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A prospective study of primigravida with unengaged head at onset of labour at term in the department of obstetrics & gynaecology, SMS Medical College, Jaipur

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Abstract

Objective: The study was conducted to determine the outcome of labour in the unengaged head at the onset of labour at term in primigravidas. The aim was to determine the course of labour in unengaged head in primigravida at the onset of labour and need of medical and surgical interventions and feto-maternal outcome.

Design: A Prospective hospital-based descriptive observational study.

Methods: In this prospective descriptive study, 110 primigravida with unengaged head at onset of labour at term (at 37-41weeks) who were admitted in labour room and satisfying inclusion and exclusion criteria were included. Detailed clinical history, physical examination and investigation are reported. The duration of stages of labour and total duration of labour and its partographic analysis, need for medical and surgical intervention, mode of delivery and fetomaternal outcome was recorded.

Results: In this study the mean age was 22.98 ± 3.28 years and maximum number of women belongs to 21-25 years age group. Maximum number of cases were between 39-40 weeks of gestational age with mean gestational age 39.09 ± 0.70 weeks. The mean maternal height was 156.44 ± 5.42 cm. Out of 110 cases free floating head was in 34.55%, vertex was at -3 ,-2 and -1 station in 33.64%, 25.45% and 6.36% respectively. 83.64% cases had spontaneous onset of labour. Induction and augmentation of labour required in 16.36% and 68.18% cases respectively. Mean duration of 1st, 2nd, 3rd stage of labour and total duration of labour was 12.79 ± 2.69 hours, 43.83 ± 26.05 minutes, 7.73 ± 2.71 minutes and 13.58 ± 2.79 hours. The mean duration of labor was more in higher fetal head station. In the present study 52.73%,14.54% and 32.73% women underwent normal vaginal delivery, instrumental vaginal delivery and LSCS respectively. Most common indication for LSCS was failure to progress (50%). Most common maternal complication was PPH and perineal tear each 5.45%. The mean APGAR score was 6.79 ± 0.84 at 1 minute and

8.69 ± 0.77 at 5 minutes. Mean birth weight was 3.02 ± 0.32 kg and 8.18% neonates were admitted in NICU for various indications.

Conclusion: Primigravida with unengaged head at onset of labour at term should be managed cautiously. By constant vigilance throughout the labour by partograph monitoring most of these women delivered vaginally with minimal feto-maternal morbidity. Constant extra watchful expectancy with appropriate means of intervention, especially in those appearing to be taking a protracted course is needful.

Keywords: Primigravida, Engaged, Unengaged, Lower segment caesarean section.

Introduction

Engagement is the initial cardinal movement of foetus in the mechanism of labour of a primigravida. As Ian Donald said, “primigravidae is a dark and untried horse”.[1] Certainly, many obstetricians take a pessimistic attitude toward eventual vaginal delivery if the head is not engaged by the onset of labour. One of the main reasons of this escalation is direct LSCS of primigravida with non-engaged fetal head at term, which is a frequently encountered finding in obstetric practice.[2] Thus, primigravida with unengaged fetal head at onset of labour may deliver vaginally if they are given fair trial of labor with watchful expectancy.

The purpose of the present study to analysed the progress of labor in primigravida with unengaged fetal head, to determine the role of active medical and surgical interventions and feto-maternal outcome.

Methodology

The present study was a prospective hospital-based descriptive study carried out on primigravida women with unengaged fetal head at onset of labour at term who was admitted in labour room. Institutional review board &ethical committee clearance was taken. Cases satisfying inclusion and exclusion criteria were included as 110 primigravida at term with unengaged (at 37-41weeks) head at onset of labour.

Inclusion Criteria

- Live singleton foetus
- Intact membranes
- Fetal weight between 2.5-4 kg
- Cervical dilation ≤ 3cm at the time of admission.
- Reactive CTG at term or at onset of labour.
- Women giving consent for participation in the study.

Exclusion Criteria

- Primigravida with medical complications like Diabetes mellitus and Hypertension.
- Contracted pelvis
- Congenital malformations of the foetus or soft tissue masses in pelvis such as uterine fibroids and ovarian tumors.
- Women with previous uterine surgery, severe IUGR (Intrauterine growth restriction) or any other skeletal deformity, placenta previa, Antepartum haemorrhage.

Detailed history regarding the parity, gestational age was taken. A general physical and systemic examination was done. The obstetrical examination was done for fundal height, lie, presentation, engagement, amount of liquor, estimated fetal weight, and fetal heart rate. Ultrasound was done to assess the expected date of delivery, with correlation to gestational age if needed, to exclude any intra-uterine growth restriction, fetal weight, placental site, amniotic fluid index, and to rule out any fetal anomalies.

The fetal head was unengaged if >2/5th of the fetal head was palpable on abdominal examination and/ or both poles of fetal head palpable by 2nd pelvic grip.

Pelvic assessment and bishop's score was done early in the labour. The Muller MunroKerr Maneuver was used to rule out cephalopelvic disproportion & diagonal conjugate to assess the adequacy of the pelvis. All relevant and routine investigations were noted.

Induction of labour with PGE2 gel(CP gel) was done based on bishop's score for cases where period of gestation was beyond 40 weeks. The course of labour was monitored by partograph. Oxytocin augmentation was started in women where uterine contraction was inadequate. The dose of oxytocin was titrated as per requirement. Artificial rupture of membranes was done when indicated. Emergency LSCS was performed in women for obstetrical indications.

All interventions - medical or surgical was recorded and documented. Progress of labour with duration of labour stages and total duration of labour , rate of cervical dilatation in active phase, duration of second stage, intrapartal foetal distress, mode of delivery whether spontaneous vaginal delivery, assisted vaginal delivery or LSCS and the indication of LSCS was documented. Active management of third stage of labor was done as per the protocols. Womens who delivered by caesarean section duration of labor was not taken into account. Weight of the newborns was measured and recorded.

Maternal complications in terms of postpartum haemorrhage, cervical tear, perineal tear was noted and managed actively. Neonatal outcome like APGAR score at 1st and 5th minute and NICU stay was noted.

Results

In this study the mean age was 22.98 ± 3.28 years and maximum number of women belongs to 21-25 yrs age group. Age group varied from 18-32 years which correspond to reproductive age group. Maximum number of cases were between 39-40 weeks of gestational age with mean gestational age 39.09 ± 0.70 weeks. Majority of the women height were between 156-160 cm. The mean maternal height was 156.44 ± 5.42 cm. The cases had free floating head in 34.55%women, vertex was at -3, -2 and -1 station in 33.64%, 25.45% and 6.36% women respectively. Maximum number of women had cervical dilatation 2 cm at the time of admission. 83.64% cases had spontaneous onset of labour. 16.36% cases needed induction of labour with PGE2 gel. Augmentation of labour required in 68.18% women. Mean duration of 1^{st} , 2^{nd}, 3^{rd} stage of labour and total duration of labour was 12.79 ± 2.69 hours, 43.83 ± 26.05 minutes, 7.73 ± 2.71 minutes and 13.58 ± 2.79 hours respectively.

The mean duration of first stage of labour according fetal station was 14.26±1.61hours for free floating, 13.99±1.51hours for -3 station, 11.37±2.96hours for -2 station and 09.63±2.41hours for -1 station while mean duration of second stage according fetal station was 51.12±34.52, 49.42±28.29, 36.46±15.91 and 30.71±08.38 minutes respectively and total duration of labour according to fetal station was 15.13±1.70, 14.85±1.58, 12.11±2.96 and10.13±2.51hours respectively. In higher fetal stations, the duration of labour was prolonged compared to lower stations. There was a highly significant difference noted in the duration of the first, second stage and the total duration of the labour (P=0.000).

Out of 110 cases, 52.73% women underwent normal vaginal delivery, 14.54% instrumental vaginal delivery and 32.73% underwent LSCS for various indication. In the present study most common indication for LSCS was failure to progress (50%), other indications were fetal distress (36.11%) followed by second stage arrest and DTA (11.11%) and least common indication was failure of induction. Most common maternal complication was PPH and perineal tear each 5.45% followed by cervical tear

(0.91%). APGAR score ≥7 was in 80% neonates and APGAR score <7 was in 20% neonates at 1 min. The APGAR score ≥7 was in 98.18% neonates and APGAR score <7 was in 1.82% neonates at 5 min. The mean APGAR score at 1 minute was 6.79 ± 0.84 and at 5 minute was 8.69 ± 0.77. The neonates with weight between 2.5-3 kg were 38.18% and between 3-4 kg were 61.82%. Mean birth weight was 3.02 ± 0.32 kg. 8.18% neonates were admitted in NICU for various indications. Out of 9 neonates, the commonest indication for NICU admission was hyperbilirubinemia in 44.44% neonates, followed by HIE changes and transient tachypnea of new born each 22.22% and least common meconium aspiration syndrome in 11.11% neonates.

Discussion

In the present study maximum number of women belongs to 21-25 yrs age group which was comparable to studies conducted by **Sirisha VS et al (2021)**[3] and **Goyal A et al (2019)**[4] and similar to our study mean age was 22.88 ± 2.702years and 24.40 ± 4.06 years respectively in above studies.

Similar observations showed by **Sirisha VS et al (2021)**[3], **Unnisa S et al (2019)**[5], **Pahwa S et al (2018)**[2] where maximum cases were in gestation age between 39 to 40 weeks.

Bhadra DM et al (2018)[6] showed that 83% cases had spontaneous onset of labour which comparable to our study. Similar observation showed by **Pahwa S et al (2018)**[2] that 86% unengaged women had spontaneous onset of labour.

Bhadra DM et al (2018)[6] showed that induction of labour required in 17%cases in unengaged head group. In study done by **Pahwa S et al (2018)**[2]**,**14% unengaged head cases required induction of labour. The observations were comparable to our study.

The result of our study was comparable to study done by **Sirisha VS et al (2021)**[3] in which augmentation was required 61% group B(UE). Similar study conducted by **Bhadra DM et al (2018)**[6] in which 73% women required augmentation in unengaged (UE) head group. According to **Pahwa S et al (2018)**[2] as augmentation were required in 72% cases in unengaged head. The observations were comparable to our study.

Sirisha VS et al (2021)[3]showed that mean duration of 1st and 2nd stage of labour were 12.98±3.72 hours and 27.65±9.24 minutes in group A(UE). Another study done by **Bhadra DM et al (2018)**[6] mean duration of 1st and 2nd stage of labour were 14.21 hours and 34.38 minutes in unengaged group. However, **Pahwa S et al (2018)**[2] showed that mean duration of 1st and 2nd stage of labour were 11.25 ± 2.35 hours and 61.67 ± 34.6 minutes in unengaged women. According to **Sudhir S et al (2016)**[7] duration of first stage of labour was 12.06+0.50 hours while the duration of second stage was 36.3+15.2 minutes which was similar to our study. According to **Sirisha VS et al (2021)**[3] total duration of labour was13.53 hours in unengaged group. The observations were comparable to our study.

Our observations were comparable to study conducted by **Sirisha VS et al (2021)**[3] ,in which mean duration of first stage of labour according to fetal station was 14.67±3.17 hours for free floating, 11.60±3.49hours for -3 and -2 stations and , 9.04±1.85hours was for -1 station while mean duration of second stage according fetal station was 30.03±9.14, 24.90±9.41, and 24.13±6.75 minutes respectively and total duration of labour according to fetal station was 14.82±2.60, 12.08±3.47, and 9.45±1.86 hours respectively. Even in the Unengaged fetal head, the first, second and total duration of labour was longer in higher stations i.e. free floating compared to -3, -2

compared to -1 station p value =0.000, statistically highly significant.

Similar results were showed by **Shivamurthy HM et al (2014)**[8] where the mean total duration of labour was 16.6 hours for free floating head, 16 hours for -3 station, 13.2 hours for -2 station, 12.9 hours for -1 station. **Pahwa S et al (2018)**[2] showed that mean total duration of labour was 13.30 hours in mobile head ,11.5 hours in -3 station, 9.7 hours in -2 station and 9.57 hours in -1 station. Similar to our study **Bibi S et al (2017)**[9] showed that mean total duration of labour was 12.20 hours in free floating head, 11.22 in -3 station, 10.31 in -2 station, 8.2 hours in -1 station.

In the present study 52.73% women underwent normal vaginal delivery, 14.54% instrumental vaginal delivery and 32.73% underwent LSCS. Similar study done by **Bhadra DM et al (2018)**[6] showed that in the unengaged head group 53% underwent normal vaginal delivery, 10% underwent instrumental vaginal delivery, and 37% underwent LSCS. In another study done by **Shivamurthy HM et al (2014)**[8] in the unengaged head group 69% underwent normal vaginal delivery, 14% underwent instrumental vaginal delivery, and 18% underwent LSCS. **Pahwa S et al (2018)**[2] showed that 56% cases delivered by caesarean section, 8% by instrumental delivery and remaining 36% women delivered by normal vaginal delivery. In this study, LSCS cases were higher comparative to our study in unengaged head group. In study done by **Unnisa S et al (2019)**[5] in which the 32%, 4% and 64% women were delivered by caesarean section, instrumental delivery and normal vaginal delivery respectively in unengaged fetal head. The observations were comparable to our study.

Similar to our study **Bhadra DM et al (2018)**[6] showed that most common indication for caesarean was failure to progress in 48.64% followed by fetal distress in 37.83% and failure of induction in 13.51% underwent LSCS for unengaged head group. According **Pahwa S et al (2018)**[2], the most common indication for LSCS in unengaged head was failure to progress which accounted for 44.64%. Other indications in their study were fetal distress in 39.3%, deep transverse arrest in 3.6%. In the similar study conducted by **Mahajan N et al (2016)**[10], 55.56% of cases with unengaged head went for LSCS for failure to progress, 37.03% for fetal distress and 7.41% for deep transverse arrest. **Sudhir S et al (2016)**[7] showed that 59.5% of unengaged head group went for LSCS due to failure to progress, 33.3% for fetal distress and 7.14% for other indications.

According to **Bhadra DM et al (2018)**[6], in unengaged group,11% patients had post-partum hemorrhage, 7% patients had perineal tear, 3% patients had cervical tear, 3% patients had wound infection. Similar observations were made by **El-Desouky ESA et al (2021)**[11] in unengaged heads the maternal complications included postpartum hemorrhage in 13 patients (8.6%), perineal and vaginal tears in 26 patients (17.3%), Shoulder dystocia in 2 patients (1.3%). **Mahajan N et al (2016)**[10], the most common maternal complication was PPH (10.67%) followed by wound infection (5.33%), perineal tear (3.33%), cervical tear and prolonged hospital stay 1.33% each. In study conducted by **Pahwa S et al (2018)**[2], PPH was seen in 19% cases, cervical tear in 4% and perineal tear in 1% cases. The observations are comparable to our study.

The observations were comparable to our study conducted by **Chaudhary S et al (2009)**[12] study, the mean APGAR at 1 minute was 7.66□0.66. **Bhadra DM et al (2018)**[6] showed that APGAR at 1st minute was >7 in 70% neonates and APGAR score was </=7 in 30%

cases in unengaged group. APGAR at 5 min was >7 in 92% neonates and </=7 in 8% neonates in unengaged group.

In our study the mean birth weight of the neonate in cases with free floating head was 3.06 kg, -3 station was 3.02kg, -2 station was 2.95kg, -1 station was 2.93kg. The results were comparable to **Sirisha VS et al (2021)**[3]. In comparison, the study conducted by **Pahwa S et al (2018)**[2], the mean neonatal birth weight at FF, -3, -2, -1 stations were 3.02kg, 2.88kg, 2.63,2.60kg respectively similar to our study.

In **Sirisha VS et al (2021)**[3], the mean neonatal birth weight was 3.03- 0.437kg in unengaged head group. According to **Chaudhary S et al (2009)**[12], mean birth weight was 3.23-0.39kg in unengaged head group. Dayal S et al (2014)13 observed that the mean birth weight was 2.77 kg in the unengaged group. Observations was very similar to present study.

Similar to our study **Sirisha VS et al (2021)**[3] showed that 7 babies from the unengaged head group were admitted to the NICU. The commonest indication for NICU admission was hyperbilirubinemia followed by mild respiratory distress in the group A(UE).

Conclusion

Unengaged head in primigravida at term causes apprehension in the minds of obstetrician and should managed cautiously with watchful expectancy and appropriate means of intervention throughout the labour by partograph monitoring. Most of primigravida with unengaged head at term may delivered vaginally with minimal feto-maternal morbidity. Proper trial of labour in primigravidas with unengaged head can reduced the rate of primary caesarean delivery, maternal morbidity and healthcare expenditure.

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