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Original Article

Obstetrics and Gynaecology Section

Factors Influencing the Delivery and Obstetric Outcome in Pregnant Women with Persistent Foetal Occiput Posterior Position: A Prospective Cohort Study

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ABSTRACT

Introduction: Occiput posterior position is the most common malposition encountered in labour and have a higher predisposition for caesarean delivery than in occiput anterior position.

Aim: To evaluate the effect of maternal and foetal factors on the delivery and obstetric outcome in persistent occiput posterior position at term labouring mothers.

Materials and Methods: The prospective cohort study was carried out at Father Muller Medical College Hospital, Mangalore, Karnataka, India, from November 2015 to November 2017. Thousand antenatal mothers carrying singleton, vertex presentation in labour were monitored. Antenatal factors affecting the occiput posterior position like diet and antenatal exercise were noted. They were observed throughout the 1st stage and 2nd stage of labour. The birth weight as a foetal factor affecting the delivery outcome was noted and data were analysed. Categorical data was analysed using the Chi-square test. The t-test was used for continuous data.

Results: Of the 1000 antenatal mothers 67 (6.7%) were occiput posterior group. There was a higher need for induction among occiput posterior group (35.8%) as compared to occiput anterior group (15.7%) (p-value <0.001). Mothers in occiput posterior group had higher instrumental vaginal delivery (28.3%) as compared to occiput anterior group (2.8%) (p-value <0.001). Neonatal Intensive Care Unit (NICU) admission was higher in the occiput anterior group (5.7%) as compared to the occiput posterior group (4.9%), which is significant (p-value=0.003).

Conclusion: The general physical activity done during the antenatal period may not appear to have an effect on the rotation of the occiput posterior position and for vaginal delivery. Counselling and special obstetric care with persistent occiput posterior position is required for improved obstetric outcome.

Keywords: Dystocic labour, Occiput posterior position, Second stage labour, Vertex malposition

INTRODUCTION

Over 95% of the foetuses are in cephalic presentation at term. Occiput posterior position is the most common malposition encountered in labour. Its incidence at delivery ranges from 1.8-6% [1-3]. Malposition in cephalic presentation is one of the common indications for caesarean section for dystocic labour. Occiput posterior position has a significantly higher predisposition for caesarean delivery than occiput anterior [1]. In a study, it has been shown that the incidence of caesarean section was threefold higher and the incidence of operative vaginal delivery was two-fold higher in occiput posterior than occiput anterior position [3].

Many studies have focused on the obstetric outcome in persistent occiput posterior position [1,2,4]. However, seldom trials have focused on the associated maternal and foetal factors that are of paramount importance in influencing persistent occiput posterior position. Hence, the present study was conducted to determine the critical role of maternal and foetal factors on the mode of delivery and its outcome in persistent occiput posterior position.

MATERIALS AND METHODS

The present prospective cohort study was carried out at Father Muller Medical College Hospital, Mangalore, Karnataka, India, from November 2015 to November 2017. Institutional Ethical Committee clearance was obtained with reference no FMMC/CCM/665/2015. It was a time-bound study and a total of 1000 antenatal mothers carrying singleton, vertex presentation in labour were monitored after obtaining written informed consent during the study period.

Inclusion and Exclusion criteria: All term mothers on arrival at the delivery ward for either spontaneous or induced labour were included in the study as per the inclusion criteria i.e., term gestation, live, singleton pregnancy and vertex presentation. Antenatal mothers with intrauterine growth restriction, preeclampsia/eclampsia, anomalous baby, and contracted pelvis were excluded from the study.

Study Procedure

At the time of arrival to the delivery room, maternal demographic factors were noted about age and parity. After the detailed obstetric history, personal history was taken which included: Dietary details, physical activity during antenatal period, categorised into: less than routine activity/routine activity or more than routine activity. In general physical examination-height and weight at the time of admission were noted and Body Mass Index (BMI) was calculated accordingly. Systemic examination was done. Digital vaginal examination was done to note the position of foetus if possible, provided there is adequate dilatation of cervix. Then in this study, the antenatal mothers were segregated into occiput anterior and occiput posterior. All the groups were observed throughout their 1st and 2nd stage of labour. After delivery, mothers were categorised into occiput anterior and persistent occiput posterior, depending upon the position of foetus during delivery.

After the delivery, the following parameters were analysed: Comparison of maternal demographic factors and accessory factors such as diet, and physical activity during the antenatal period. Other factors such as need for oxytocin induction/augmentation, duration of labour (1st stage and 2nd stage), perineal laceration, postpartum

haemorrhage were analysed between occiput anterior and occiput posterior groups.

STATISTICAL ANALYSIS

Statistical analyses were presented as mean and standard deviation. Categorical data were presented as frequency and percentage. Categorical data was analysed using the Chi-square test. The t-test was used for continuous data. The statistical software Statistical Package for Social Sciences (SPSS) version 18.0 was used for data analysis.

RESULTS

A total of 1000 antenatal mothers in labour were analysed. A total of 67 patients (6.7%) had persistent occiput posterior position at delivery. Occiput posterior group had lower mean height as compared to occiput anterior group which is statistically significant (p=0.015) [Table/Fig-1]. Diet as a factor was compared in this study between both the groups, and found that higher percentage of women in the occiput anterior group (99.8%) consumed mixed diet compared to occiput posterior group (98.5%) [Table/Fig-2].

Demographic factors		Occiput posterior (n=67)	Occiput anterior (n=933)	p-value
Mean age		25.49±3.67	26.043±3.38	0.89*
Mean height		152.94±5.065	155.48±5.707	0.015*
Mean BMI		28.16±2.215	27.23±2.031	<0.001*
Parity	Nulliparous	45 (67.16%)	594 (63.6%)	<0.001
	Parous	22 (32.8%)	339 (36.3%)	
	Gestational age	37-38 weeks 1 (1.50%)	37-38 weeks 141 (15.11%	0.001
		38-39 weeks 19 (28.35%)	38-39 weeks 266 (28.50%)	
		39-40 weeks 25 (37.30%)	39-40 weeks 371 (39.76%)	
		>40 22 (32.83%)	>40 155 (16.60%)	

[Table/Fig-1]: Comparison of various demographic factors between occiput posterior and occiput anterior position.
BMI: Body mass index; *t-test was used. For rest Chi-square test was used

Parameters		Study (OP) (n=67)	Control (OA) (n=933)	p-value
Activity	Less than routine activity	49 (73.1%)	594 (63.70%)	0.289
	Routine activity	18 (26.8%)	338 (36.20%)	
	More than routine activity	0	1 (0.10%)	
Diet	Veg	1 (1.49%)	1 (0.10%)	0.014
	Mixed	66 (98.5%)	932 (99.8)	

[Table/Fig-2]: Antenatal factors affecting occiput posterior position.
Chi-square test was used

There was a higher need for induction among occiput posterior group (35.8%) as compared to occiput anterior group (15.7%) with a highly significant p-value <0.001. Mothers in occiput posterior group had higher instrumental vaginal delivery (28.3%) as compared to occiput anterior group (2.8%) which is highly significant (p-value <0.001) [Table/Fig-3]. NICU admission was higher in occiput anterior group (5.7%) as compared to occiput posterior group (4.9%), which is significant (p-value=0.003) [Table/Fig-4].

In this study, mean height of the mother, mean body mass index of the mother and mean birth weight of the new born were analysed as individual variables with their influence on delivery outcome. The present observational analysis showed that the mean height of the mothers was lower among mothers who underwent Caesarean section as compared to vaginal delivery (p=0.416). It was found that there was a lower mean birth weight of newborns among women who

Parameters		Study OP (n=67)	Control OA (n=933)	p-value
Induced		24 (35.8%)	147 (15.7%)	<0.001
Length of labour	1st stage >12 hr	25 (37.3%)	1 (0.17%)	<0.001
	2nd stage >2hr	3 (4.47%)	0	<0.001
Oxytocin augmentation		67 (100%)	929 (99.5%)	0.2
Delivery	Spontaneous	18 (26.8%)	891 (95.4%)	<0.001
	Instrumental	19 (28.3%)	27 (2.8%)	<0.001
	Caesarean section	30 (44.7%)	15 (1.6%)	<0.001
Perineal tears		2 (5.4%)	3 (0.32%)	<0.001
PPH		4 (5.9%)	3 (0.32)	<0.001

[Table/Fig-3]: Obstetric outcome between occiput posterior and occiput anterior groups.
PPH: Postpartum haemorrhage; Chi-square test was used

Parameters			Study (OP) (n=67)	Control (OA) (n=933)	p-value
Mean birth weight			3.19±0.38	3.010±0.323	0.0002*
Apgar	1 min	0-6	9 (13.43%)	12 (1.28%)	<0.001
		7-10	58 (86.56%)	921 (98.7%)	1.6
	5 min	0-6	1 (1.4%)	2 (0.214%)	<0.001
		7-10	66 (98.50%)	931 (99.7%)	1.2
NICU admission			10 (4.90%)	53 (5.7%)	0.003

[Table/Fig-4]: Neonatal outcome.
*t-test was used. For rest Chi-square test was used

underwent Caesarean section as compared to those with the vaginal delivery (p-value=0.362) [Table/Fig-5]. The major cause for caesarean section in occiput posterior group was secondary arrest of cervical dilatation (50%) and deep transverse arrest (30%) [Table/Fig-6].

Parameters	Vaginal delivery n (SD)	Caesarean section n (SD)	p-value
Mean height	153.37 (12.4)	152.4 (11.8)	0.416
Mean BMI value	28.16 (2.4)	28.2(2.2)	0.963
Mean birth weight of the newborn (kg)	3.236 (0.21)	3.149 (0.32)	0.362

[Table/Fig-5]: Association of factors affecting delivery outcome in occiput posterior group.
t-test was used

Cause for caesarean section	Number	Percentage
Secondary arrest of cervical dilatation	15	50%
Deep transverse arrest	9	30%
Pathological CTG	3	10%
Failed induction	2	6.4%
Arrest of descent	1	3.4%

[Table/Fig-6]: Major causes for caesarean section among occiput posterior group.
CTG: Cardiotocography

DISCUSSION

The present prospective study demonstrated an overall rate of 6.7% occiput posterior position at delivery. Various studies showed a prevalence ranging from 1.8 to 10.8% [1-3]. Its prevalence varies with the point of time when the diagnosis of occiput posterior position is made in the process of labour. These studies have quoted the prevalence rate taken at different point of the time in the process of labour. At the onset of labour, 15-20% of term foetuses in cephalic presentation are in occiput posterior position. But at the time of vaginal delivery, only 5% are in occiput posterior position, because most of them undergo spontaneous rotation to anterior position during labour [5,6].

Among demographic factors considering the age of the mother we have found that mean age between occiput posterior and

occiput anterior group were comparable. While studies conducted by Ponkey SE et al., showed an association of occiput posterior with older maternal age [1]. Cheng YW et al., showed that maternal age of above 35 years had a significant association with occiput posterior position [4]. BMI considered in the present study at the time of admission for delivery may not have an accurate reflection of body stature. We considered the same BMI due to non-availability of prepregnancy BMI. The proportion difference of mean BMI was found significantly higher among occiput posterior group. Similar association was found in a study conducted by Cheng YW et al., showed that maternal BMI greater than or equal to 29 had significant association with occiput posterior position [7]. Desbriere R et al., in their study found that BMI is an independent factor significantly associated with anterior rotation of foetal head during labour they concluded in their study that increase in BMI was associated with 6% decrease in the probability of anterior rotation of foetal head [8].

Significant higher percentage difference of occiput posterior position in primiparas conveys a higher tendency for the occiput posterior delivery in primiparous women or possibility of high rotation in the intrapartum period among parous women. Ponkey SE et al., concluded in their study that there was twofold higher rate of prevalence of occiput posterior in nulliparous as compared to multiparas [1]. Similar study conducted by Fitzpatrick M et al., showed that the incidence of persistent occiput posterior position was significantly greater among primiparas than multiparas [2].

In the present study we found that milder activity during antenatal period favoured occiput posterior position (73.1%) and more activity (58.4%) in antenatal period favoured occiput anterior position, however as this difference showed no significance, it is difficult to conclude the effect of physical activity during antenatal period that favours rotation of position from occiput posterior to occiput anterior. Significantly higher induction rate was found among occiput posterior group and all of those who delivered in occiput posterior position needed higher augmentation when compared to occiput anterior group [1-3,9]. As it is known that the effective uterine contraction is inherent or required for the favourable outcome in occiput posterior position, increase in the need of oxytocin in our study substantiates this.

It was observed that the prolonged 1st stage of labour was higher in occiput posterior group compared to occiput anterior group in the present study. The length of 2nd stage of labour was prolonged only in occiput posterior group. This is similar to the finding of other researchers [1,2,4,7,9]. This can be explained by the fact that the tendency for the deflexion and the engaging diameter in occiput posterior position becomes relatively wider. The maneuverer like moulding, the effective contractions could overcome this wider diameter and bring about vaginal delivery. Hence, tendency for prolonged duration of labour. The proportion of operative vaginal delivery and caesarean section was found to be significantly higher in occiput posterior group contributing for higher operative intervention in this group. Most of the studies have found significant higher operative intervention in occiput posterior group [1-3,9,10].

The other complications associated with occiput posterior position such as perineal tear showed higher tendency among occiput posterior group (5.4%) as compared to anterior (0.32%). This could be explained by the fact that the wider diameter of foetal head is expected to stretch the posterior perineum and cause more perineal trauma among occiput posterior group. On the contrary a retrospective study by Pearl ML et al., did not find an increased risk for severe perineal laceration with occiput posterior position [11].

Limitation(s)

The study had a limited number of participants, which could affect the generalisability of the findings. Results may not be representative of the broader population or diverse demographic groups.

CONCLUSION(S)

General physical activity done during antenatal period may not appear to have its effect on the rotation of occiput posterior and on the vaginal delivery. Counselling and special obstetric care with persistent occiput posterior position is required for improved obstetric outcome.

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