

Fetal Station at Onset of Labor Depicting Mode of Delivery and Fetal Outcome: Hospital Based Observational Study

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ABSTRACT

Background: Odisha has the highest Neonatal mortality in India at 32/1000 live births. Thirty Special Newborn Care Units in the state provide specialized newborn care. We aimed to examine the duration in relation to station of the head at the onset and its immediate outcomes in respect to mode of delivery, maternal and neonate.

Methods: Hundred primigravidae admitted in labour room with spontaneous onset of labor pains at term gestation were observed over a period of year. The labour process, mode of delivery and maternal and fetal outcome were noted. The proposed outcome of increased duration of labour, maternal and fetal morbidity was studied. Statistical analysis is done in Microsoft Excel sheet online.

Results: Sixty nine percent of the patients were in the age group of 20-25 years. Seven (7%) set into spontaneous labor with free floating head and 30% at -3 and -2 station. 80% of cases in "0" station did not require any augmentation. 100 % of cases with free floating heads required augmentation. Free floating head group had 71.4% caesarean section rate, -3 had 46.6%, -2 had 36.6%, -1 had 7.1%, and 0 had none. Indication for LSCS was 21.87% in arrest of dilation and second stage arrest respectively. The rate was NICU admission was 23%. On average stay in NICU maximum duration was found in FF group of 54 hours.

Conclusion: In conclusion, all primigravidae set into spontaneous labour with high fetal station needs to be given a trial of labour with good monitoring and timely decisions. Constant vigilance was needed throughout the course of labour by using partograms, interventions with augmentation and decisions regarding the mode

of delivery. It is not necessarily an ominous finding and still obstetricians can be optimistic towards vaginal delivery with good operative and NICU facilities.

Key words: Fetal station, mode of delivery, maternal outcome, neonatal outcome

INTRODUCTION

Normal labor is a physiological process of spontaneous onset, low risk at start of labour and remaining the same throughout the labour with vertex presentation between 37 and 42 completed weeks of pregnancy and mother and child are in good condition. A labour that is unduly prolonged gives rise to three types of distress namely fetal, maternal and obstetrician. ^[1] All such cases need to be identified and intervened. Seventy to eighty percent of nulliparous women present with unengaged head in latent phase or at onset of first stage of labor emerging risk of caesarean section increasing proportional to station of fetal head. Nevertheless 80% who present with unengaged head deliver vaginally. ^[2] The purpose of this study is to investigate the relationship of the fetal station at the onset of labour with progress of labour, the mode of delivery, the maternal and fetal outcome.

METHODOLOGY

A hospital based prospective observational study was conducted in Labor delivery and recovery (LDR) rooms at

Niloufer Hospital, Hyderabad. The study period was of one year August 2016 to August 2017. Hundred primigravidae women at 37 to 41 completed weeks of gestation were enrolled in the study.

Inclusion criteria included primigravida with live singleton, full term gestation, vertex presentation, and spontaneous onset of labor with intact membranes. Multigravida, preterm deliveries, multiple gestations, non-vertex presentations, patients with previous history of abortions, patients with obstetric complications like hypertensive disorders of pregnancy, gestational diabetes, antepartum hemorrhage, placenta praevia, patients with medical complications like anemia, cardiac diseases, hepatic diseases, renal diseases, maternal infections, fetal growth restriction, and patients who did not give consent were all excluded from the study.

Statistical analysis is done in Microsoft Excel sheet online.

A detailed history regarding period of amenorrhea and obstetric history was taken at admission. Patient was explained about the details of the study in their own language and consent was taken. Obstetric examination done to confirm gestational age, lie, presentation, and station at onset of labor were recorded. Baseline investigations were done. Monitoring was done by plotting partographs, augmentation was done by ARM when no cervical changes were noted for 2 hours or cervical dilatation was <1 cm/hr. High dose regimen oxytocin infusions were started after an hour of ARM when no cervical changes were noted. Increments were done at 30 minute intervals at the rate of 4m IU/min till adequate uterine action was reached.

A decision of caesarean delivery was taken when no cervical changes noted with ARM and oxytocin infusions with adequate uterine activity for at least 2 hours - arrest of dilation, no descent of fetal head noted in active labour with cervical dilatation-arrest of descent, [4,5] second stage exceeds 2 hours - second stage arrest, fetal heart rate abnormalities- non reassuring fetal status,

and meconium stained amniotic fluid (MSAF).

The mode of delivery, fetal APGAR at 5 min after birth and NICU admissions were noted. Neonates were followed up upto 7 postnatal days.

RESULTS

In the present study, the study population included 100 primigravidae at the onset of active labour.

Table 1. Age wise distribution of patients

Age group	No of patients	percentage
≤ 19 years	25	25
20-25 years	69	69
26-30 years	5	5
31-35 years	1	1
	N=100	100

Numbers of teenage pregnancies (≤ 19 years) were 25 (25%), sixty nine (69%) were in age group 20-25 years and one (1%) were in the age group of 31-35 years.

Table 2. Distribution of study group according to gestational age at onset of labour

Gestational age	No of patients	percentage
38 wks 1 day – 39 wks	21	21
39 wks 1 day – 40 wks	45	45
40 wks 1 day – 41 wks	34	34
	N=100	100
Mean +/- SD	39w 5d ±0.82	

Twenty one (21%) primigravidae set into spontaneous labour between 38w1d and 39 wks, 45% were between 39 wks 1 day to 40 wks and 34% set into spontaneous labour between 40w1d to 41 wks. The mean gestational age of spontaneous onset of labour is 39 weeks 5 days, with standard deviation 0.82.

Table 3. Distribution of study group according to fetal station at onset of labour

Station	No of cases	Percentage
FF floating (5/5)	7	7
"-3" (4/5)	30	30
"-2" (3/5)	30	30
"-1" (2/5)	28	28
0 (1/5)	5	5
	N=100	100

Seven (7%) of patients set into spontaneous labour with free floating head, 30% at -3 station, 30% at -2 station, 28% at -1 station, and 5% with engaged head(0 station).

Table 4. Need for Augmentation of labour in relation to fetal station at onset of labour-

Station	No. of cases	Augmentation		ARM		ARM + oxytocin	
		No.	%	No.	%	No.	%
FF	7	7	100	2	28.6	5	71.4
"-3"	30	27	90	5	18.6	22	81.4
"-2"	30	23	76.6	3	13.04	20	86.95
"-1"	28	16	55.6	9	56.2	7	43.8
"0"	5	1	20	1	20	0	0
	N=100	74	74	20	27	54	73

F=43.66, p=0.007,S

In cases of dysfunctional labour, due to inefficient uterine contractions, augmentation of labour was done either with ARM only or ARM along with oxytocin. Twenty six cases did not require augmentation. Percentages of cases requiring augmentation were more with higher stations. 80% of cases in "0" station did not require any augmentation.

The augmentation of labour was required in 74 cases. All cases with free floating heads required augmentation, 90% of cases with "-3" stations, 76.6 % of cases with "-2" station, and 55.6% of cases with "-1" station required augmentation. Only 20% of cases with "0" station required augmentation.

Free floating fetal head at the time of spontaneous onset of labor, 71.4 % delivered by caesarean section and 28.5 % had outlet forceps delivery. Fetal head at "-

3" station, 50 % had vaginal delivery, 7.6% delivered by outlet forceps and 46.6 % underwent caesarean section. Fetal head at "-2" station, 56.6 % had vaginal delivery, 6.6 % delivered by outlet forceps and 36.6 % underwent caesarean section. The primigravidae with "-1" fetal station, 89.2% had vaginal delivery, 3.5% had outlet forceps delivery, and 7.1 % underwent caesarean section. All patients with fetal head at "0" station had vaginal delivery.

Table 5. Mode of delivery in relation to fetal station at onset of labour

Station	No of cases	FTNVD		Outlet forceps		LSCS	
		No	%	No	%	No	%
FF	7	0	0	2	28.5	5	71.4
"-3"	30	15	50	1	7.6	14	46.6
"-2"	30	17	56.6	2	6.6	11	36.6
"-1"	28	25	89.2	1	3.5	2	7.1
"0"	5	5	100	0	0	0	0
	N=100	62	62	6	6	32	32

Table 6: Indication for LSCS with fetal station at onset of labour.

Indication for LSCS	Arrest of descent		Arrest of dilatation		Second stage arrest		Nonreassuring fetal status		MSAF	
	No	%	No	%	No	%	No	%	No	%
FF	1	16.6	1	14.3	0	0	1	16.6	2	33.3
-3	4	66.6	5	71.4	1	14.3	2	33.3	2	33.3
-2	1	0	1	14.3	5	71.4	2	33.3	2	33.3
-1	0	16.6	0	0	1	14.3	1	16.6	0	0
TOTAL	6	100	7	100	7	100	6	100	6	100

In the study group 6 cases (18.75%) had LSCS for arrest of descent and 7 cases (21.87%) had LSCS for arrest of dilatation. 7 cases (21.87%) had LSCS for second stage arrest. 6 cases (18.75%) had LSCS for non reassuring fetal status and 6 cases (18.75%) had LSCS for meconium stained amniotic fluid (MSAF). No LSCS were noted in 0 station group.

One (14.3%) of free floating group and 2 (6.66%) in -3 group, 2(6.66%) in -2 group and 1(3.5%) in -1 group had extension of episiotomy to third or fourth degree perineal tears. No postpartum

haemorrhage, exhaustion and sepsis were noted in the study group. No maternal deaths were noted in the study group.

Table 7. Fetal station at onset of labour and maternal complications.

Station	No of cases	Perineal tear	
		No	%
FF	7	1	14.3
"-3"	30	2	6.66
"-2"	30	2	6.66
"-1"	28	1	3.5
"0"	5	0	0
Total	N=100	6	6

F=27.78, p=0.013,S

Table 8: Fetal station at onset of labour and fetal outcome.

Station	Number	APGAR≤7 at 5 min	MSAF	Total NICU admissions	
				number	%
FF	7	2	2	4	57.14
-3	30	4	2	6	20
-2	30	6	2	8	26.6
-1	28	4	0	4	14.2
0	5	1	0	1	20
	N=100	17	6	23	23

F=3.64, p=0.15, NS

Twenty three neonates were admitted in the NICU. Six admissions were in view of meconium stained amniotic fluid following ARM and were delivered by LSCS. Seventeen admissions were in view of APGAR scores <7 at 5 minutes. The NICU admissions were 57.14% in free floating group, 20% in -3 group, 26.6% in -2 group, 14.2% in -1 group and 20% in 0 group. No fetal deaths were noted in the study group.

TABLE 9: Mean duration of NICU stay in relation to fetal station at onset of labour-

FETAL STATION	FF	-3	-2	-1	0
MEAN DURATION OF NICU STAY	54 HOURS	47 HOURS	36.25 HOURS	29.5 HOURS	24 HOURS

F=237.8, p=0.0005, HS

The mean duration of stay at NICU was 54 hours in FF group, 47 hours in -3 group, 36.25 hours in -2 group, 29.5 hours in -1 group and 24 hours in "0 group". Eight cases (34.7%) were admitted for less than 24 hours, 12 cases (52.7%) admitted for 24-72 hours and 3 cases (13.04%) which needed intubation were admitted for more than 72 hours and discharged before 7 days of life.

DISCUSSION

Primigravidae with higher stations of fetal heads are considered as additional risk factor and need more investigation and follow up at time of labour and delivery. Therefore such patients should be referred appropriately to hospitals with operative and NICU facilities.

In this study evaluation of relation of fetal station at onset of labour with progress of labour, mode of delivery and fetal outcome was done. In the study group 69% (69 cases) primigravidae belong to 20-25 years age group and 5% (5 cases) belong to 26-30 yrs age group comparable to the study done by Dayal S et al where 70% primigravidae belong to 20-35 yrs group. [6] The distribution of primigravidae according to fetal stations were comparable to other studies of Shivamurthy et al (2014) [7] and Chougutu et al (1977) [8] and included 7% (7 cases) with free floating station, 30% (30 cases) with -3 station, 30% (30 cases) with -2 station, 28% (28 cases) with -1 station and 5% (5 cases) with 0 station i.e., engaged fetal

head. [7] The mean duration of active phase was longer with higher fetal stations i.e., 8.5 hours in FF station, 6.24 hours in -3 station, 5.28 hours in -2 station and 4.52 hours -1 station and 2.92 hours in 0 station. It was comparable to the study done by Shivamurthy et al. [7]

In the study group 26% (26 cases) needed no augmentation and delivered by vaginal delivery and 74% (74 cases) needed augmentation. 20% (20 cases) needed only ARM 54% (54 cases) needed ARM and oxytocin. The incidence of patients requiring augmentation of labour was higher in higher fetal stations as compared to 0 station. 100% (7 cases) in FF station, 90% (27 cases) in -3 station, 76.6% (23 cases) in -2 station, 55.6% (16 cases) of -1 station and 20% (1 case) of 0 station required augmentation. The results were comparable to study done by Shivamurthy et al. [7]

Fifty seven cases (60%) of primigravidae with unengaged fetal head at onset of labour had vaginal delivery, 6.31% (6 cases) had outlet forceps delivery and 33.68% (32 cases) delivered by caesarean section which was significant. Results were comparable to the studies done by Iqbal et al (2009) [10] and Assadi et al (2005). [11]

Complications like arrest of progress of labour were studied. 28% (28 cases) primigravidae had arrest of progress. It was higher in higher fetal stations when compared to 0 station. 28.5% (2 cases) had arrest of progress in free floating group,

30% (9 cases) in -3 group, 23.3% (7 cases) in -2 group and 3.5% (1 case) had arrest of progress in -1 station and no cases had arrest of progress in 0 station group. Results were comparable to study done by Friedman et al. [9] The mean birth weights were more with higher fetal stations. Mean birth weight was 2.95 kgs in FF group, 2.66 kgs in -3 station group, 2.736 kgs in -2 station group, 2.77 kgs in -1 station group and 2.66 kgs in 0 station group. Results were comparable to other study of Dayal et al [6] and Choudary et al. [3]

CONCLUSIONS

- This study indicates that most primigravidae i.e, 95% present with unengaged fetal head in active labour.
- The results of the study also provided support that abdominal palpation of fetal head is an important component in evaluating the women in labour.
- The modes of augmentation have decreased the duration of labour, but required monitoring to assess progress of labour, fetal monitoring and also to avoid hyperstimulation.
- The usage of partograph helped in better understanding of labour disorders and timely interventions were undertaken accordingly.
- The % of primigravidae who delivered by LSCS was higher with higher fetal stations.
- The prediction of complications with high fetal stations at onset of labour helps in better monitoring and appropriate interventions to decrease morbidity.

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