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Original Research Article

Maternal and neonatal outcome in primigravida with mobile head at ≥39 weeks of gestation

Sadhanadevi C.[1], Sajini B.[1]*, Acka Priya Varghese[1], Divya Sara Raju[1], Karishma Krishna Kurup[2]

[1]Department of Obstetrics and Gynaecology, Government Medical College, Kottayam, Kerala, India
[2]Independent Public Health Consultant, Kerala, India

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***Correspondence:**
Dr. Sajini B.,
E-mail: drsajinibhama@gmail.com

ABSTRACT

Background: Primigravida with mobile head at ≥39 weeks of gestation are prone to the probability of caesarean section. With this study we aimed to identify the maternal and neonatal outcome of primigravida with mobile head at ≥39 weeks of gestation under the watchful expectancy and good conduct of labour.
Methods: A cross sectional study was conducted among primigravida with mobile head at ≥39 weeks admitted for delivery in the department of obstetrics and gynaecology, govt. medical college, Kottayam, Kerala, from February 2021 to September 2021. A sample size of 247 was identified considering 28% proportion of presentation with deflexed head, 95% confidence interval and 2% margin of error. A detailed history, physical examination and ultrasonography was performed.
Results: Of the 250 participants, the mean age of the study subjects was 24.97±3.93 and mean body mass index (BMI) was 23.72±4.78 kg/m^2. The most common cause for mobile head was a deflexed head (35.2%). A lower segment caesarean section (LSCS) was conducted in 28.8% participants while vacuum assistance ad forceps assistance was required for 9.6% and 4.4% participants respectively. The most common indication for LSCSC being moderate to thick meconium-stained amniotic fluid (MSAF) 23% followed by 1st degree CPD failed trial in 17% cases. A significant association with maternal morbidity was observed in undiagnosed placenta previa (p=0.039) and vacuum-assisted deliveries (p=0.001). We observed that 3.6% of babies have meconium aspiration syndrome, and 8% of new born were admitted in intensive care for foetal distress.
Conclusions: Primigravida with mobile head at term during labour requires intense monitoring. Although the duration of labour appeared to be prolonged in a small proportion of patients with watchful expectancy and good conduct of labour and timely intervention, vaginal delivery is possible with minimal maternal and neonatal morbidity.

Keywords: Primigravida, Labour, Non engaged head

INTRODUCTION

The degree of engagement of the foetal head is a parameter used in clinical obstetrics as a guide in evaluating and managing the labour.[1] Among primigravidas in labour, a high foetal station can threaten the progress of labour.[2] The high station of the foetal head at term in a primigravida is not a welcome finding and requires appropriate investigation. Possible aetiology includes feto-pelvic disproportion, cord around the neck, deflexed head or obstruction of the foetal passage by a tumour in the lower uterine segment or undetected placenta previa.[2] Traditional knowledge indicate foetal head engagement before the 38th week in primigravida, however this is seldom the case.[3] If the engagement occurs, it is evidence that the pelvic inlet is adequate for that foetal head however, this is not the case in most nulliparous women at the onset of labour.[4]

Another concern is the prolonged duration of the first and second stage of labour in primigravida with mobile head. Prolonged labour exposes the mother to a high risk of infection, dehydration, ketosis and obstructed labour while the foetus faces the danger of asphyxia, meconium aspiration and sepsis. This subsequent fear of complications from a prolonged labour has seen an increased indication for caesarean section. Studies reveal that primary caesarean section rates was significantly higher in unengaged group being 16.89 percentages when compared with 5.33 percentages in engaged group.[5] Reports reveal that the prevailing definition of labour arrest are built on traditional knowledge leading in intrapartum caesarean deliveries occurring much earlier than required hence recognising a need for further evaluation of the labour process to ensure positive maternal and foetal outcomes.[6]

Primigravida with mobile head at ≥39 weeks of gestation are prone for labour dystocia. With vigilant monitoring, the probability of caesarean section may be reduced. With this study we aimed to identify the maternal and neonatal outcome of primigravida with mobile head at ≥39 weeks of gestation under the watchful expectancy and good conduct of labour.

METHOD

A cross sectional study was conducted among primigravida with mobile head at ≥39 weeks admitted for delivery in the department of obstetrics and gynaecology, government medical college, Kottayam, Kerala, from February 2021 to September 2021. A sample size of 247 was calculated considering the 28 percentages proportion of presentation with deflexed head, 95 percentages confidence interval and 2% margin of error. The inclusion criteria were; an uncomplicated primigravida with mobile head at ≥39 weeks of gestation, vertex presentation, single live foetus and intact membranes. Primigravida who came under the following criteria; medical complications (like diabetes, hypertension, heart disease), skeletal deformity, history of previous uterine surgery or presenting with severe intra uterine growth retardation were excluded from the study. Approval was taken from the institutional research board and informed consent was taken from all enrolled participants as per the protocol agreed by the ethical committee as well as the institutional regulations also.

Data collection was done by taking a detailed history and participants were subjected to general physical examination and obstetric examination were; we assessed the symphysio-fundal height, fundal grip, lateral umbilical grip, first and second pelvis grip to access the status of the foetal head, attitude of the foetus and estimated foetal birth weight is calculated with Johnson's formula. (Johnson's formula for calculating estimated foetal birth weight is as follows foetal weight in gram=fundal height (cm) n×155 and n=12 if vertex is above ischial spine and n=11 if vertex is below ischial spine).

Ultrasound was performed to assess foetal biometry, AFI, placental localisation and EFBW. Vaginal examination was done to assess the consistency of the cervix, its effacement, dilatation in cm, station of foetal head, status of the membrane and adequacy of pelvis, and induction of labour based on the BISHOP score. Head was defined as 'engaged' when the foetal head crossed the station 0 (at the level of maternal ischial spines). The degree of cephalopelvic disproportion at the brim was ascertained by Munro-Kerr-Muller method. An admission cardiotocography was taken, the course and duration of the labour were plotted in a partograph.

The maternal outcome was monitored, by reviewing the time of head engagement, the duration of labour, engagement to delivery interval, augmentation with oxytocin, and the mode of delivery. The condition of the baby was assessed by the APGAR score at 1 minute and 5 minutes. The patients were followed up till their delivery to study the maternal and foetal outcome due to mobile head at ≥39 weeks of gestation. The probable aetiology of this condition was also noted in them.

All the data which was collected were coded and entered in Microsoft Excel sheet which was re-checked and analysed using SPSS statistical software version 22. Quantitative variables were summarised using mean and standard deviation (SD). Categorical variables were represented using frequency and percentage. Independent sample t test and ANOVA were used to test statistical significance of difference between means of variables among two independent groups. Pearson Chi-square test and Fisher's exact test were used for comparing categorical variables between groups. Pearson correlation test was done to find out significance between two quantitative variables. A $p<0.05$ was considered statistically significant.

RESULT

Two hundred fifty cases of primigravida with mobile head ≥39 weeks were recruited in this study after fulfilling the inclusion and exclusion criteria. The mean age of the study subjects was 24.97±3.93. The mean body mass index (BMI) of the study population was 23.72±4.78 kg/m2, with 10% falling in the underweight category, 42% were normal, 16% were overweight, 18 % were obese class 1 and 14 % were obese class 2.

The etiology of mobile head in primigravida at ≥39 weeks of gestation included deflexed head, CPD, loops of cord around the neck, polyhydramnios, undiagnosed placenta previa, lower uterine fibroid and idiopathic with the most common cause to be deflexed head in 88 (35.2%) participants.

Among the participants, 95 (38%) required induction of labour with either Foley's or PGE1 and 124 (49.6%) required oxytocin for augmentation of labour. Furthermore, 155 (62%) of participants presented with

spontaneous labour with 147 (57.2%) of them having a normal vaginal delivery. A LSCS was conducted in 72 (28.8%) participants while vacuum assistance ad forceps assistance was required for 24 (9.6%) and 11 (4.4%) participants respectively.

The mean duration of labour at the 1st stage of was 12.56±5.82 hours and at the 2nd stage was 59.79±46.10 minutes. Only 18.8% of primigravida had prolonged latent phase. However, 2.4% had secondary arrest of dilatation, 2% of primigravida had prolonged deceleration phase, and 2% primigravida had arrest of descent.

Among those who required an LSCS the most common indication was moderate to thick MSAF in 17 (23.6%) followed by 1st degree CPD 12 (16.7%), fetal distress 11 (15.3%), arrest of descent 9 (12.5%), arrest of dilatation 6 (8.3%), undiagnosed Placenta previa 5 (6.9%), failed induction 3 (4.2%) and deep transverse arrest 2 (2.8%).

In our study population 28% had maternal morbidity with 11.6% women having postpartum hemorrhage, 9.6% had perineal tears, 5.6% had wound infection and 2.8 % had cervical tear. Fetal distress was seen among 8.4% of study population. The mean APGAR score at 1 minute was 8.76±0.76 and at 5 minutes was 8.93±0.29. The mean birth weight of neonates was observed to be 3.03±0.39 kg. NICU admission was sought for 8%, further we observed meconium aspiration syndrome in 3.6% neonates of study population.

Our study shows a significant association was between undiagnosed cases of placenta previa (p=0.039) and vacuum assisted deliveries (p=0.001) with maternal morbidity in primigravida with mobile head at ≥39 weeks of gestation (Table 1).

We also observed a significant association between fetal distress with risk factors like loops of cord around the neck (p=0.038), LSCS (p=0.001), indication of LSCS for moderate to thick MSAF (p=0.007) (Table 2).

We observed from the correlation of outcome variables with APGAR at 1 minute, a positive correlation with birth weight and APGAR score at 5 min and a negative correlation with prolonged 2nd stage of labour (Table 3). A similar negative correlation for duration of 2nd stage of labour with APGAR at 5 min (Table 4).

Table 1: Association of maternal morbidity with other study variables.

Variables	Maternal morbidity		P value
	Present, (n=70) (%)	Absent, (n=180) (%)	
Age (Mean± SD) (Years)	25.17±4.12	24.89±3.86	0.611
BMI (Mean± SD)	23.65	23.74	0.893
Etiology of mobile head			
Deflexed head	26 (29.5)	62 (70.5)	0.786
CPD	12 (21.8)	43 (78.2)	0.634
Loops of cord	11 (36.7)	19 (63.3)	0.038
Undiagnosed placenta previa	6 (75)	2 (25)	0.039
Polyhydramnios	6 (28.6)	15 (71.4)	0.637
Lower uterine fibroid	2 (25)	6 (75)	0.845
Mode of delivery			
Normal vaginal	44 (30.8)	99 (69.2)	0.645
Forceps assisted	0	11 (100)	0.314
Vacuum assisted	13 (54.2)	11 (45.8)	0.632
LSCS	13 (18.1)	59 (81.9)	0.001*
Duration of labour			
Duration of labour in 1st stage (Mean ± SD)	12.27±5.89	12.67±5.81	0.431
Duration of labour in 2nd stage (Mean ± SD)	63.23±41.12	58.45±47.94	0.463
Indication for LSCS	**Required LSCS, (n=12)**	**Vaginal delivery, (n=60)**	**P value**
Arrest of dilatation	0	6 (100)	0.207
Arrest of descent	3 (33.3)	6 (66.7)	0.239
1st degree CPD	1 (8.3)	11 (91.7)	0.197
Fetal distress	2 (18.2)	9 (81.8)	0.191
Moderate to thick MSAF	2 (11.8)	15 (88.2)	0.007*
DTA	0	2 (100)	0.187
Failed induction	0	3 (100)	0.193
Placenta previa	3 (60)	2 (40)	0.287
2nd degree CPD	1 (20)	4 (80)	0.301
Cord prolapse	0	2 (100)	0.319

*Statistically significant

Table 2: Association of fetal distress with other outcome variables.

Variables	Fetal distress		P value
	Present, (n=21)	Absent, (n=229)	
Age (Mean ± SD) (Years)	26±4.68	24.87±3.85	0.210
BMI (Mean ± SD)	25.27±6.25	23.58±4.62	0.121
Etiology			
Deflexed head	3 (3.4)	85 (96.6)	0.159
CPD	8 (14.5)	47 (85.5)	0.151
Loops of cord	6 (20)	24 (80)	0.038*
Undiagnosed placenta previa	1 (12.5)	7 (87.5)	0.163
Polyhydramnios	1 (4.8)	20 (95.2)	0.176
Lower uterine fibroid	1 (12.5)	7 (87.5)	0.157
Mode of delivery			
Normal vaginal	1 (0.7)	142 (99.3)	0.396
Forceps assisted	1 (9.1)	10 (90.9)	0.513
Vacuum assisted	2 (8.3)	22 (91.7)	0.436
LSCS	17 (23.6)	55 (76.4)	<0.001*
Duration of labour in 1st stage			
Mean (hours)	10.90±5.50	12.71±5.84	0.175
Duration of labour in 2nd stage			
Mean (minutes)	24.76±26.38	63±46.22	<0.001*
Indication for LSCS	**N=17**	**N=55**	
Arrest of dilatation	0	6 (100)	0.10
Arrest of descent	0	9 (100)	0.132
1st degree CPD	1 (8.3)	11 (91.7)	0.213
Fetal distress	4 (36.4)	7 (63.6)	0.163
Moderate to thick MSAF	10 (58.8)	7 (41.2)	0.007*
DTA	0	2 (100)	0.139
Failed induction	0	3 (100)	0.121
Placenta previa	1(20)	4 (80)	0.146
2nd degree CPD	0	5 (100)	0.163
Cord prolapse	1 (50)	1 (50)	0.153
APGAR at 1 min			
Mean	6.62±0.66	8.95±0.36	<0.001*
APGAR at 5 min			
Mean	8.38±0.66	8.98±0.16	<0.001*
Birth weight			
Mean	2.92±0.50	3.04±0.38	0.204
Neonatal morbidity			
Present	17 (77.3)	5 (22.7)	<0.001*
Absent	4 (1.8)	224 (98.2)	

*Statistically significant

Table 3: Correlation of outcome variables with APGAR at 1 min.

Variables	Correlation coefficient (r)	P value
Age (Years)	-0.079	0.212
BMI	-0.053	0.404
Duration of labour in 1st stage	0.076	0.231
Duration of labour in 2nd stage	-0.233	<0.001*
APGAR at 5 min	0.764	<0.001*
Birth weight	0.127	0.045*

*Statistically significant

Table 4: Correlation of outcome variables with APGAR at 5 min.

Variables	Correlation coefficient (r)	P value
Age (Years)	-0.095	0.134
BMI	-0.047	0.462
Duration of labour in 1st stage	0.099	0.119
Duration of labour in 2nd stage	-0.203	0.001*
Birth weight	0.063	0.322

*Statistically significant

DISCUSSION

This study was conducted among 250 cases of primigravida with mobile head ≥39 weeks with the aim of identifying maternal and neonatal outcomes while allowing the patient with mobile head to deliver vaginally in the absence of obvious CPD under vigilant supervision, judicious use of oxytocin, continuous CTG and partograph monitoring in active phase of labour and /or rupture of membranes. Deflexed head was the most common cause of the high head station, this has been reported in other studies.[2] An important observation was the undiagnosed placenta previa and vacuum-assisted delivery which led to maternal morbidity.

Caesarean section is most commonly sought surgery in a primigravidae with unengaged head.[7] Studies report a higher risk for caesarean section among nulliparous women with a floating head when the progress of labour is perceived to be abnormal.[8] However our study shows that this does not have to be the case with continuous monitoring. Furthermore, the monitoring mechanism that was followed enabled LSCS to be an indication only 28% of participants. The efforts from continuous monitoring with similar outcomes has been previously documented and hence a mobile head station is not necessarily an indication for LSCS.[1]

Though a continuous monitoring mechanism was set in place, there are certain indications for which an LSCS is essentially indicated, possible maternal haemorrhage being one due to placenta previa being one of them. Recent studies suggest the incidence of placenta previa at 0.8% in Kerala.[9] While placenta previa has grave consequences reports suggest that there is still a delayed diagnosis for the same.[10] In our study we were able to identify undiagnosed patients with placenta previa hence indicating the need for LSCS.

The major limitation of our study was the inclusion of only primigravida uncomplicated pregnancies to assess the maternal and foetal outcome considering that a safe vaginal delivery was likely the possible modality that would be followed. Secondly, the pregnant mothers were not a part of the planning of the study and were only included when they presented to the labour ward, hence missing previous possible aetiologies that was responsible to the complications observed in the study. However, the results of the study hold merit and allows in providing sufficient information that can be utilised by the clinical workforce for the prospective planning of deliveries with pregnant mothers.

CONCLUSION

Primigravida with mobile at term during labour requires intense monitoring and suspicion. Although the duration of labour appeared to be prolonged in a small proportion of patients with watchful expectancy and good conduct of labour, timely intervention, judicious usage of oxytocin and plotting progressive labour on a partogarm, vaginal delivery is possible with minimal maternal and neonatal morbidity. Furthermore, the risk of placenta previa should be ruled out in such cases to prevent maternal morbidities. Hence, we conclude that caesarean section should not be the sole indication for primigravida with mobile head at the onset of labour.

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