

A COMPARATIVE STUDY OF PRIMIGRAVIDA WITH UNENGAGED V/S ENGAGED 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 compare the outcome of labour between the unengaged and engaged head at the onset of labour at term in primigravidas. The aim was to determine the course of labour in between unengaged and engaged head in primigravida at term at the onset of labour and to study the maternal and neonatal outcome.

Design: A prospective hospital-based comparative study.

Methods: In this prospective comparative study, primigravida women at onset of labour at term who were admitted in labour room and satisfying inclusion and exclusion criteria were included. Group (I) study group included 110 primigravida at term with unengaged (at 37-41 weeks) head at onset of labour and in Group (II) Control Group 110 primigravida at term with engaged (at 37-41 weeks). 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 Induction and augmentation of labour or surgical intervention, mode of delivery and fetomaternal outcome was recorded.

Results: In Group I, 83.64% cases went into spontaneous labour while 90 % cases in Group II. 16.36% cases in group I and 10% cases in group II needed induction of labour with PGE2 gel. In group I, 68.18% required augmentation of labour compared to 33.63% in group II. Duration of 1st, 2nd stage of labour and total duration was more in group I as compare to group-II. Incidence of normal vaginal delivery and LSCS were 52.73%, 32.73% respectively in group I while 71.82%, 17.27% respectively in group II, the difference was statistically significant with p-value 0.011. Fetomaternal morbidity which was higher in group-I as compare to group-II was documented which was not statistically significant.

Conclusion: The unengaged head in primigravida at the onset of labour at term can have normal vaginal delivery with appropriate induction and augmentation of labour and constant vigilance throughout the labour by partograph monitoring. Which can reduce primary caesarean delivery rate, maternal morbidity and healthcare expenditure in unengaged primigravida. Proper trial of labour in primigravida with unengaged head at term in the absence of cephalopelvic disproportion, vaginal delivery is possible with watchful expectancy with appropriate means of intervention.

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. The primigravida are a group at risk as their capacity for child bearing has never been put to the test. 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. 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 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. 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.³

The purpose of the present study was to analyse the progress of labor in primigravida with unengaged versus engaged fetal head, to determine the role of active medical and surgical interventions and to determine fetomaternal outcome.

Methodology

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

Group (II) Control Group included primigravida at term with engaged (at 37-41 weeks) head at onset of labour.

Inclusion Criteria

- Live singleton foetus
- Intact membranes
- Fetal weight between 2.5-4 kg
- Cervical dilation \leq 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 $>2/5$ th of the fetal head was palpable on abdominal examination and/ or both poles of fetal head palpable by 2nd pelvic grip.

Women were allocated to the study and control group depending upon the engagement of the fetal head. Those with the unengaged head were from study group (I) and engaged head from control group (II).

Pelvic assessment and bishop's score was done early in the labour. The Muller Munro Kerr 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 from both the groups 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 total duration of labour including duration of latent phase, duration of active phase, rate of cervical dilatation in active phase, duration of second stage, intrapartum 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. Women 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 Post partum 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

The mean age of women in Group I and Group II was 22.98 ± 3.28 yrs and 22.44 ± 3.08 yrs respectively. Majority of the women were in the age group 21-25 yrs which corresponds to the child bearing age group. Maximum number of cases were between 39-40 weeks of gestational age with mean gestational age for 39.09 ± 0.70 weeks and 38.94 ± 1.12 weeks in Group-I and Group-II respectively. The mean maternal height was 156.44 ± 5.42 cm for Group I and 157.63 ± 4.77 cm for group II. Majority of the women in both groups were between 156-160 cm as accounts 42.73% in group I and 41.82% in group II.

In Group I, 34.54% of women had free floating head, vertex was at -3 station; -2 station and -1 station in 33.64%, 25.45% and 6.36% women respectively. All the women in group II had vertex at '0' station. Maximum number of women had cervical dilatation of 2 cm at the time of admission.

In Group I, 83.64% cases went into spontaneous labour while in Group II, 90% cases went into spontaneous labour. 16.36% cases in group I and 10% cases in group II needed induction of labour with PGE2 gel. In group I, 68.18% required augmentation of labour compared to 33.64% in group II. Augmentation of labour required 6.36% by ARM, 48.18% by oxytocin and 13.64% by both ARM and oxytocin in group I while in group II augmentation of labour was 8.18%, 20% and 5.45% respectively. The difference was statistically significant for augmentation of labour with p-value < 0.001 .

Table 1: Distribution of Cases According to Stages of Labour

Stage of Labour	Group-I		Group-II		p-value
	Mean ± Std. Deviation		Mean ± Std. Deviation		
1 st (LP+AP) (hrs)	12.79 ± 2.69		9.06 ± 2.71		<0.001(S)
2 nd (min)	43.83 ± 26.05		29.15 ± 11.02		<0.001(S)
3 rd (min)	7.73 ± 2.71		7.25 ± 3.25		0.311 NS
Total Duration of Labour (hrs)	13.58 ± 2.79		9.55 ± 2.70		<0.001(S)

The mean duration of first, second stage of labour and total duration of labour was significantly prolonged in group I as comparable to group II. P-value was <0.001 (highly significant).

Table 2: Distribution of Cases According to Mode of Delivery

Mode of Delivery	Group-I		Group-II		p-value
	No.	%	No.	%	
FTVD	58	52.73	79	71.82	0.011 (S)
Instrumental (Vaccum & Forceps)	16	14.54	12	10.91	
LSCS	36	32.73	19	17.27	
Total	110	100.00	110	100.00	

Thus difference according to mode of delivery was statistically significant among the both groups with P-value =0.011.

The most common indication for LSCS in the group I 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. While in group II, the most common indication for LSCS was fetal distress (57.89%), followed by other indications were failure to progress (36.84%) and second stage arrest (5.26%).

Most common maternal complication was PPH and perineal tear each 5.45% followed by cervical tear (0.91%) in group I women. Most common maternal complication in group II was PPH as 3.64% and 1.82% cases presented with perineal tear. The difference between both group regarding maternal complications was not statistically significant.

The mean APGAR score at 1 minute was 6.79 ± 0.84 for Group-I and 7.03 ± 0.67 for Group-II which was statistically significant among both the groups with p-value 0.020. The mean APGAR score at 5 minute was 8.69 ± 0.77 for Group-I and 8.93 ± 0.69 for Group-II which was statistically significant among both the groups with p-value =0.016. APGAR score ≥ 7 was in 80% neonates and APGAR score < 7 was in 20% neonates at 1 min in Group-I while in 90.91% and 9.09% neonates in Group-II at 1 min respectively. The APGAR score ≥ 7 was in 98.18% neonates and APGAR score < 7 was in 1.82% neonates at 5 min in Group-I while in 99.09% and 0.91% neonates in Group-II at 5 min respectively.

Mean birth weight was 3.02 ± 0.32 kg in group I and 2.89 ± 0.32 kg in group II. The weight of neonate was higher in group I as compare to group II.

Table 3: Distribution of Cases According to Birth Weight

Birth Weight (kg)	Group-I		Group-II		p-value
	No.	%	No.	%	
2.5 – 3	42	38.18	62	56.36	0.010 (S)
3 – 4	68	61.82	48	43.64	
Total	110	100.00	110	100.00	
Mean ± SD	3.02 ± 0.32		2.89 ± 0.32		

The difference was significant for engagement of head with p -value=0.010. The weight of neonate was higher in Group-I as compare to Group-II.

In present study 8.18% neonates from Group-I and 3.64% neonates from Group-II was admitted in NICU for various indications.

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)**⁴ and **Goyal A et al (2019)**⁵

Our study was comparable to the studies done by **Sirisha VS et al (2021)**⁴, **Unnisa S et al (2019)**⁶, **Pahwa S et al (2018)**² where maximum cases were in gestation age between 39 to 40 weeks.

In the study conducted by **Bhadra DM et al (2018)**⁷, 83% and 90% cases had spontaneous onset of labour in unengaged and engaged head group which were comparable to our study. The observations were made by **Pahwa S et al (2018)**² that 86% unengaged women had spontaneous onset of labour. **Bhadra DM et al (2018)**⁷ showed that induction of labour required in 17%cases in unengaged head group and 10%cases in engaged 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)**⁴ in which augmentation was required 61% and 38% in group A and group B respectively. Similar study conducted by **Bhadra DM et al (2018)**⁷ in which 73% and 36% women required augmentation in unengaged (UE) and engaged (E) groups respectively. The observations were comparable to our study.

Sirisha VS et al (2021)⁴ 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 while 8.91±2.94 hours and 23.59±8.99 minutes in group B. Another study done by **Bhadra DM et al (2018)**⁷ mean duration of 1st and 2nd stage of labour were 14.21 hours and 34.38 minutes in unengaged group while 12.5 hours and 29.44 minutes in engaged group. According to **Sudhir S et al (2016)**⁸ 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)**⁴ total duration of labour was 13.53 hours in unengaged group and 9.73 hours in engaged group (p value-0.000). The observations were comparable to our study.

In the present study 52.73% women underwent normal vaginal delivery, 14.54% instrumental vaginal delivery and 32.73% underwent LSCS in Group-I and 71.82% underwent normal vaginal delivery, 10.91% instrumental

vaginal delivery and 17.27% underwent LSCS in Group-II. A similar study done by **Bhadra DM et al (2018)**⁷ showed that in the unengaged head group 53% underwent normal vaginal delivery, 10% underwent instrumental vaginal delivery, and 37% underwent LSCS and 70% underwent normal vaginal delivery, 7% underwent instrumental vaginal delivery, and 23% underwent LSCS in engaged head group. This study is comparable to present study. In another study done by **Shivamurthy HM et al (2014)**⁹ in the unengaged head group 69% underwent normal vaginal delivery, 14% underwent instrumental vaginal delivery, and 18% underwent LSCS while in the engaged head group 87%, 6% and 6% respectively.

The observations were comparable to a study conducted by **Bhadra DM et al (2018)**⁷, the 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. While in engaged head group the most common indication for caesarean was fetal distress in 52.17% followed by failure to progress in 39.13% and failure of induction in 13.51% cases.

According to **Bhadra DM et al (2018)**⁷, in unengaged group, 11% patients had post-partum hemorrhage, 7% patients had perineal tear, 3% patients had cervical tear, 3% patients had wound infection and 1% patient in engaged group had post-partum psychosis whereas in engaged group, 7%, 4%, 5% and 2% had same complications respectively. Similar observations were made by **El-Desouky ESA et al (2021)**¹⁰ 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%). The observations are comparable to our study.

The observations were comparable to study conducted by **Chaudhary S et al (2009)**¹¹ study, the mean APGAR at 1 minute was 7.66±0.66 in unengaged head group and 7.86±0.43 in engaged head group which showed significant difference with $p = 0.002$. A similar study conducted by **Bhadra DM et al (2018)**⁷ where APGAR at 1st minute was >7 in 70% neonates and APGAR score was <=7 in 30% cases in unengaged group while 74% and 26% respectively in engaged group. APGAR at 5 min was >7 in 92% neonates and <=7 in 8% neonates in unengaged group while 93% and 7% in engaged group respectively.

In **Sirisha VS et al (2021)**⁴, the mean neonatal birth weight was 3.03±0.437kg in unengaged head group and 2.88±0.456kg in the engaged head group with $P = 0.149$ (Not significant). The results were compared to the study conducted by **Chaudhary S et al (2009)**¹¹ in which mean birth weight was 3.23±0.39kg in unengaged head group and 3.07± 0.35kg in engaged head group. The mean birth weight was statistically significant in both the groups as comparable to our study. In study done by **Dayal S et al**

(2014)³⁷ observed that the mean birth weight was 2.77 kg in the unengaged group and 2.065 kg in engaged group. The difference in birth weight in both groups was statistically significant which was very similar to present study.

The study conducted by **Sirisha VS et al (2021)**^{4,7} babies from the unengaged head group and 3 babies from the engaged head group were admitted to the NICU.

Conclusion

It was concluded that in unengaged head in primigravida at term causes apprehension in the minds of obstetrician. If the attitude of watchful expectancy with appropriate means of intervention with appropriate induction and augmentation of labour and constant vigilance throughout the labour by partograph monitoring, especially in cases where no aetiological factor is found for unengaged head. Even though the duration of labour is increased significantly with unengaged head, with proper counselling of the women most of women delivered vaginally. There is no significant difference noted in the maternal and neonatal morbidity. Proper trial of labour in primigravidas with unengaged head can reduce primary caesarean delivery rate, maternal morbidity and healthcare expenditure.

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