10.21761/jms.v2i02.1

ORIGINAL RESEARCH ARTICLE

Study of the Feto-maternal Outcome in Occipito-posterior Position at the Onset of Labor

Anshu Sharma[1], Shashi B. Arya[2*], Jai K. Goel[2], Mridu Sinha[3], Rajni Chaurasia[4]

ABSTRACT

Introduction: Childbirth is considered one of the most rewarding and memorable experiences in a woman's life. Labour is the process that leads to childbirth. Difficult labor, characterized by abnormally slow labor progress, is known as dystocia. Malposition refers to any position of the vertex other than flexed occipito-anterior (OA) one. It is a common obstetric belief that progression of labour is underpinned by fetal position.

Material and Methods: 100 term antenatal patients, 50 with occipito-posterior (OP), and 50 with an OA position, were included in the study admitted in the labor room from December 2015 to March 2017. After the recruitment of patients, detailed history, examination: general physical, per abdominal and per vaginal was done. All patients underwent ultrasonography to confirm the fetal position at the onset of labor. They were then followed up until birth to determine the outcome. The neonatal outcome was analyzed by Apgar score at 1,5 minutes of delivery, presence of caput succedaneum, and molding.

Results: Among total 100 cases, the proportion of vaginal delivery was more in OA group (74%) in comparison with OP group (42%). 40% of patients of OP group landed into cesarean delivery against 18% of patients of the OA group. 8% percent of patients had face to pubis delivery. The mean duration of labor is prolonged in study group i.e., 473.2 ± 1.84 minutes in the first stage, 29.4 ± 7.67 minutes in second stage and 5.70 ± 1.75 minutes in third stage *vs*. i.e., 376.8 ± 1.26 minutes in first stage, 24.79 ± 9.77 minutes in second stage and 5.20 ± 3.22 minutes in third stage of labor of control group.

Conclusion: The group with malposition showed prolongation of labor in comparison to OA position. A higher rate of cesarean delivery was observed in the study group because of preference for cesarean over instrumental delivery. The neonatal outcome was comparable in both groups. Only a few instrumental deliveries were noted because the art of instrumental delivery is dying in modern obstetrics.

Keywords: Fetal malposition, Occipito-posterior position, Operative delivery.

How to cite this article: Sharma A, Arya SB, Goel JK, Sinha M, Chaurasia R. Study of the feto-maternal outcome in occipito-posterior position at the onset of labor. SRMS Journal of Medical Sciences. 2017;2(2):61-65.

Source of support: Nil

Conflict of interest: None

[1]Junior Resident, [2]Professor, [3]Associate Professor, [4]Assistant Professor

Department of Obstetrics and Gynaecology, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Corresponding Author: Shashi Bala Arya, Department of Obstetrics and Gynaecology, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly, Uttar Pradesh, India, email: drshashibala@ymail.com

INTRODUCTION

Occipito-posterior (OP) fetal position occurs in 15-20% of women before labor at term.[1] Approximately 90-95% of these fetuses rotate during labor once the head reaches the pelvic floor.[1,2] Thus, the reported prevalence of OP position is 15–32% in the first stage of labor,[3] 10–20% early in the second stage of labor and 5–8% at delivery.[4]

Spontaneous rotation to OA is often a late phenomenon and may not occur until the second stage of labor. Although OP is more likely to persist in the late labor still 50–80% will spontaneously rotate to OA in the second stage of labor before delivery.[4-6] Various studies suggest that persistent OP position is associated with prolonged labor and an increased number of operative deliveries.[7-9] The operative delivery rate varies when OP position is present at delivery from 54–82%, compared with 6–22% for fetuses in an OA position. Abnormally prolonged labor, maternal and fetal exhaustion, instrumental delivery, emergency cesarean delivery, and severe perineal tears are the short and long term complications associated with it.[10,11] During the second stage of labour, the operative delivery rate is about 70% in OP position.

Ultrasonography is a noninvasive method and has been found to be more accurate in assessing position of fetal head during labor.[12,13] Besides, in the second stage, ultrasound determination of fetal head may allow safe instrumental delivery. Although the identification of OP before or during labor is not predictive of the same position at delivery, its early detection needs for greater monitoring of the labour.[14,15]

The literature confirms that OP represents an obstetric challenge because it is associated with an increased maternal-fetal and neonatal morbidity, and its management is still debated. The relationship between fetal position at the onset of labor and mode of delivery remains poorly explored and documented. Hence, this study was undertaken to determine if there is any association between fetal position at the onset of labor and delivery outcome for the mother and neonate.

MATERIAL AND METHODS

The present study was conducted on 100 term consecutive antenatal patients including 50 cases with OA position (control group) and 50 cases with OP position (study group) admitted for delivery in labor room, over 1 year in our tertiary care institute, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly.

The inclusion criteria were term gestation, singleton pregnancy, vertex presentation, OA position, OP position, at the onset of labor. The exclusion criteria were grand multipara, with malpresentation, obstetrical complications, induced labor, post-cesarean pregnancy, any medical or surgical illness, and intrauterine demise/ congenital fetal anomalies.

After the recruitment of the patient, detailed history, general physical examination, per abdomen obstetrics examination and vaginal examination, including the position and pelvic assessment was done. All patients were also subjected to ultrasound examination to confirm the fetal position. Ultrasound depiction of fetal head position was performed utilizing midline intracranial structures (cavsacrosciatum septum pellucidum, falxcerebri, thalami and cerebellar hemispheres) and anterior and posterior cranial structures (orbit, nasal bridge) and the cervical spine.

The management of labored patients was done according to the standard operative protocols (SOP) of our institute. In first stage of labor, the patient was examined per abdominally with vital monitoring every half-hourly; per vaginal examination was done every 3 to 4 hourly. In the second stage of labor, the patient was monitored every 15 to 30 minutes. Partogram was charted for every patient.

Abdominal and vaginal signs of fetal head rotation were noted in both groups. At the initiation of second stage of labor, patients with unfavorable factors for vaginal delivery at this stage, such as acute fetal distress, excessive caput, and molding, the station is too high; android pelvis was taken up for cesarean section. Patients were reassessed for favorable factors for vaginal delivery. The second stage of labor was monitored as usual hoping for face to pubis delivery or instrumental delivery in suspected cases of malposition.

Labor progress, time taken in first and second stage of labor, mode of delivery, maternal, and neonatal outcomes were documented.

RESULTS

In the present study of 100 patients in two groups, the demographic profile of patients was comparable (Table 1).

The presenting symptoms in control and study group were a pain in the lower abdomen (78 *vs.* 42%), leaking per vaginum (2 *vs.* 24%), or both (34 *vs.* 34%).

Left occipito anterior (26%) was the commonest fetal position confirmed on ultrasonography in control group followed by left occipito transverse (24%), right OA position (20%), right occipito transverse (16%) and OA (10%). In study group right OP (60%) was the commonest fetal presentation on ultrasonography followed by left OP (34%) and OP (6%). In the study group (OP fetal position), mal-rotation (50%), long anterior rotation (42%), and posterior rotation (8%) was seen.

Period of gestation and cervical dilatation were comparable in both groups while the type of pelvis in both groups were different, which was statistically significant with a p value of 0.042 (Table 2). The need to augment labor, methods employed in augmentation of labor, duration of labor, and mode of delivery were also different, which was statistically significant in both the groups (Table 3).

Fourteen percent of patients of control group and 30% patients of study group were taken up for cesarean

Table 1: Demographic profile of patients

Characteristics	*Control n (%)*	*Study n (%)*	*p-value*
Age (years) mean ± SD	24.40 ± 3.84	23.50 ± 4.71	0.908
Socio-economic status (Kuppuswamy scale)			
Lower	32 (64)	34 (68)	
Lower middle	10 (20)	12 (24)	
Upper lower	5 (10)	2 (4)	0.807
Upper middle	2 (4)	1 (2)	
Upper	1 (2)	1 (2)	
Parity			
0 – 1	40 (80)	33 (66)	
1 – 2	3 (6)	6 (12)	0.318
≥ 3	7 (14)	11 (22)	
Body mass index (BMI)			
≤ 18.9	00	00	
19.0 – 24.9	44 (88)	42 (84)	0.774
25 – 28.9	6 (12)	8 (16)	
≥ 29	00	00	

Table 2: Gynecological clinical parameters

Characteristics	*Control n (%)*	*Study n (%)*	*p-value*
Period of gestation			
37 - 38 weeks	11 (22)	15 (30)	
38 - 39 weeks	18 (36)	20 (40)	0.318
39 - 40 weeks	16 (32)	12 (24)	
≥ 40 weeks	05 (10)	03 (6)	
2 – 3	12 (24)	10 (20)	
3 – 4	28 (56)	32 (64)	0.715
≥ 4	10 (20)	8 (16)	
Type of pelvis			
Gynecoid	32 (64)	27 (54)	
Anthropoid	15 (30)	10 (20)	0.042
Android	2 (4)	10 (20)	
Platypelloid	1 (2)	3 (6)	

Table 3: Labor and mode of delivery

Characteristics	Control n (%)	Study n (%)	p-value
Need of augmentation of labor			
Spontaneous Progress	31 (62)	9 (18)	<0.001
AOL	19 (38)	41 (82)	
Method of augmentation of labor			
Medical method	12 (24)	26 (52)	
Surgical method	07 (14)	15 (30)	<0.001
Spontaneous progression	31 (62)	09 (18)	
Duration of labor (mins)			
Stage I	376.8 ± 1.26	473.2 ± 1.84	<0.001
Stage II	24.79 ± 9.77	29.4 ± 7.67	0.010
Stage III	5.20 ± 3.22	5.70 ± 1.75	0.337
Mode of delivery			
Vaginal delivery	37 (74)	21 (42)	
Cesarean delivery	09 (18)	20 (40)	
Instrumental delivery	04 (8)	05 (10)	0.004
Face to pubis delivery	00	04 (8)	

Table 4: Labor complications

Characteristics	Control n (%)	Study n (%)	p-value
Postpartum hemorrhage	2 (4)	4 (8)	0.677
Perineal tear	08 (16)	20 (40)	
Cervical tear	01 (2)	03 (6)	0.911
Vaginal tear	03 (6)	10 (20)	
Paraurethral tear	05 (10)	08 (16)	

Table 5: Neonatal outcomes

Characteristics	Control n (%)	Study n (%)	p-value
APGAR 1 minute			
≤ 7	8 (16)	6 (12)	0.564
>7	42 (84)	44 (88)	
APGAR 5 minutes			
≤ 7	1 (2)	1 (2)	1.0
>7	49 (98)	49 (98)	
APGAR score at 1, 5 minutes of delivery (mean ± SD)			
APGAR 1 min	7.56 ± 1.40	7.74 ± 0.80	0.433
APGAR 5 min	8.80 ± 0.70	8.84 ± 0.55	0.751
Caput formation			
Absent	42 (84)	35 (70)	0.096
Present	08 (16)	15 (30)	
Molding in fetus			
Absent	41 (82)	38 (76)	0.461
Present	9 (18)	12 (24)	

delivery in view of non-progress of labor, which included the arrest of dilatation, the arrest of descent, and deep, transverse arrest. Only 10% of patients of the study group and 4% of patients of the control group were taken up for cesarean section for fetal distress. The difference for an indication of the cesarean section between the two groups was statistically not significant.

No significant difference in labor complications in the form of postpartum hemorrhage and perineal trauma was seen in control and study groups (4% *vs.* 8%; p = 0.68). The difference in neonatal outcomes was also not statistically significant in either group (Tables 4 and 5).

DISCUSSION

Fetal position throughout labor exerts considerable influence on labour and delivery, with a mal-positioned fetus during active labor known to contribute towards fetal and maternal morbidity. The fetal occiput posterior position poses challenges in every aspect of intrapartum care.

In the present study, the feto-maternal outcome was observed in OP position at the onset of labor. Both study and control groups were comparable in respect to the distribution of age as the majority belonged the too early 20s. Most of the patients were of lower social, economic status, which could be explained by the fact that our hospital, being a rural tertiary care center and drains the poor people.

An association between malposition and multiparity was observed in our study. However, the difference was not statistically significant because of the less number of cases. Malposition is more frequent in multigravida because they have large fetuses with the lax abdominal wall.

The right OP position is 3–5 times more common due to more available space on right side due to dextrorotation of uterus and location of sigmoid colon on the left side. In the present study, 60% fetuses were in right OP position. This was in accordance to a study performed by Elie Nkwabong *et al.*[16] where out of 5.3% patients detected to have malposition, 3.4% had OP position. Different results were observed in a study conducted by A. Ahmad *et al.*[17] where lateral position was the most common.

In the study group, there is a prolongation of labor, and patients had a tendency of going into secondary uterine inertia. This observation suggests that malposition hinders the normal progress of labor as compared to OA position (p < 0.001). Similar findings had been reported by Fitzpatrick *et al.*[7]

The patients who had hypotonic contractions, the mode of augmentation of labor, was either by the surgical or medical method according to our standard operating protocol of the labor room. In the study by Yvonne *W.* Cheng *et al.*[18] augmentation of labor was done by use of oxytocin and artificial rupture of membranes. 4,039 patients were augmented by the use of oxytocin and 3,479 patients were augmented by artificial rupture of membrane. Elie Nkwabong *et al.*[16] showed that the vertex malposition had prolonged labor and require labor

stimulation. Labour augmentation was more common with vertex malposition.

Out of those who delivered vaginally, we analyzed the time taken in all stages of labor to find an association. The mean duration of the first stage of labor was 376.8 ± 1.26 minutes in the control group, whereas 473.2 ± 1.84 minutes in the study group. Similarly, the duration of the second stage of labor in the control group was 24.79 ± 9.77 minutes, whereas in that of the study group was 29.4 ± 7.67 minutes. The difference was statistically significant with a p-value of < 0.001 and 0.010 between the duration of first and second stage of labor in both the groups. This was because the OP group showed prolongation of both the stages in comparison with OA. In concordance of our results Gardberg M and Tupparainen M[19] found that the total length of labor was significantly longer in OP group. Neri *et al*.[20] suggested that the fetus delivered in OP position had prolonged second stage of labor with a reduction in spontaneous vaginal delivery. Elie Nkwabong *et al*.[16] also observed that labor was more prolonged in the vertex malposition group.

40% patients were subjected to a cesarean section in study group against 18% in the control group. It was due to non-progress of labor. i.e., arrest of descent, deep transverse arrest, and fetal distress in both the groups. It is one of the known facts that android pelvis is not favorable for long anterior rotation, which is why some patients land into deep transverse arrest.

Of these 50 patients of OP group, 21 (42%) patients had long anterior rotation and delivered as those of OA position, 4 (8%) delivered as face to pubis, 5 (10%) with ventouse application, and rest of 20 (40%) patients had a cesarean delivery. Instrumental delivery was comparable in both the groups in our study. But the cesarean section rate was significantly high. Our findings suggest that there should be clear demarcation and appropriate length of time before embarking on interventions for delayed progress of labor. *Wayu Abraham* and Yirfu Berhan *et al*.[21] observed that cesarean delivery was the most common type of intervention undertaken in OP position.

In our study, labor complications in form of post partum haemorrhage (PPH), cervical, vaginal, paraurethral, or perineal lacerations were found in both the groups. Control group had two patients (4%) of PPH against four patients (8%) in the study group, Maximum perineal tears were present with a study group i.e., 40% against 16% in the control group. The majority of patients had a vaginal tear, i.e., 20% in study group against 6% in control group. Our results are similar to Fitzpatrick *et al*.,[7] who demonstrated that the persistent OP group had a higher incidence of perineal lacerations and episiotomy than the control group. Ponkey *et al*.[22] suggested that OP position was associated with increased perineal trauma in the form of third and fourth-degree lacerations. Yvonne W Cheng *et al*.[18] demonstrated that maternal complications were increased with OP position at delivery as compared to OA position. We have found that the labor complications were comparable in both groups. But, it is not in concordance with other authors as we actively manage our patients according to a standard operative protocol (SOP) of our institute and we took an early decision for management of our patients.

In the present study, study group had six (12%), neonates, with Apgar score < 7 against eight (16%) neonates of control group. The mean Apgar score at 1-minute of delivery was 7.56 ± 1.4 and 7.74 ± 0.8 of control and study group, respectively. The mean Apgar score at 5 minute of delivery was 8.80 ± 0.70 and 8.84 ± 0.55 of control and study group, respectively. This was in difference with the observations by Senecal *et al*[23] who reported a difference in Apgar score at 5 minutes between OA and OP groups.

In this study, maternal morbidity in the form of PPH, perineal, cervical and vaginal tears is associated more with malposition i.e. occipito-posterior position. There is prolongation of first and second stage of labour too. Neonatal outcome and NICU admissions were also more with malposition but the difference between the two groups was statistically not significant.

CONCLUSION

Ultrasound was a reliable method for confirming the fetal position even in labor. First and second stage of labor are prolonged in OP position as compared to OAposition. The art of obstetrics is dying in the present scenario as no patient was subjected to manual rotation. Incidence of cesarean section was higher in cases of malposition. The study has its limitations because of the small sample size and for any recommendations to draw, a large randomized controlled trial is required.

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