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Outcome of High Foetal Station in Primigravida With Vertex Presentation at Term - A Clinical Study in a Tertiary Care Center

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Abstract

Introduction: There is an uncertain relationship between foetal station and mode of delivery. The rise in the rates of caesarean section in unengaged head in primigravida is due to the reason that high foetal station which is considered as a threat to normal progress of labor and so immediately considered as an indication to early caesarean section. A vigilant attitude and timely intervention can help in decreasing chances of C-section and help such cases deliver vaginally. **Aims and Objectives**: To study the outcome of unengaged head in full term primigravida in labor. 1. To evaluate the causes of unengaged head and analyse progress of labour. 2. To assess maternal and foetal outcome. **Material and Methods:** 124 Primigravidae at term with unengaged foetal head in labor were undertaken in the study after they met eligibility criteria. After history taking and clinical examination, course of their labor was monitored partographically to study the maternal and neonatal outcome. **Results**: Out of 124 patients, 84 (67.74%) patients had vaginal delivery while in 40 (32.26%) Lower Segment Caesarean Section (LSCS) was performed. Out of 84 vaginal deliveries, 64 patients had full term normal deliveries while 20 patients needed assisted instrumental deliveries. Thus, out of 124 deliveries, 64 (51.61%) had normal vaginal deliveries, 20 (16.12%) instrumental deliveries and 40 (32.25%) Caesarean sections. **Conclusion**: We can imply that primigravida at term with high foetal station with spontaneous onset of labor are not all for immediate caesarean section. Watchful expectancy, vigilant intrapartum partographic monitoring can result into normal vaginal delivery with minimal maternal and foetal complications.

Keywords: Full Term, In Labour, Primigravida, Unengaged Head

1. Introduction

The series of events that take place in the genital organs in an effort to expel the viable products of conception out of the womb through the vagina into the outer world is called Labor[1]. Labor involves the onset of regular uterine contractions followed by progressive cervical dilatation, effacement and descent of presenting part[2]. Engagement of the foetal head is an initial stage in the mechanism of labor. Descent of foetal biparietal diameter and its passage through the pelvic brim is termed as "engagement"[3]. Checking for the engagement of foetal head forms the cardinal part of clinical examination of a full-term pregnancy. According to traditional concepts in Obstetrics, head engagement is believed to occur by 37-38 weeks of gestation in primigravida[4]. However, in majority, engagement occurs between 38-42 weeks and even during first stage of labor[4]. Hence, unengaged head in primigravida at term in labour is alarming.

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The known aetiologies behind unengaged foetal head are deflexed head, cephalopelvic disproportion, placenta previa, cord around neck, premature rupture of membranes etc.[1] The results of a study conducted at Holy Cross Hospital, Kottiyam, Kerala showed that 30% of the cases accounted for deflexed head, 20% for CPD but the commonest was of unknown aetiology (40%)[4]. Irrespective of the aetiology, non-engagement even until onset of labor reduces chance of safe vaginal delivery and produces a risk of surgical intervention (caesarean section), instrumental delivery or prolonged labor[5].

Previous studies[6–9] state that there is rise in the rate of LSCS and assisted vaginal delivery. However still, the rate of normal vaginal delivery remains higher. Hence, relation between foetal station and mode of delivery is still controversial. The escalation in the rates of LSCS in unengaged head in primigravida is due to the reason that an unengaged head is immediately considered as an indication to early caesarean section. However, a vigilant attitude and timely intervention especially for cases where no aetiology could be found, can help in decreasing chances of C-section and help such cases deliver vaginally.

2. Aim and Objectives

2.1 Aim

To study the outcome of unengaged head in full term primigravida inlabor.

2.2 Objectives

1. To evaluate the causes of unengaged head in full term primigravida in labor.
2. To analyse the progress of labor in primigravida in relation to station of foetal head
3. To assess maternal outcome of unengaged head in full-term primigravida
4. To assess neonatal outcome of unengaged head in full-term primigravida

3. Materials and Methods

1. Study design: This is an observational, cross-sectional study.
2. Study settings: The study was conducted at a medical college and tertiary healthcare centre after written informed consent from patients and ethics committee approval
3. Study duration: January 2018 to December 2019
4. Sample size: A total of 124 cases were studied after they met the inclusion and exclusion criteria.

3.1 Inclusion Criteria

1. Full term gestation (37-42 weeks)
2. Primigravida with unengaged head at onset of labor
3. Live singleton foetus
4. Vertex presentation
5. Intact membranes
6. Cervix less than 3 cm

3.2 Exclusion Criteria

1. Primigravida with medical complications like diabetes mellitus and hypertension
2. Malpresentation
3. Preterm pregnancy or intrauterine foetal growth restriction
4. Placental abnormalities like Placenta Previa, Abruptio Placenta
5. Contracted Pelvis

Primigravida in latent labor consenting for study participation were taken. Clinical history and general and systemic examination were recorded. Any comorbidities or obstetric complications were ruled out.

Height was recorded in centimeter; age in years and gestational age in weeks according to patients last menstrual period with good dates. Gestational age was confirmed by Ultrasonography (USG) and clinical examination.

Per abdominal examination was done for fundal height, foetal position and presentation, uterine contractions and unengaged foetal head. Floating head was confirmed by First Pawlik's grip[1] and Chrichton's Fifth's Formula[1]. The amount of head felt suprapubically in finger breadth is assessed by placing the radial margin of the index figure above the symphysis pubis until the groove of the neck is reached. Engagement was defined at less than 2/5th palpable. Per vaginal examination gave a confirmation about the head station in the pelvis.

Patients were monitored in active phase of labor with the help of a partogram. As the partogram crossed the action

line, immediate intervention in the form of augmentation of labor by Oxytocin, instrumental delivery or caesarean section was done. Oxytocin augmentation and artificial rupture of membranes were used to accelerate the process of labor. Presence or absence of thin/ thick meconium was recorded in order to keep a watch on foetal distress. Non progress of labor was defined as cervical dilatation less than 1cm/hr or no cervical dilatation in period of two hour , this was considered once the patient entered the active phase of labor (cervical dilatation of at least 4 cm according to ACOG). Non descent was defined when there was no change in the head position, or when head position initially changed but further progress halted.

Instrumental deliveries were carried out whenever indicated. Maternal complications were noted in terms of perineal tear, cervical tear and post-partum haemorrhage.

APGAR score was recorded immediately on birth and then at 5 minutes of life. Neonatal mortality was determined within first seven days of birth.

4. Results

The present study was conducted in the Department of Obstetrics and Gynaecology at a tertiary healthcare centre. We studied 124 Primigravida patients with full term pregnancy with high foetal station in labor.

We evaluated the relationship of foetal head station with at the onset of labor with progress and outcome of labor. Maternal and foetal outcome in this regard was studied.

The age range of the study population was between 18 years to 31 years. Maximum number of patients i.e. 79 out of 124 patients in the study were in the age group of 21-25

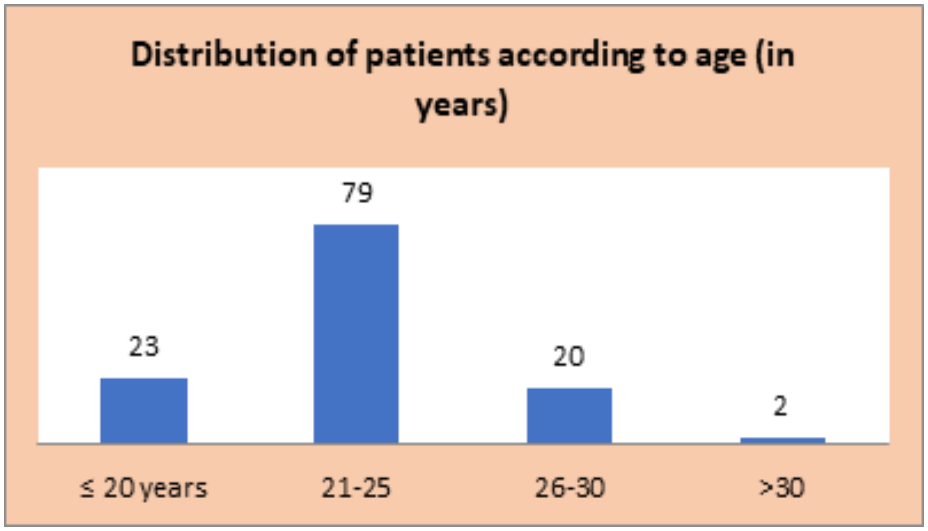

Chart 1. Distribution of skin diseases according to age group.

Table 1. Distribution of patients according to mode of delivery

Mode of delivery (n = 124)		
Vaginal (n = 84)		LSCS (n = 40)
FTND	Instrumental	
64 (51.61%)	20 (16.12%)	40 (32.25%)

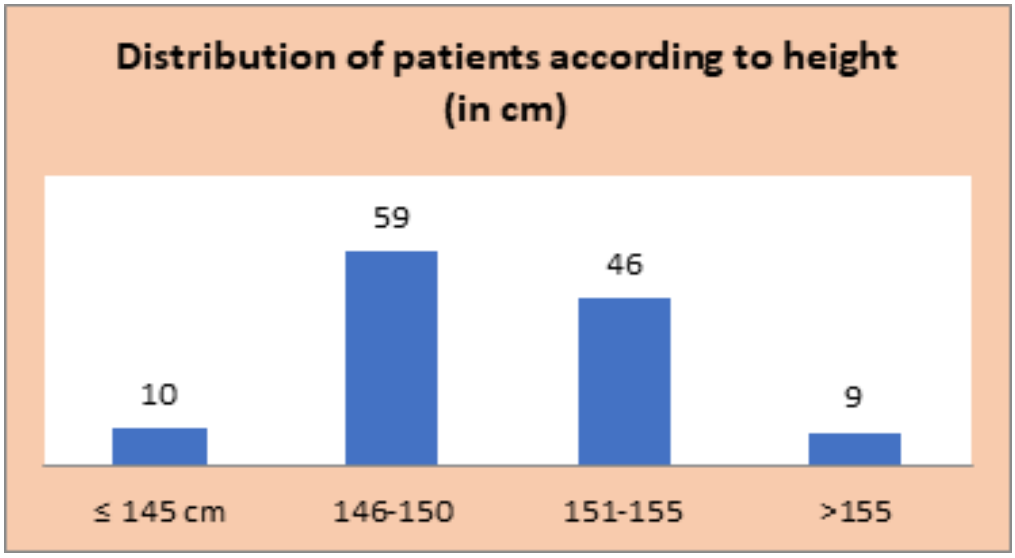

Chart 2. Distribution of patients according to height (in centimetre).

years (63.70%). The mean age in the study was 23.31±2.87 years. (Chart 1)

The height of the study population was between 140 cm to 168 cm. Most of the patients (59) (47.6%) were in the height range of 146 - 150 cm. The mean height in the present study was 150.76±3.91 cm. (Chart 2)

The mode of delivery in the present study was divided into Vaginal delivery and Caesarean section. Total vaginal deliveries were 84 (67.74%) while 40 (32.26%) LSCS were performed. Out of 84 vaginal deliveries, 64 patients had full term normal deliveries while 20 patients needed assisted instrumental deliveries. Thus, out of 124 deliveries, 64 (51.61%) normal vaginal deliveries,

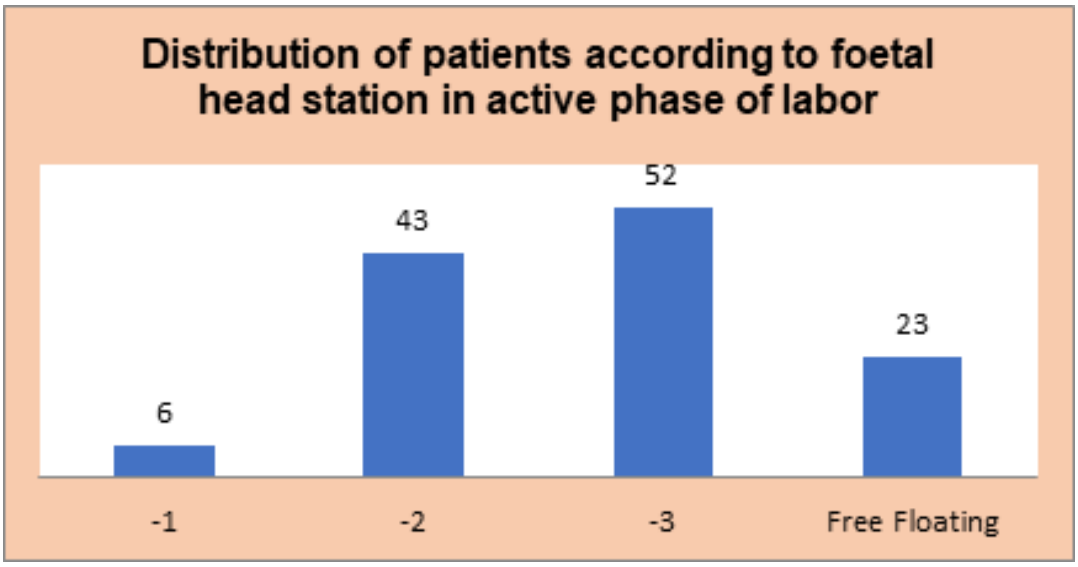

Chart 3. Distribution of patients according to foetal head station in active labour.

20 (16.12%) instrumental deliveries and 40 (32.25%) Caesarean sections. (Table 1)

In active phase of labor, 23 (18.5%) patients presented with unengaged foetal head, 52 (41.9%) had head station at -3, 43 (34.7%) had foetal station at -2 and 6 patients (4.8%) had head station at -1. (Chart 3)

In active phase of labor, out of 124 patients, 23 patients had free floating foetal head, 52 patients had head station at -3, 43 patients at head station -2 and 6 patients at -1. Out of the 23 patients with free floating head, 7 underwent normal vaginal delivery, 2 had instrumental delivery while 14 had to undergo Caesarean section. All the 6 patients with head station at -1 underwent normal vaginal delivery. This association of foetal head station with mode of delivery is statistically significant with a p value of <0.0001. (Table 2)

40 out of 124 patients from the study population underwent caesarean section giving a rate of 32.25%.

Table 2. Association of Fetal Head station with Mode of Delivery

Head Station	Mode of Delivery				P-value
	FTND	Instrumental	LSCS	Total	
-1	06 (9.4%)	00	00	06	P<0.0001 Statistically significant
-2	31(48.4%)	04(20.0%)	08(20.0%)	43	
-3	20(31.2%)	14(70.0%)	18(45.0%)	52	
Free Floating	07(10.9%)	02(10.0%)	14(35.0%)	23	
Total	64(100%)	20(100%)	40(100%)	124	

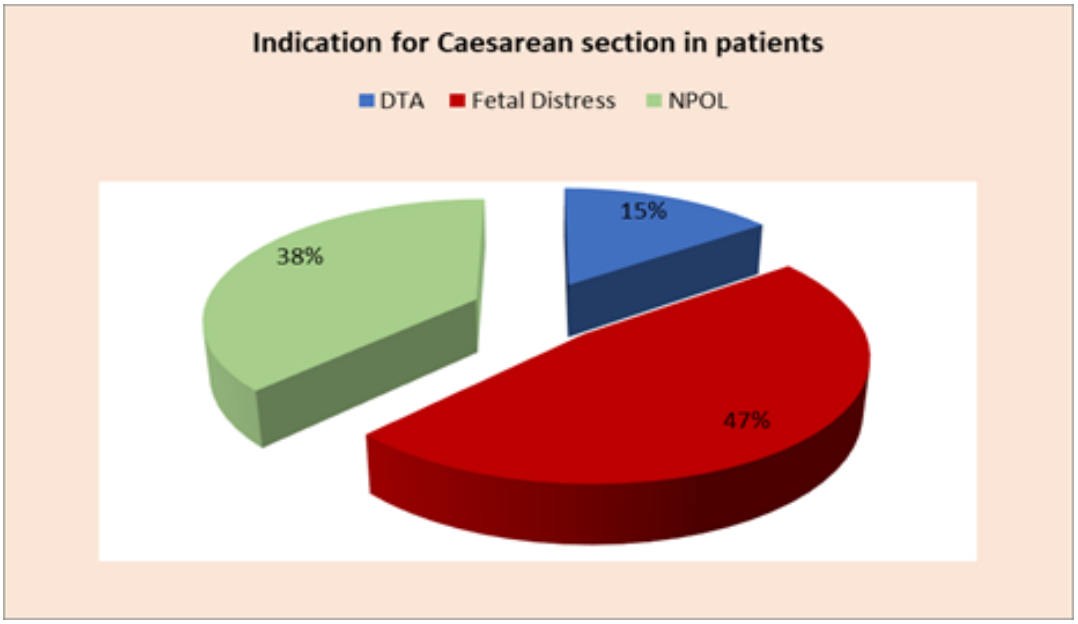

Chart 4. Indication for Caesarean section.

Table 3. Association of Mean Total duration of labor in hours with Head station

Head stations	Mean±SD	95 % CI		P-value
		Lower	Upper	
-1	7.84±0.72	7.08	8.60	P<0.0001 Statistically significant
-2	9.40±3.10	8.33	10.46	
-3	11.40±2.93	10.39	12.41	
Free Floating	13.22±3.07	10.85	15.59	
Total	10.52±3.23	9.82	11.22	

Table 4. Comparison of Mean birth weight with Head Station

Head stations	Mean±SD (KG)	95 % CI		P-value
		Lower	Upper	
-1	2.88±0.29	2.56	3.19	P=0.043 Statistically significant
-2	2.78±0.26	2.70	2.86	
-3	2.82±0.35	2.72	2.92	
Free Floating	3.01±0.37	2.85	3.17	
Total	2.84±0.33	2.79	2.90	

Foetal distress found in 19 patients (47.5%) was a major indication for caesarean section. This was followed by non progress of labor with 15 patients (37.5%), least being deep transverse arrest with 6 patients (15%). (Chart 4)

For the present study, mean duration of first stage of labor was 9.79±2.84 hours and that for second stage of labor was 43.85±27.89 minutes. The mean total duration of labor is lowest i.e.7.84±0.72 hours for a head station at -1 in active phase of labor. Whereas the duration is highest i.e. 13.22±3.07 hours with an unengaged head in active phase of labor. This association is statistically significant. (Table 3).

In our study, the mean birth weight of babies with head station at -1 in active phase of labor is 2.88±0.29 kg, at -2 station is 2.78±0.26 kg, at -3 station is 2.82±0.35 kg and those for free floating head in active phase is 3.01±0.37 kg. This comparison of foetal head station with mean birth weight was statistically significant with a p value of 0.043. (Table 4)

In our study, maternal complications were studied in association with foetal head station under 3 headings: Postpartum Haemorrhage, Cervical tear and Perineal tear. 4 patients with head station free floating, 11 with head station at -3 and 5 with station at -2 suffered from postpartum haemorrhage. In total, 20 patients had

Table 5. Maternal morbidity

Head stations	PPH		Cervical tear		Perineal tear	
	Positive	Negative	Positive	Negative	Positive	Negative
-1	00	06	00	06	00	6
-2	05	37	02	40	01	41
-3	11	41	02	50	03	49
Free Floating	04	19	00	23	01	22
Total	20 (16.12%)	103	04 (3.21%)	119	05 (4.03%)	118

postpartum haemorrhage. While only 4 patients had cervical tear 2 at -2 and -3 station each. 5 patients had perineal tear, 3 at station -3 while 1 at -2 and free floating each. (Table 5)

Table 6. Comparison of Mean 5 Minute APGAR Score with Head station

Head stations	Mean±SD
-1	7.44±1.07
-2	7.49±1.08
-3	7.44±1.07
Free Floating	7.48±0.95
Total	7.41±1.05

In the study, the total mean 5-minutes APGAR score was 7.41±1.05. The mean APGAR score for patients with station at -1 was 7.44±1.07, for those at station -2 was 7.49±1.08, for those at station -3 was 7.44±1.07 and those with a free-floating head was 7.48±0.95.

5. Discussion

The age range of the study population was between 18 years to 31 years. Maximum number of patients i.e. 79 out of 124 patients in the study were in the age group of 21-25 years (63.70%). In a study by Unnisa *et al.* (2019), maximum patients i.e. 66.66% patients belonged to the age group of 21-25 years[10]. Similarly, in a study by Arunarekha *et al.* (2018), 69% patients belonged to that age group[11].

The mean height in centimetre in the present study was 150.76±3.91 cm. which is comparable to the mean height of 152.7±3.09 of the study by Chaudhary *et al.* (2009)[12].

In the present study, total vaginal deliveries were 84 (67.74%) while 40 (32.26%) LSCS were performed. In a study by N Khurshid and F Sadiq (2012) in Lahore they found that vaginal delivery occurred in 67% of cases, and 33% of cases had caesarean section[7]. Also, in a study by Ambwani *et al.* (2003), vaginal delivery was seen in 66% of cases and LSCS in 34% of cases[4].

In active phase of labor, 23 (18.5%) patients presented with unengaged foetal head, 52 (41.9%) had head station at -3, 43 (34.7%) had foetal station at -2 and 6 patients (4.8%) had head station at -1. These results are comparable with the study by Pahwa *et al.* (2017) where the distribution of cases according to the station of fetal head in active labor were 21% free floating head, 55% with station at -3, 17% at -2 station and only 7% at -1 station[13].

In the present study, foetal distress found in 19 patients (47.5%) was a major indication for caesarean section. In the study by Mahajan *et al.* (2016), 55.56%

underwent LSCS for non-progress of labor while foetal distress was second common indication with a rate of 37.03%[6]. Also, comparing with the study by Chaudhary *et al.* (2009), caesarean section was performed for foetal distress in 24%[12].

For the present study, mean duration of first stage of labor was 9.79±2.84 hours and that for second stage of labor was 43.85±27.89 minutes. The mean total duration of labour 10.52±3.23 hours. This is comparable with the study by Chaudhary *et al.* (2009), where mean duration of first stage was 11.04**±2.09 hours and second stage were 37.8±20.3 minutes**[12]. This points towards the fact that duration of labor was longer for high foetal station as that compared to an engaged head.

In the present study, the mean duration of 1st stage of labor was lowest i.e.7.00±0.65 hours for a head station at -1. Whereas the duration was highest i.e. 12.67±1.80 hours with an unengaged head. This association is statistically significant ($p<0.0001$). Similar statistical significance was found for second stage of labor too. These findings correlate with the study by Pahwa *et al.* (2017), 12.77 hours was the duration for 1st stage of labor for patients with free floating head while 8.90 hours for patients with station at -1[13]. Kaur *et al.* (2000)[14] and Shivamurthy HM *et al.* (2014)[15] in their studies also concluded that duration of labor in higher foetal station is more as compared to lower station.

In our study, the mean birth weight of babies with head station at -1 in active phase of labor is 2.88±0.29 kg, at -2 station is 2.78±0.26 kg, at -3 station is 2.82±0.35 kg and those for free floating head in active phase is 3.01±0.37 kg. These findings are comparable with the study by Pahwa S *et al.* (2017) where mean birth weight with head station in active phase at -1 was 2.60±0.30 kg, at -2 was 2.63±0.29 kg, at -3 was 2.88±0.28 kg and for a free-floating head was 3.02±0.26 kg[13].

In our study, 20 out of 124 patients suffered from postpartum haemorrhage. In the study by Pahwa S *et al.* (2017), 19 out of 100 patients had postpartum haemorrhage[13]. In our study, only 4 patients had cervical tear. In the study by Pahwa S *et al.* also 4 out of 100 patients suffered cervical tear. In our study, 5 patients had perineal tear. In the study by Pahwa S *et al.*, 1 patient with head station at -3 had perineal tear[13].

The present study had a total mean 5-minuteAPGAR score of 7.41±1.05. Study by Nousera S EL Nassery (2013)[16] had a total mean 5-minute APGAR score of 8.37±1.256 and the study by Chaudhary *et al.* (2009) had an APGAR score of 9.75±0.59[12].

6. Conclusion

In the present study, Higher rate of normal delivery was seen in the study as compared to caesarean section. The duration of 1st and 2nd stage of labor along with the total duration was higher and significant statistically. The mean birth weight was significantly more in patients with a higher foetal station in comparison with lower stations.

By careful analysis of the results, we can imply that Primigravida at term with high foetal station with spontaneous onset of labor are not all for immediate caesarean section. Watchful expectancy, vigilant intrapartum partographic monitoring can result into normal vaginal delivery with minimal maternal and foetal complications.

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