Comparative study of labour course in primigravidae with unengaged head in active labour, with those having engaged head

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Abstract

Background: Labour, presents management challenge on the physician and leaves an emotional impact on the patient. Traumatic experiences blemish her obstetric career. A significant proportion of primigravidae present with unengaged head at the onset of labour. The purpose of this prospective study was to investigate the predictive value of the fetal station at the onset of active labour and to anticipate the need for caesarean delivery.

Objectives: To compare labour course in primigravidae with an unengaged head in early active labour ,who undergo caesarean delivery , with those who had engaged head.

Materials and methods: The study consisted of 200 primigravidae, of which 100 had unengaged heads as cases and 100 engaged heads as controls at 37-42 weeks gestation in Hospitals attached to J.J.M. Medical College, Davangere, during July 2011 to March 2014. Course of labour of 100 primigravidae in early, active labour was prospectively studied.

Result: The mean duration of active phase, and the total duration of second stage was shorter in cases with engaged head. The percentage of prolonged latent phase, prolonged second stage and arrest of progress was more with unengaged heads. Cases with unengaged heads required augmentation more frequently than cases with engaged heads. Arrest disorders and maternal exhaustion were more in cases with unengaged head than in cases with engaged head. The cesarean rates differed significantly between the two groups (14% of those unengaged compared with 6% of those engaged). After adjusting for confounding variables, engagement at the time of onset of active labour was associated with lower risk of cesarean delivery.

Conclusion: The duration of labour was longer in patients presenting with unengaged heads on admission than those with engaged heads. Unengaged heads at term in the absence of CPD calls for constant vigilance throughout the labour, to decide as to when a patient needs intervention in the form of sedation, uterotonics and operative delivery.

Keywords: Engagement, Primigravida, Fetal station, Active labour, Cesarean section.

Introduction

Labour, although a physiological process, can present challenges both for the physician and the patient. The attending obstetrician has to screen out the patients, who are at an increased risk for developing abnormal labour[1, 2].

In an attempt to optimize patient management and identify the women at risk for cesarean delivery, a few investigators have studied the impact of an unengaged vertex at the time of active labour on the rate of caesarean[3].

It has been observed that nulliparous women

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typically enter labour engaged and obtain a positive station (leading edge below the plane of ischial spines) by the onset of active labour. A significant proportion of primigravidae do present with unengaged head at the onset of labour.

Gupta et al[4] observed that in both primigravidae and multigravida, the progress of labour was slow as compared to normal patients. In primigravidae, uterine inertia was more common which could be overcome by oxytocin whereas in multigravidas, incidence of caesarean section was more. Lamberti G[5] found that in only in 1% the presenting part reached station 0 at term before labour had begun.

Freedman and Sachtleen[6] demonstrated that higher station at the onset of labour were associated with an increase in the duration of labour and in the incidence of dysfunctional labour patterns.

Thenmozhi and Iyer[7] noticed that engagement of head at the onset of labour was found in 15.34% cases.Chogtu Leela, Wazira Khanu found that 95% of primigravidae going into spontaneous labour presented with unengaged heads. The high station of head influences the course of labour in certain well defined ways. They have observed a proportionate prolongation in the latent phase of labour in patients with high station.

Therefore an unengaged head in a nulliparous women in active labour may identify the patient at risk for cesarean delivery for arrest disorders[3]. Although the duration of different phases of labour are somewhat longer in them, as compared to patients with engaged heads, a substantial proportion of them deliver vaginally with no increase in maternal or fetal morbidity and mortality[2]. The purpose of this prospective study was to investigate the predictive value of the fetal station at the onset of active labour to anticipate the need for cesarean delivery, secondary to arrest disorders and the maternal and fetal well being[1]. Arulkumaran S et al[8] showed that the management protocol for augmentation of labour seems to be a safe procedure and might reduce the rising caesarean section rate for dystocia.

Materials and methods

The study was conducted on 200 primigravidae with 100 unengaged heads as cases and with 100 engaged heads as controls at 37-42 weeks gestation in Bapuji Hospital, Chigateri General Hospital and Women and Child Hospital attached to J.J.M. Medical College, Davangere, during July 2011 to March 2014. The station at onset of active labour recorded. Engagement considered to be at a station 0 or below. Primigravidae 37-42 weeks with singleton gestation with vertex presentation in active phase of labour with intact membranes were included.

Inclusion Criteria

- Primigravidae 37-42 weeks with singleton gestation with vertex presentation in active phase of labour with intact membranes.

Exclusion criteria

- Non vertex presentation
- Multiple gestation
- Delivery at less than 37 weeks or greater than 42 weeks gestation
- Major degree CPD
- Patients with previous cesarean section
- Patients with obstetric complications like preeclampsia. GDM
- Patients with medical complications like anaemia, renal diseases, cardiac disease, hepatic disease.

Results

The mean duration of active phase, the duration of second stage was shorter when cases with engaged fetal head were compared with unengaged fetal head. The mean total duration of labour was more for cases who were admitted with unengaged fetal head. The percentage of prolonged latent phase, prolonged second stage and arrest of progress was more with unengaged fetal heads.

Cases with unengaged heads required more augmentation than cases with engaged heads. Arrest disorders and maternal exhaustion were more in cases with unengaged head than in cases with engaged head. The cesarean rates differed significantly between the two groups 18% of those unengaged compared with 6% of those engaged. After adjusting for confounding variables, engagement at the time of onset of active labour was

Table1. Mean active phase according to fetal stations

Station	No.of cases	Mean active phase (Hrs)	SD
FF	2	4.50	0.14
-3	36	5.17	1.11
-2	24	4.26	0.60
-1	21	4.2	1.07
0	93	3.66	0.83

F=19.3, p<0.001, HS

The mean duration of active phase was 4.50 hrs in free floating, 5.17 hrs in -3, 4.26 hrs in -2, 4.13 hrs in -1 and 3.66 hrs in 0 group of fetal station. The mean duration of active phase in higher stations i.e., FF ,-3,-2 and -1 was longer as compared to 0 station [Table 1]

Table 2. Mean total duration of labour and fetal stations

Station	No.of cases	Mean total duration(hrs)	SD
FF	2	16.6	1.3
-3	36	16.0	2.4
-2	24	13.2	1.7
-1	21	12.9	2.3
0	93	10.5	1.6

F=62.03, p<0.001, HS

The mean total duration of labour in higher stations i.e., with free floating fetal head, with fetal head at -3, -2 and -1 the duration was 16.6hrs,16hrs,13.2hrs and 12.9hrs respectively. The mean total duration of labour in 0 station was 10.5hrs. The difference in mean total duration of labour with free floating fetal head and -3 station when compared with fetal head at 0 station was significant [Table 2].

Table 3. AUGMENTATION OF LABOUR

Station	No	No Augmentation		Augmentation		ARM	Oxy.	ARM + Oxy
		No.	%	No.	%			
FF	10	-	-	10	100	2 (20%)	-	8 (80%)
-3	46	4	8.7	42	91.3	6 (13%)	-	36 (78.3%)
-2	24	6	25	18	75	6 (25%)	-	12(50%)
-1	21	2	10	19	90	8 (40%)	-	11 (50%)
0	99	41	41.4	58	58.6	12 (12%)	4 (4%)	42 (42%)
Total	200	53	26.5	147	73.5	34	4	109

In cases of dysfunctional labour due to inefficient uterine contractions, augmentation of labour was done with either oxytocin and/or artificial rupture of membranes. Fifty four cases did not require augmentation and most of these cases belonged to 0 station group.

The augmentation of labour was required in 147 cases. The incidence of patients who required augmentation of labour was higher in higher fetal stations i.e. with free floating fetal heads,-3 ,-2 and -1 station as compared to 0 fetal stations i.e. engaged head.100% of cases with free floating fetal head, 91.3% of cases at -3 station, 75% of cases with fetal heads at -2 station and 90% of cases at -1 station required augmentation. Only 58% of cases with engaged fetal head i.e. 0 station required augmentation [Table 3] .

Table 4. MODE OF DELIVERY

Station	No.of Cases	FTND		Forceps		Vacuum		LSCS	
		No of cases	%age	No of Cases	%age	No of cases	%age	No of cases	%age
FF	10	-	-	2	20	-	-	8	80
-3	46	26	56.5	8	17.4	2	4.3	10	21.7
-2	24	22	91.7	2	8.3	-	-	-	-
-1	21	21	100	-	-	-	-	-	-
0	99	87	87.9	4	4.0	2	2.0	6	6.1
Total	200	156	78.00	16	8.0	4	2.0	24	12.0

Among the primigravidae in whom fetal head was free floating at the time of admission none had normal vaginal delivery, 20% had forceps delivery and 80% delivered by caesarean section.

Among the primigravidae who had fetal head at -3 station at the time of admission 56.5% had normal vaginal delivery, 17.4 % delivered by forceps ,4.3% by vacuum and 21.7% underwent caesarean section.

Among the primigravidae in whom fetal head was at -2 station 91.7 had normal vaginal delivery and 8.3% had forceps delivery.

100% of primigravidae with fetal head at -1 station at the time of admission had normal vaginal delivery. Eighty eight percent of primigravidae with fetal head at 0 station had normal vaginal delivery,4% had forceps delivery,2% had vacuum delivery and 6% underwent cesarean section [Table 4].

Table 5. COMPARISON OF MODE OF DELIVERY BETWEEN ENGAGED AND UNENGAGED HEADS

	FTND		Instrumental delivery		LSCS		Total
	No.of cases	%age	No.of cases	%age	No.of cases	%age	
Engaged	87	88	6	6	6	6	99
Unengaged	69	69	14	14	18	18	101

Chi-square = 11.76, p=0.05, Significant

93% of primigravidae with engaged head at onset of active labour delivered vaginally of which 88% was normal vaginal delivery and 6% by instrumental delivery. 82% of primigravidae with unengaged head at onset of active labour delivered vaginally of which 68% was normal vaginal delivery and 14% by instrumental delivery.This difference was not significant.However only 6% of primigravidae with engaged heads had cesarean delivery compared to 18% of primigravidae with unengaged heads who had cesarean delivery which was significant [Table 5].

Table 6. FETAL STATION AT ONSET OF LABOUR AND ARREST OF PROGRESS OF LABOUR AND MATERNAL COMPLICATIONS

Station	No	Arrest of Progress		Maternal exhaustion		Perineal tear	
		No	%	No	%	No	%
FF	10	6	60	2	20	2	20
-3	46	10	21.7	4	8.7	4	8.7
-2	24	-	-	-	-	-	-
-1	21	-	-	-	-	-	-
0	99	-	-	2	2.0	2	2
Total	200	16	8	8	4	8	4
		X^2=61.05, P<0.001, HS		X^2=6.09, P<0.05, S		X^2=6.09, P<0.05, S	

The incidence of arrest of progress of labour in patients with higher fetal station was higher when compared to those with lower fetal stations. The arrest of progress of labour was seen in 60% and 21% of cases in higher fetal station groups i.e. with free floating fetal head and with fetal head at -3 station respectively. There was no case of arrest of progress of labour in 0 group .

No maternal death was there in the present study. Maternal exhaustion was seen in 4 patients 1 belonging to FF group,2 in-3 group and 1 in 0 station group for whom forceps application was done and 1 patient in -3 group had vacuum delivery. One patient belonging to free floating group,2 in -3 group and 1 in o station group had perineal tear [Table 6].

Table 7. FETAL STATION AT ONSET OF LABOUR AND FETAL DISTRESS

Station	No.	Fetal Distress	
		No.of cases	Percentage
FF	10	2	20
-3	46	2	4.3
-2	24	-	-
-1	21	-	-
0	99	6	6.1

$X^2 = 7.38$, p=0.12, NS

The incidence of fetal distress was higher in higher fetal stations as compared to lower fetal stations. Fetal distress manifesting as alteration in fetal heart rate or meconium staining of liquor was seen in 5 cases.

Fetal distress was seen in 20% and 4.3% of cases with free floating group and -3 group respectively. Both delivered by cesarean section. Six percent of patients with fetal head at 0 station had fetal distress all delivered by cesarean section [Table 7] .

Discussion

In this study 100 primigravidae with unengaged heads as cases, and 100 cases with engaged heads as controls who fulfilled the inclusion criteria were selected.

In this study we evaluated the relationship of the fetal station at the onset of active labour with the progress of labour, mode of delivery and risk of cesarean section. In the present study the mean duration of active phase was longer with higher stations as compared to lower stations which correlates well with the study done by Devinder Kaur et al[9]. And Aparna Shrotri et al[10].

The mean duration of second stage of the present study was comparable with the study done by Devinder Kaur et al. The mean duration of active phase in higher stations i.e., FF ,-3,-2 and -1 was longer as compared to 0 station. The difference in mean total duration of labour with free floating fetal head and -3 station when compared with fetal head at 0 station was significant.

In cases of dysfunctional labour due to inefficient uterine contractions, augmentation of labour was done with either oxytocin and/or artificial rupture of membranes. The incidence of patients who required augmentation of labour was higher in higher foetal stations i.e. with free floating fetal heads,-3 ,-2 and -1 station as compared to 0 foetal stations i.e. engaged head.

These results are comparable with the results of the study done by Daniel Roshanfekr et al. In his study 95% had vaginal delivery while 5% underwent caesarean section.

Cardozo LD, et al[11] showed that Primary dysfunctional labour could be improved by oxytocin, had an incidence of 93.8% vaginal delivery, but if there was no provement in the rate of cervical dilatation when oxytocin was administered the vaginal delivery rate was only 22.7%.

In the present study the overall rate of vaginal delivery was 82% whereas 18% underwent caesarean section in cases with unengaged head. These results are comparable with the results of the study done by Daniel Roshanfekr et al. In his study 86% had vaginal delivery while 14% underwent caesarean section.

In all, 156 primigravidae i.e. 78% had normal vaginal delivery, 8% delivered by forceps application ,2% by vacuum delivery and 12% of primigravidae were delivered by caesarean section. Among the primigravidae in whom foetal head was free floating at the time of admission none had normal vaginal delivery, 20% had forceps delivery and 80% delivered by caesarean section.

Among the primigravidae who had foetal head at -3 station at the time of admission 56.5% had normal vaginal delivery, 17.4 % delivered by forceps, 4.3% by vacuum and 21.7% underwent caesarean section.

Among the primigravidae in whom foetal head was at -2 station 91.7 had normal vaginal delivery and 8.3% had forceps delivery.100% of primigravidae with foetal head at -1 station at the time of admission had normal vaginal delivery. 88% of primigravidae with foetal head at 0 station had normal vaginal delivery,4% had forceps delivery,2% had vacuum delivery and 6% underwent caesarean section.

Ninty three percent of primigravidae with engaged head at onset of active labour delivered vaginally of which 88% was normal vaginal delivery and 6% by instrumental delivery.

Of them, 82% with unengaged head at onset of active labour delivered vaginally of which 68% was normal vaginal delivery and 14% by instrumental delivery. This difference was not significant.

However only 6% of primigravidae with engaged heads had cesarean delivery compared to 18% of primigravidae with unengaged heads who had cesarean delivery which was significant.

The incidence of arrest of progress of labour in patients with higher foetal station was higher when compared to those with lower foetal stations. The arrest of progress of labour was seen in 60% and 21% of cases in higher foetal station groups i.e. with free floating foetal head and with foetal head at -3 station respectively. There was no case of arrest of progress of labour in 0 group.

No maternal death was there in the present study. Maternal exhaustion was seen in 4 patients 1 belonging to FF group,2 in-3 group and 1 in 0 station group for whom forceps application was done and 1 patient in -3 group had vacuum delivery. One patient belonging to free floating group,2 in -3 group and 1 in o station group had perineal tear. The incidence of fetal distress was higher in higher fetal stations as compared to lower fetal stations.

Conclusion

In our study it has been observed that the duration of labour was longer among patients admitted with unengaged heads than those with engaged heads. Thus labour was almost uneventful with engaged heads.

Labour appeared to be dysfunctional in only a small proportion of the patients with unengaged heads. Unengaged heads at term in the absence of CPD calls for constant vigilance on the part of the obstetrician throughout the course of the labour, so as to make him/her decide as to when a patient needs intervention in the form of sedation, uterotonics, vaccum suction or caesarean section.

This prospective study indicated that among primigravidae an unengaged vertex in the active phase of labour is a significant risk factor for caesarean delivery secondary to arrest disorders.

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