value 0.020) as statistically significant difference has been found in group 1 and group 2. These findings were found consistent with the study conducted by Rania E. Farrag (2018) [7] whose results revealed a high significant statistical difference in labour outcome between the two groups concerning the improvement of the dilatation of the cervix ($p < 0.001$), fetus head descent ($p < 0.001$) and decrease in duration of the first and second stage of labour ($p < 0.001$), in the study sample (3.01 ± 1.21 & 4.32 ± 1.65 hr., first stage for study and control group respectively) and (25.32 ± 12.51 & 29.65 ± 11.54 min., second stage for study and control group respectively). Hence, this study concludes that birthing ball is effective in improving labour outcome.

Conclusion

Labour being the end of the long expectation of pregnancy, marks the beginning of the extra uterine life of the newborn. To mark a good beginning, the process and experience of labour should not be a misery for the mother. There are a variety of discomforts that a woman will experience during labour. Reducing these discomforts is an important part of good nursing care. Nonpharmacological methods, such as walking and using a birthing ball, help reduce nonconforming situations by shortening labor duration [2]. Moving and changing positions as a nonpharmacological method helps in reducing maternal pain prevent the excessive fear of giving birth and fulfill the psychological and emotional dimensions of care [8]. Nurses should play a vital role in progress of labour and reduction labour pain

with the use of nonpharmacological methods such as birthing ball, ambulation, reflexology, musical therapy, hydrotherapy. Maternal and child health unit should be motivated to utilize non pharmacological methods to facilitate progress of labour and reduction of labour pain.

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