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Prospective study of different postures during the second stage of labour and their outcome

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Abstract

Background: For centuries, there has been controversy around whether being upright (sitting, birthing stools, chairs, squatting) or lying down have advantages for women delivering their babies. To assess the benefits and risks of the use of different positions during the second stage of labour (i.e. from full dilatation of the cervix).

Aim of the study: To study the effect of various postures during the second stage of labour. To compare the duration of the second stage of labour, maternal and fetal outcome in different postures.

Materials and Methods: 400 women in labour are studied as to the labour pattern and delivery in different postures. All subjects are matched according to age and parity.

Study Design: Prospective Study.

Results and Conclusion: Women in squatting position and sitting position had number so intact perineum and no one had episiotomy especially multigravida. Pain perception using the visual analog scale was found to be more in supine, knee elbow position. Overall satisfaction was found better in squatting position than sitting, knee-elbow position in decreasing order. Age group preferred equally position between 26 – 30 years. Multigravida patients preferred squatting posture than any other postures, due to their previous birth experience in the supine position. Primigravida patients preferred the supine position mostly. Blood loss in each posture compared by using under buttock drape. No one presented with postpartum haemorrhage. More comfortable posture during the second stage of labour can be chosen by a mothers by using this study. Because the preference of birthing posture is a basic right of the patient. Duration of the second stage of labour is reduced in squatting and sitting position.

Keywords: Sitting, birthing stools, chairs and squatting

Introduction

Normal Physiological process of labour divided into 4 stages. The second stage of labour begins when the cervix is completely dilated and ends in the birth of a baby. The second stage is often divided into Passive Phase and Active Phase. They are Passive Phase (Period of laboring down, the period of rest), Active Phase (When baby rotates, descends toward the pelvic floor), Feeling of the urge to push (Cochrane Database Sys. Rev. 2017) ^[1] and Upright positions in labour and their benefits. Giving birth in an upright position can benefit the mother and baby for several physiological reasons. MRI studies have shown that compared to the supine position, the dimension of the pelvic outlet become wider in the squatting and knee elbow and sitting position. (Gupta *et al.*, 2017) ^[1]. Upright position increase maternal satisfaction and more positive consequences. This research paper analysis and evaluate different positions used in the second stage of labour about the effectiveness, advantages and disadvantages. One of the possible way to clarify birthing positions in whether the body weight is on or off the sacrum, or the large tail bone at the base of the spine positions that take the weight off the sacrum and allow the pelvis to expand might make spontaneous birth more likely such are squatting, Sitting, Knee elbow, Non-flexible sacrum positions rest the more weight on the tailbone, Supine, Semi Sitting in bed, Lithotomy (Edquist *et al.*, 2016) ^[2]. Changes during labour to enhance maternal comfort and promote optimal positioning of the baby as long as they do not hinder monitoring and there are no complications. RCOG recommends the use of active and upright positions to assist with labour and delivery. The WHO concludes that women in labour should adopt any position they like, while preferably avoiding long periods of lying supine (WHO, 1996) ^[26].

Duration of the second stage of labour

The period between full cervical dilatation to the birth of a baby, during which the woman has an involuntary urge to bear down as a result of expulsive contractions. It lasts from 20 minutes to 2 hours ^[1]. Maternal Pelvis (Marco A. Siccarde *et al.*). Pelvic inlet the anatomical limit between the true pelvis below and false pelvis above. The dimension of its AP, Oblique, Transverse diameter varies according to the morphology of pelvis. Classification according to Caldwell and Mccoy. There is radiological evidence that the intrapelvic space changes with the posture of the subject. (Marie Franz *et al.*, Gyene, Obset 2017 Feb).

The pelvis is anatomically divided into a false pelvis and a true pelvis, the boundary line being the brim of the pelvis. The bony landmarks on the brim of the pelvis from anterior to posterior on each side are the upper border of the symphysis pubis, pubic crest, public tubercle, pectineal line, iliopubic eminence, iliopectineal line, Sacro-iliac articulation, antero border of the ala of the sacrum and sacral promontory. False Pelvis formed by iliac portions of the innominate bones and is limited above by the iliac crests. It has got little obstetric significance. True Pelvis, as it forms the canal through which the fetus has to pass. It is shallow in front, formed by symphysis pubis and measures 4 cm. Deep posteriorly formed by the sacrum and coccyx and measures 11.5cm.

Maternal pelvis

Pelvic inlet: The line between the narrowest bony points formed by the sacral promontory and the inner pubic arch is termed obstetrical conjugate: It should be 11.5 cm or more. This anteroposterior line at the inlet is 2 cm less than the diagonal conjugate (distance from undersurface of the pubic arch to sacral promontory). The transverse diameter of the pelvic inlet measures 13.5 cm.

Midpelvis: The line between the narrowest bone points connects the ischial spines; it typically exceeds 12 cm.

Pelvic outlet: The distance between the ischial tuberosities (normally > 10 cm) and the angulation of the pubic arch.

Aim of the study

- To study the effect of various postures during the second stage of labour.
- To compare the duration of the second stage of labour, maternal and fetal outcome in different postures.

Study design: Prospective Study

Materials and methods**Sample size and subject selection**

400 women in labour are studied as to the labour pattern and delivery in different postures. All subjects are matched according to age and parity.

Materials

- Delivery Table
- Partograph
- Conventional CTG
- AMTSL

Method

Conducting normal vaginal deliveries by using birthing positions such as squatting, sitting, knee-elbow position and supine

position in women who have come with labour pain for safe confinement.

Inclusion criteria

- Age varies from 25 to 35 years
- Height – 150 to 165 cms
- Primigravida
- Multigravida
- No medical or surgical illness
- BMI – 18 to 30 kg/m²

Exclusion Criteria

- Elderly Primi
- Short Stature
- Bad Obstetric History
- Teenage Pregnancy
- Contraindications for positions
- Contraindications for Vaginal delivery
- Medical or surgical conditions for contraindication
- Patient in labour induction
- Previous Caesarean section

Methodology

All the enrolled patients have been properly informed about the aim of the study and women were counselled for this study at the antenatal visit or in early labour. The study was explained to them and informed consent obtained for conducting delivery at any position. 100 women allocated for each posture. Written consent was obtained for the preferred posture. All four groups were similar in all obstetric parameters. Both primi and multigravida were included, but the majority of the women in the study are multigravida because they can compare the previous birthing experience with the present until the beginning of the second stage of labour women encouraged to walk, sit. Routine management of labour was unchanged.

Supine

In this position mother in supine posture on the delivery table with a birth companion.

Squatting

Mother parturates in squatting position during 2nd stage of labour holding on to handle at the sides of delivery table supported by a birth companion, she squatted during contractions and bore down allows encourages to sit back and rest in between contractions. During delivery, perineum can be supported or episiotomy can be given as baby is delivered in a lithotomy position. Episiotomy suturing in the lithotomy position.

Sitting

Mother is in sitting posture during the second stage of labour on the delivery table. During contractions, the patient is asked to bear down and to rest in between contractions. Episiotomy can be given and baby delivered in the lithotomy position. Placenta delivered in the lithotomy position.

Knee elbow position

In this position, women are kneeling and bent forward to support her weight with the arm. It reduces the effect of gravity, duration of contraction, pain due to fetal pressure. It favours fetal internal rotation. This is the preferred position to increase the pelvic anteroposterior diameter in expulsive phase.

Results and analysis

Table 1: Age group distribution Vs. Group

Age group	Posture								χ^2 Test P-value
	Knee elbow		Sitting		Squatting		Supine		
	No	%	No	%	No	%	No	%	
<=20	1	1.2	3	3.8	4	3.5	6	5.0	0.650
21-25	13	15.1	11	13.9	15	13.2	26	21.5	
26-30	45	52.3	41	51.9	64	56.1	60	49.6	
31-35	27	31.4	24	30.4	31	27.2	29	24.0	
Total	86	100	79	100	114	100	121	100	
Mean±SD	28.77±3.54		28.61±3.65		28.40±3.58		27.64±4.07		0.131 Anova

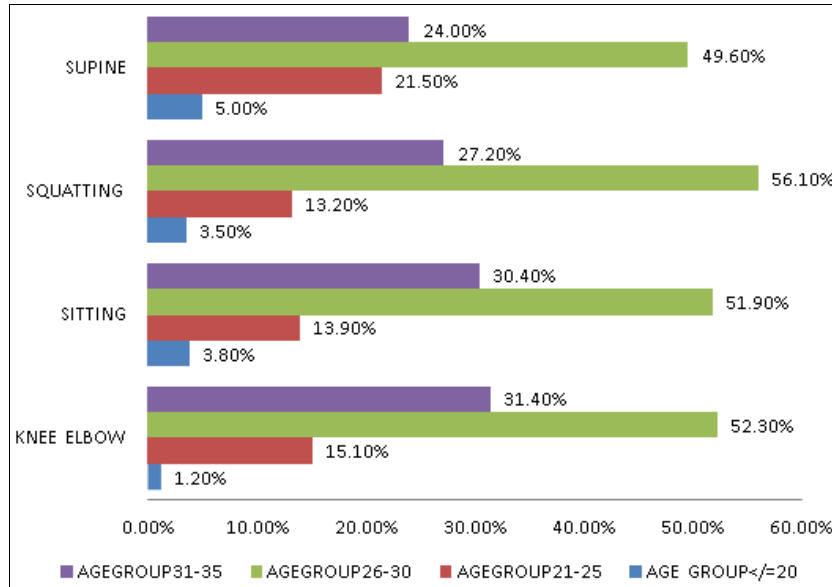


Chart 1: Age distribution Vs. Group

Table 2: Gravida Vs. Group

Gravida	Posture								χ^2 Test P value
	Knee elbow		Sitting		Squatting		Supine		
	No	%	No	%	No	%	No	%	
MULTI	50	58.1	47	59.5	74	64.9	69	57.0	0.631
PRIMI	36	41.9	32	40.5	40	35.1	52	43.0	
Total	86	100	79	100	114	100	121	100	

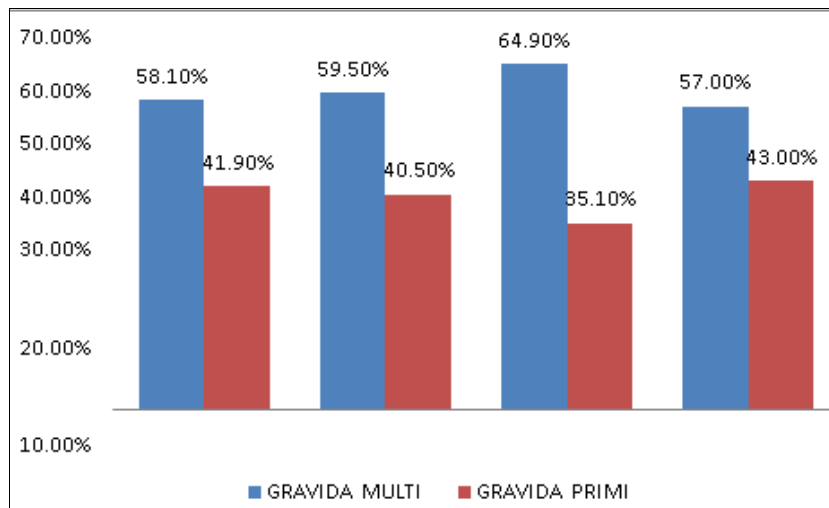


Chart 2: Gravida Vs. Group

Inference

Multigravida mothers are comfortable with squatting and sitting position, then the supine posture. 114 patients preferred

squatting positions out of 114, multigravida – 74, primigravida – 40, Second most common posture preferred by multigravida and primigravida is the supine position.

Table 3: Need Episiotomy vs. Group

Need for episiotomy	Posture								χ^2 Test P value
	Knee elbow		Sitting		Squatting		Supine		
	No	%	No	%	No	%	No	%	
Yes	71	82.6	46	58.2	44	38.6	89	73.6	<0.001
No	15	17.4	33	41.8	70	61.4	32	26.4	
total	86	100	79	100	114	100	121	100	

Interposture comparison-chisquare test p value					
Knee Elbow Vs Sitting	Knee Elbow Vs Squatting	Knee Elbow Vs Supine	Sitting Vs Squatting	Sitting Vs Supine	Squatting Vs Supine
0.001	<0.001	0.128	0.007	0.024	<0.001

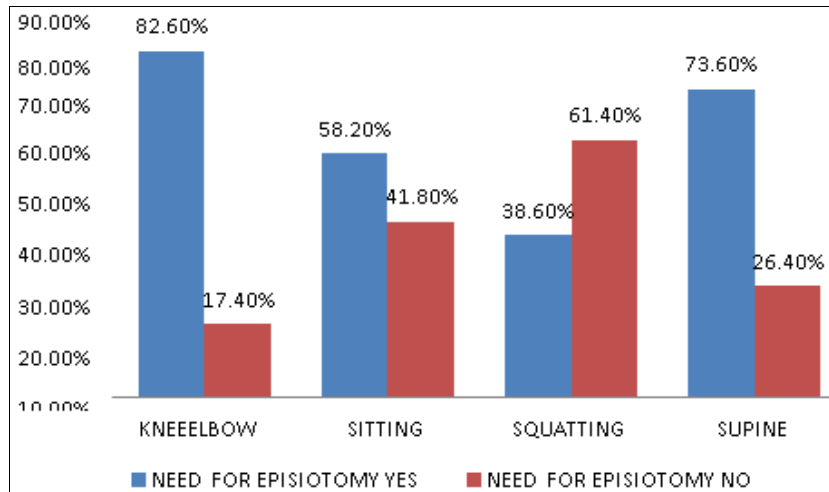


Chart 3: Need Episiotomy vs. Group

Inference

Multigravida mothers are comfortable with squatting and sitting position, then the supine posture. 114 patients preferred squatting positions out of 114, multigravida – 74, primigravida – 40, Second most common posture preferred by multigravida and primigravida is the supine position.

Inference

Among the positions, sitting posture, squatting posture had more number of intact perineum. Need for episiotomy is less with sitting and squatting position than supine posture.

Table 4: Apgar 1st Minute Vs. Group

Posture	Apgar 1 st minute	ANOVA test p value (overall)
Knee elbow	7.31+/-0.51	<0.001
Sitting	7.75+/-0.51	
Squatting	7.98+/-0.38	
Supine	7.59+/-0.57	

Interposture comparison-post hoc tukey test					
Knee Elbow Vs Sitting	Knee Elbow Vs Squatting	Knee Elbow Vs Supine	Sitting Vs Squatting	Sitting Vs Supine	Squatting Vs Supine
<0.001	<0.001	0.001	0.009	0.133	<0.001

Table 5: Apgar 5th Minute Vs. Group

Posture	Apgar 5 th minute	ANOVA test p value (overall)
Knee elbow	8.27+/-0.54	<0.001
Sitting	8.78+/-0.41	
Squatting	8.96+/-0.18	
Supine	8.72+/-0.50	

Interposture comparison-post hoc tukey test					
Knee Elbow Vs Sitting	Knee Elbow Vs Squatting	Knee Elbow Vs Supine	Sitting Vs Squatting	Sitting Vs Supine	Squatting Vs Supine
<0.001	<0.001	<0.001	0.022	0.712	<0.001

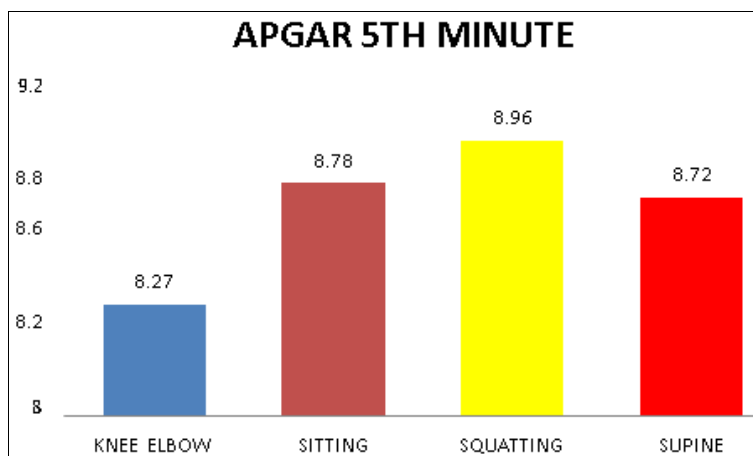


Chart 4: Apgar 5th Minute Vs. Group

Inference

5 min and 1 min APGAR is better with squatting position in comparison with supine position. p value is <0.001 which is statistically significant.

Table 6: Duration of 2nd stage of labour vs. Group

Posture	Duration of 2 nd stage of labour	ANOVA test p value (overall)
Knee Elbow	66.34+/-36.23	<0.001
Sitting	36.33+/-21.24	
Squatting	31.75+/-20.00	
Supine	63.47+/-37.28	

Interposture comparison-post hoc tukey test					
Knee Elbow Vs Sitting	Knee Elbow Vs Squatting	Knee Elbow Vs Supine	Sitting Vs Squatting	Sitting Vs Supine	Squatting Vs Supine
<0.001	<0.001	0.906	0.727	<0.001	<0.001

Conclusion

Duration of the Second stage in labour reduced in squatting position than in sitting position than supine posture. 1 minute Apgar, 5 minutes Apgar better in squatting position than in sitting position. 3rd degree, perineal tear, episiotomy are less in squatting, sitting position than supine and knee-elbow position. Maternal satisfaction is more in non-conventional postures like squatting, sitting, knee-elbow position than the supine position. Need for episiotomy is increasing in trend from sitting, squatting to knee elbow. Women in squatting, sitting had intact perineum and minimal perineal tear whereas women in supine position had higher degrees of perineal lacerations which is statistically significant.

Women in squatting position and sitting position had number so intact perineum and no one had episiotomy especially multigravida. Pain perception using the visual analog scale was found to be more in supine, knee elbow position.

Overall satisfaction was found better in squatting position than sitting, knee-elbow position in decreasing order. Age group preferred equally position between 26 – 30 years. Multigravida patients preferred squatting posture than

Any other postures, due to their previous birth experience in the supine position. Primigravida patients preferred the supine position mostly. Blood loss in each posture compared by using under buttock drape. No one presented with postpartum haemorrhage.

More comfortable posture during the second stage of labour can be chosen by a mothers by using this study. Because the preference of birthing posture is a basic right of the patient. Duration of the second stage of labour is reduced in squatting and sitting position.

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