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Original Research Article

Obstetric outcome of floating head in primigravida at term

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ABSTRACT

Background: Engagement of head is the most important event in labor which decides obstetric outcome. Floating head in primigravida at term is considered an important obstetric risk factor. Cephalopelvic disproportion, occipitoposterior position and deflexed head should be suspected in most cases of floating head. Present study was conducted to determine the outcome of labor in primigravida with floating head at term. The primary objectives of the study was to analyse the progress of labor, need of medical and surgical interventions and fetomaternal outcome. The secondary objective was to find out the rate of caesarean section for floating head in all situations whether elective or emergency in labor.

Methods: This study was conducted in department of Obstetrics and Gynaecology SGRDIMS and R, Sri Amritsar on 100 primigravida subjects with floating head at term admitted through OPD admissions for induction of labor /spontaneous labor or referred from outside directly in early labor.

Results: In present study the mean age was 24.95 ± 3.01 years. The youngest case was 19 years old and eldest being 32 yrs old. The mean height was 151 ± 3.41 . At the time of admission 21% of cases had floating head, 55% cases were at -3 station, 17% of cases had -2 station, with only 7% of cases had -1 station. 56% of women delivered by caesarean section, 8% by forceps assisted vaginal delivery and 36% by normal vaginal delivery. The mean duration of labor was more in free floating and -3 stations in comparison to -2, or -1 stations. The need for augmentation was more in higher head stations. Mean birth weight was 2.84 ± 0.31 , it was more in higher fetal stations in comparison to lower fetal stations. No significant maternal and fetal morbidity was seen. There was no significant difference in the Mean APGAR score of higher head stations in comparison to lower fetal stations.

Conclusions: Primigravida with floating head at term and during labor should be managed cautiously. By proper monitoring and maintenance of partogram most of these cases deliver vaginally and without any maternal and fetal morbidity. The attitude of watchful expectancy and timely intervention will be used in all cases, especially in those appearing to be taking a protracted course.

Keywords: High Head at Term, Labor, Primigravida, Unengaged Head

INTRODUCTION

Labor is an important event, which is characterised by the onset of regular uterine contractions followed by progressive cervical dilatation, effacement and descent of presenting part.¹ In many multiparous and some nulliparous, fetal head is freely moveable above the pelvic inlet at the onset of labour which is referred as

floating head. Fetal head is said to be engaged when its biparietal diameter which is the widest diameter fits into the pelvic inlet.² It was traditional concept in obstetrics that engagement of fetal head occurs by 38 weeks of gestation in primigravida. In majority, engagement occurs between 38 and 42 weeks or even during the first stage of labor.³ As Ian Donald has said, "Primigravida is a dark and untried horse". This group is at risk of childbirth as

their capacity for child bearing has never been put to the test and their potential for child bearing is determined by the outcome of first labor.² Hence, if first pregnancy results in normal healthy child, patient is mentally better prepared for subsequent pregnancy. In the last two decades, the rising rate of LSCS is under critical review. One of the main reasons of this escalation is direct LSCS of primigravidas with non-engaged fetal head at term, which is a frequently encountered finding in obstetric practice.

Most of obstetricians take pessimistic attitude towards normal vaginal delivery, if fetal head is not engaged at the onset of labor because in an approximately 50% of primigravida, engagement of fetal head occur between 38-42 weeks, but in many primigravida engagement of fetal head occurs in an active stage of labor.⁴ These cases need fair normal vaginal delivery trial with partograph management of labor and timely interventions so that caesarean rates among these patients can be wisely reduced.³

Labor is generally prolonged with a high head so augmentation of labor is done to treat delayed labor when uterine contractions are assessed to be insufficiently strong or inappropriately coordinated to dilate the cervix.⁵ Aim is to shorten labor in order to prevent complications which may occur due to undue prolongation, and to avert caesarean section.^{6,7} Thus there is no significant increase in the incidence of fetal or maternal mortality and morbidity if it is judiciously managed. Thus, primigravida with unengaged fetal head at onset of labour may deliver vaginally if they are given fair trial of labor with watchful expectancy, there might be slight increase in the duration of labour but an unengaged fetal head in early labour should not by itself be an indication for early delivery by caesarean section.⁸

Aim of the study was to find out proportion of primigravida who underwent spontaneous engagement out of total with floating head at term and to study the maternal outcome of pregnancy with floating head and to optimise surgical intervention in order to minimise neonatal morbidity in terms of apgar score, meconium stained liquor and birth weight.

METHODS

This study was conducted in Department of Obstetrics and Gynaecology SGRDIMS and R, Sri Amritsar on 100 primigravida subjects with floating head at term admitted through OPD admissions for induction of labor /spontaneous labor or referred from outside directly in early labor.

Inclusion criteria

- Primigravida with floating head at term (37-41) weeks of gestation.
- Cephalic presentation

- Viable fetus
- Intact membranes

Exclusion criteria

- Multigravida
- Primigravida with medical complications like Diabetes mellitus and Hypertension etc or any other obstetrical complications.
- Contraindications for vaginal delivery such as placenta praevia, congenital malformations or any other space occupying lesions of the fetus.
- Fetal distress on admission.
- Patient with previous uterine surgery, severe IUGR (Intrauterine growth restriction) or any other skeletal deformity.

Detailed history specially, regarding the parity, gestational age and duration of pregnancy was recorded in the pre-decided questionnaire. General physical examination and systemic examination was done.

Obstetrical abdominal examination was done for fundal height, lie, presentation, engagement, amount of liquor, estimated fetal weight, palpable uterine contractions and fetal heart rate.

Ultrasound was done to assess the expected date of delivery, with correlation to gestational age, to exclude any intra-uterine growth restriction, fetal weight, placental site and amniotic fluid index and to rule out any fetal anomalies

Engagement of the head was defined on the basis of Second Pawlik's grip and Crichton's fifth's formula.

Vaginal examination was done for the assessment of Bishop's score.

Pelvic assessment was done by Muller Munro Kerr maneuver to check the adequacy of the pelvis. Diagonal conjugate was accurately measured to rule out any cephalo pelvic disproportion.

All relevant and routine investigations were sent.

Crichton's Trans-abdominal Method (Criteria for engagement)

- With the head 5/5 to 3/5 above the brim, the head was not engaged in the pelvis.
- At 2/5, 1/5 and 0/5 palpable, the head was engaged.⁹

Pawlik's grip

A gentle grip with thumb and fingers placed on the area over the symphysis pubis to determine what part of the fetal head was lying over the pelvic inlet and the amount of that presenting part that was palpable abdominally. If

head was not engaged then it could be easily grasped and moved from side to side.

Induction of labor was done with Tablet Misoprostol (given per vaginally) on the basis of bishop's score, who so ever required. Oxytocin was used to augment the patients in need. The dose of oxytocin was titrated as per requirement. Fetal heart rate was monitored as per protocol. In few cases artificial rupture of membranes was done to augment the labour and to rule out meconium staining of liquor. All interventions - medical or surgical were recorded and documented.

Non progress of labor

It was defined when the cervical dilation was less than 1cm/hr or there was no cervical dilation in period of two hour or there was no cervical descent in period of one hour or rate of descent was less than 1cm/hr, or, this was taken into account once the patient entered the active phase of labor (cervical dilation of atleast 3 cm). Non progress was defined when there was no change in the head position, or when head position initially changed but further progress halted.

Maternal complications in terms of Post partum haemorrhage, cervical tear, perineal tear was noted and managed actively. Weight of all the newborns was measured and recorded, APGAR scoring was done at 1min and 5 min. Partographic recording was done, and once the patients graph crossed the action line then immediate intervention in form of instrumental delivery or caesarean section was done as per the requirement. Total duration of each stage of labor was recorded and mean duration of labor was calculated but duration of labor in patients who delivered by caesarean section was not taken into account. Active management of third stage of labor was done as per the protocols.

RESULTS

This study was conducted on the 100 primigravida subjects fulfilling the above mentioned criteria. Out of 100 primigravida women, 38% of women in an age group of (26-30) yrs, 34 % in age group of (23-25Yrs), with minimum age of 19 yrs and maximum age of 32 yrs (Table 1).

Table 1: Distribution of cases according to age group.

| Age group (years) | No. of cases |
|-------------------|--------------|
| 19-22 | 23 |
| 23-25 | 34 |
| 26-30 | 38 |
| >30 | 5 |
| Total | 100 |

Distribution of cases according the gestational age (weeks) with 61% at 40 weeks, 23% at 39 weeks, 9% at

38 weeks, 5 % at 41 weeks and 2 % at 37 weeks of gestation (Table 2).

Table 2: Distribution of cases according to the gestational age at the time of admission.

| Gestational age (weeks) | No. of cases |
|-------------------------|--------------|
| 37 | 2 |
| 38 | 9 |
| 39 | 23 |
| 40 | 61 |
| 41 | 5 |
| Total cases | 100 |

Regarding the distribution of cases according the station of fetal head at the time of admission, with 55% at -3 station, 21% free floating head, 17% at -2 station and only 7% at -1 station (Table 3).

Table 3: Distribution of cases according to station of fetal head at the time of admission.

| Station of fetal head at the time of admission | No. of cases |
|--|--------------|
| Free floating | 21 |
| -3 | 55 |
| -2 | 17 |
| -1 | 7 |
| Total | 100 |

Distribution of cases according to the mode of delivery with caesarean section in 56%, normal vaginal delivery in 36% and forceps assisted vaginal delivery in 8% (Table 4).

Table 4: Distribution of cases according to the mode of delivery.

| Mode of delivery | No. of cases |
|-----------------------------------|--------------|
| Cesarean section | 56 |
| Forceps assisted vaginal delivery | 8 |
| Normal vaginal delivery | 36 |
| Total | 100 |

Out of 100 cases, in 86% of cases there was spontaneous onset of labor, while induction was done in 14% of cases with prostaglandins. 93.2% (69) cases spontaneous engaged occurred (Table 5).

Table 5: Induction of labor and outcome.

| Onset of labor | Outcome in terms of engagement of fetal head | | |
|-------------------------------|--|------------|-------|
| | Engagement | Unengaged | Total |
| Spontaneous onset of labor | 69 (93.2%) | 17 (6.75%) | 86 |
| Induction with prostaglandins | 5 (6.75%) | 9 (34.6%) | 14 |

Outcome of labor in terms station of fetal head, with 85.7% (18) of women with floating head underwent caesarean section, while 63.6% (35) of women in -3

station delivered by forceps assisted vaginal delivery and maximum number of cases with station -1 and -2 delivered by normal vaginal delivery (Table 6).

Table 6: Mode of delivery according to the station of fetal head at the time of admission.

| Station of fetal head at the time of admission | Mode of delivery | | | | | | Total |
|--|--------------------------------|------|---|-------|-------------------------|------|-------|
| | Normal vaginal delivery (n-36) | | Forceps assisted vaginal delivery (n-8) | | Cesarean section (n-56) | | |
| | (n) | % | (n) | % | (n) | % | |
| Free floating | 0 | 0 | 3 | 14.28 | 18 | 85.7 | 21 |
| -3 | 15 | 27.3 | 5 | 9.1 | 35 | 63.6 | 55 |
| -2 | 15 | 88.2 | 0 | 0 | 2 | 11.1 | 17 |
| -1 | 6 | 85.7 | 0 | 0 | 1 | 14.3 | 7 |
| Total | 36 | | 8 | | 56 | | 100 |

X² = 55.67; df =8; p <0.001; highly significant

Table 7: Distribution of cases according to indications of caesarean section

| Station of head at the time of admission | Indication of LSCS V/S station of head during labor | | | | P value |
|--|---|------------|-----------|-------------|---------|
| | DTA (n-2) | FD (n-22) | FOI (n-7) | NPOL (n-25) | |
| Free floating | 1 (4.8%) | 5 (23.8%) | 2 (9.5%) | 10 (47.6%) | <0.001 |
| -3 | 1 (1.8%) | 14 (25.5%) | 5 (9.1%) | 14 (25.5%) | |
| -2 | 0 | 2 (11.8%) | 0 | 1 (5.9%) | |
| -1 | 0 | 1 (14.3%) | 0 | 0 | |
| Total | 2 | 22 | 7 | 25 | |

Maximum number of caesareans were in view of Non-Progress of labor (25%), Fetal distress in 22%, Deep transverse arrest in 2% and Failed induction of labor in 7% (Table 7).

Table 8: Outcome of vaginal delivery (Mean duration of labor).

| Station of head on admission | Duration of first stage (hours) | Duration of second stage (minutes) | Total duration (hours) |
|------------------------------|---------------------------------|------------------------------------|------------------------|
| Free floating | 12.77 | 105 | 13.30 |
| -3 | 11.80 | 63.96 | 11.50 |
| -2 | 9.58 | 37.14 | 9.70 |
| -1 | 8.90 | 37.50 | 9.57 |
| P value | <0.001** | <0.001** | <0.001** |

Mean duration of labor in free floating head was 13 hours, 11.5 hours in -3 stations, 9.7 hours in -2 station and 9.5 hours in -1 stations (Table 8).

Maternal outcome in terms of Third degree perineal tear was seen in 1 cases, 4 cases of cervical tear and 19 cases of postpartum haemorrhage (Table 9).

Mean birth weight at station of free floating head was 3.02±0.26kg, -3 station was 2.87±0.28kg, -2 station was 2.63±0.29 kg and -1 station was 2.6±0.30kg (Table 10)

Table 9: Maternal complications in relation to station of fetal head.

| Complications | Station of fetal head on admission | | | | Total |
|----------------------------|------------------------------------|----|----|----|-------|
| | Free floating | -3 | -2 | -1 | |
| Third degree perineal tear | 0 | 1 | 0 | 0 | 1 |
| Cervical tear | 1 | 3 | 0 | 0 | 4 |
| Post-partum haemorrhage | 7 | 9 | 2 | 1 | 19 |

Table 10: Mean birth weight in relation to station of fetal head.

| station of fetal head on admission | mean birth weight | | p value |
|------------------------------------|-------------------|------|---|
| | mean birth weight | ±SD | |
| free floating | 3.02 | 0.26 | f = 12.512; p < 0.001; highly significant |
| -3 | 2.88 | 0.28 | |
| -2 | 2.63 | 0.29 | |
| -1 | 2.60 | 0.30 | |

Mean APGAR SCORE at 5 mins was 7.11±0.85. Neonatal morbidity in terms of NICU Admissions in 18, Neonatal intubation in 2, Meconium Aspiration in 1 and

no perinatal mortality was seen in first 7 days of life (Table 11,12).

Table 11: Mean APGAR score in relation to station of fetal head.

| Station of fetal head | N | APGAR score | | P value |
|-----------------------|----|-------------|------|-------------|
| | | Mean | ± SD | |
| Free floating | 21 | 6.81 | 0.93 | F = 1.554; |
| -3 | 55 | 7.13 | 0.82 | P = 0.221 |
| -2 | 17 | 7.29 | 0.85 | not |
| -1 | 7 | 7.43 | 0.79 | significant |

Table 12: Neonatal morbidity.

| Neonatal morbidity | Total |
|---|-------|
| NICU admissions | 18 |
| Neonatal intubation | 2 |
| Meconium aspiration | 1 |
| Perinatal mortality in first 7 days of life | 0 |

DISCUSSION

The present study was conducted in Department of Obstetrics and Gynaecology at SGRDIMSR Amritsar on 100 primigravida subjects with floating head at term admitted through OPD admissions for induction of labor or in spontaneous labor or referred from outside directly in early labor.

The mean age in the present study was 24.95±3.01 years. The youngest case was 19 years old and eldest being 32 yrs old. In a study conducted by Assadi et al the mean age was 24.59±1.21 years and Islam JA et al the mean age was 24±5.41 years.^{10,11}

The mean height in present study was 151±3.41 this was in an accordance with a study conducted by Chaudhary et al where mean height was 152±3.09. There was no statistically significant co-relation of (stature) height of the cases in relation to the station of fetal head.¹²

86% of women presented with spontaneous labor and induction was done with prostaglandins in 14% of cases. Among the induced cases head remained unengaged in 9(64%) cases and only 5(36%) cases head was engaged.

According to a study conducted by Shaikh F et al (2014), the single important predictor of engagement of fetal head was the natural onset of labor. Similarly, in present study significant relationship of engagement was seen in women who presented with spontaneous onset of labor in comparison to the those in which labor was induced artificially.¹³

In present study mean duration of labor in free floating head and -3 station was higher as compared to lower head station and similar results were seen in the studies conducted by Kaur et al and Mahendra G et al and this

relationship was found to be statistically significant.^{14,15} Nassery et al and Shivamurthy HM et al in their studies also concluded that higher the station of fetal head lesser was the chance of normal delivery (Table 13).^{16,17}

Table 13: Comparison of duration of labor with other studies.

| Study | Mean duration of labor | |
|-------------------|-----------------------------|------------------------------|
| | 1 st stage (hrs) | 2 nd stage (mins) |
| Debby A et al | 6.3±2.8 | 65.3±27.1 |
| Chaudhary S et al | 11.04±2.04 | 37.8±20.3 |
| Present study | 11.25 ±2.35 | 61.67± 34.6 |

In present study caesarean was done in 56% of cases, with maximum number of caesarean sections were performed due to non-progress of labor in 25 cases (44.6%). Compared with the studies conducted by Mahendra G et al, Chaudhary et al, the most common indication was non-progress of labor.^{15,12}

In present study Mean birth weight in a subject of free floating head was 3.023±0.262, -3 stations were 2.87±0.286, -2 station was 2.635±0.299 and -1 station was 2.6±0.35. These results were in consistent with other studies performed by Dayal S et al and Noura S EL Nassery et al the mean birth weight in engaged group was less in comparison to unengaged group.^{16,18}

In present study there was no significant difference in mean APGAR score of neonates with higher fetal station in comparison to the lower fetal station and same results were seen in studies conducted by Shaikh F et al and Neha Mahajan et al.^{13,19}

In present study labor was generally prolonged in those women who entered the labor with higher head station but there was no significant neonatal morbidity in cases who underwent vaginal delivery. Similar results were seen in the studies conducted by Shaikh F et al and Neha Mahajan et al but one perinatal mortality of neonate delivered by forceps who died 5 days after birth due to meconium aspiration was seen in the study of Neha Mahajan et al.¹⁹

CONCLUSION

By analysing the results, we can imply that primigravida with unengaged fetal head at onset of labor may deliver vaginally with minimal maternal and fetal morbidity, if they are given trial of labor with watchful expectancy specially in those cases in which no significant etiological factor is found by plotting a progressive labor on a partogram with timely interventions.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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