OUTCOME OF LABOUR IN NULLIPARA AT TERM WITH UNENGAGED VERTEX

Saima Chaudhary, Rubina Farrukh, Asma Dar, Shamsa Humayun
Department of Obstetrics and Gynaecology, Fatima Jinnah Medical College, Lahore, Pakistan

Background: Primigravidas with unengaged foetal head at term should be regarded as high risk cases. It is seen that nuglliparous women with the floating foetal head demonstrate higher rates of caesarean section than those with dipping or engaged head in early labour. These cases should be regarded as high risk and identified early and should be referred to a tertiary care centre where good facilities for operative delivery are available. The present study was undertaken to determine the outcome of labour in nulliparous women with unengaged head and compare it with those who present with engaged head at term as a case control study. The objective of the study was to enumerate the outcome of labour in nulliparous women presenting with unengaged head at term and compare it with those who present with engaged head in early active labour. **Methods:** It was a case control study, completed in 11 months, conducted in Department of Obstetrics and Gynaecology, Sir Ganga Ram Hospital, Lahore. 300 women were selected by convenience sampling. 150 nulliparous women who presented with unengaged head in early active labour were taken as cases, out which 2 women left against medical advice with their medical records so data was missing leaving 148 patients in this group. While 150 nulliparous women who presented with engaged head were taken as controls. **Results:** C-section rates was significantly found to be more in unengaged group being 16.89%, compared with 5.33% in engaged group (p=0.000). Most of C-sections were carried out due to failed progress of labour (48%). Patients with unengaged foetal head had significantly lower APGAR scores at 1 (p< 0.002) and 5 min (0.003) and higher mean birth weights (p= 0.002).Cases also had significantly longer 1st (p=0.0001) and 2nd stage (p=0.004) of labour. **Conclusion:** Engaged vertex at the onset of active labour is associated with a lower risk of caesarean delivery in nulliparous women. Patients with unengaged vertex are at higher risk for caesarean delivery due to arrest disorders. In addition to the higher caesarean rate patients with unengaged vertex are at risk of having lower foetal APGAR scores and higher mean birth weights of newborns.

Key words: labour outcome, nullipara, term pregnancy, unengaged vertex

INTRODUCTION

Although the engagement of the foetal head is usually regarded as a phenomenon of labour, in nulliparas it commonly occurs during the last few weeks of pregnancy.[1] When it does so, it is confirmatory evidence that pelvic inlet is adequate for that foetal head. Failure of the foetal head to engage in early labour is a greater indicator of operative birth.[2] According to a recent study nulliparous patients at 41 weeks or greater with an unengaged vertex are 12.4 times more likely to be delivered by caesarean section than a patient with an engaged vertex.[3] The unengaged vertex is a significant risk factor for caesarean delivery due to labour arrest disorders.[4] It may be possible to offer caesarean delivery to patients at highest risk, reducing the potential morbidity of long labour or failed operative vaginal delivery followed by a late caesarean delivery.[5]

The overall mortality rate from caesarean section is 6/100,000, which is 3–7 times higher than that in vaginal delivery.[6] Caesarean that are performed after a patient has been in labour have higher rates of mortality and morbidity when compared with vaginal delivery or elective caesarean section.[7,8] If it can be predicted that which patients are at higher risk of caesarean section when they enter labour, we can offer caesarean section before a prolonged course of labour, thus unnecessary time in labour, increased cost and complications may be reduced. The other important fact is that once these cases are identified early they can be referred to a tertiary care centre where good facilities for operative delivery are available.

The present study was undertaken to determine the outcome of labour in nulliparous women with unengaged head and compare it with those who present with engaged head at term as a case control study. It helped us understand the relationship of head level in early active labour in nulliparas with mode of delivery and recognize the possible associated factors so that high risk cases could be identified early. It will help us to offer them proper and timely management and reduce maternal and neonatal morbidity.

MATERIAL AND METHODS

The objective of the study is to enumerate the outcome of labour in nulliparous women presenting with unengaged head at term and compare it with those who present with engaged head in early active labour.

Outcome of labour was taken in terms of no. of women undergoing Caesarean section, instrumental and spontaneous deliveries, and birth weights and APGAR scores of newborns. Engaged foetal head was defined as head at or below 0 station on pelvic examination. Head at -3,-2 or -1 station was defined as unengaged foetal head .

It was a case control study completed in 11 months, done in department of Obstetrics and Gynaecology, Sir Ganga Ram Hospital Lahore.

Three hundred (300) women were selected by convenience sampling. 150 nulliparous women who presented with unengaged head in early active labour were taken as cases, out which 2 women left against medical advice with their medical records so data was missing leaving 148 patients in this group. While 150 nulliparous women who presented with engaged head were taken as controls.

Nulliparous women with singleton foetus presenting as cephalic at term (37–41weeks), in early labour with regular uterine contractions and cervical dilatation of 3 cm with unengaged or engaged foetal head were included in the study. Controls included in the study were age matched with case ±5 years. Patients having multiparity, gestation <37wks or >41 wks, induction of labour, contracted pelvis, twin pregnancy, or any obvious contraindication to vaginal delivery as placenta previa were not included in study.

Height was recorded in centimetres and weight was recorded in Kg. From these reading BMI was calculated and BMI of 26 was taken as a cut off value for comparison between cases and controls in two by two tables. Duration of gestation was estimated according to patients last menstrual period if they were sure about the date and had regular menstrual cycles or was calculated from first trimester ultrasound. The abdominal and vaginal examination of all cases and controls were done to find the station of foetal vertex and bishop scores. Pelvic configuration was assessed by clinical pelvimetry and patients with absolutely contracted pelvis were excluded from the study.

Duration of all the three stages of labour was recorded and both the cases and controls were followed prospectively to find out the outcome of labour. Outcome of labour was seen in terms of no of instrumental, vaginal or caesarean delivery. Foetal APGAR scores at 1 and 5 min were also recorded. Any indication for caesarean or instrumental delivery was also noted. While calculating results two patients were dropped in cases because of incomplete data available from them.

It was computer based and SPSS (Version 11) was used for analysis. Data was cleaned for unusual values. Student's *t*-test was applied and *p* value calculated to assess degree of significance. The $p<0.05$ was considered as significant. Proportions were analysed by Z test.

RESULTS

It was a case control study of 298 patients. 148 patients with unengaged head were identified as cases while 150 patients with engaged head were taken as controls. Table 1 shows demographic characteristics of the women. The mean maternal weight, BMI and mean age were not significantly different among the two groups. There was significant difference in height of cases and controls height being shorter in cases ($p=0.002$) (Table-1).

Table-1: comparison of maternal characteristics between cases & controls

	Unengaged Vx (Cases)	Engaged Vx (Controls)	*p*-value
Mean Maternal Weight	68.87±6.69	69.89±5.00	0.136
Mean Maternal Height	152.75±3.091	153.70±3.24	0.002
Mean Gestational age at delivery	274.6±7.17	273.1±7.59	0.093
Mean BMI	29.57±3.29	29.63±2.58	0.85
Mean Age	21.96±3.52	21.51±3.45	0.26

Table-2 shows the outcome of labour in terms of caesarean, instrumental and vaginal delivery and compares both groups. The caesarean section was the mode of delivery in 25 patients with unengaged head versus 8 patients with engaged head. Thus a statistically significant rise in caesarean section was noted being 16.89% in cases and 5.33% in controls ($p=0.000$). Eighty-nine patients had spontaneous vaginal delivery in group with unengaged head compared with 114 patients with engaged head. Here a statistically significant decrease in spontaneous vaginal delivery was observed in cases compared with controls, spontaneous vaginal delivery rate being 60.14% versus 76% respectively. The instrumental delivery rate was significantly higher in cases (Table-2).

Table-2: comparison of mode of delivery between cases and controls

	LSCS	Instrumental	SVD
Cases	25 (16.89%)	34 (22.97 %)	89 (60.14 %)
Controls	8 (5.33%)	28 (18.67%)	114 (76 %)
***p*-value**	0.000	0.000	0.000

Table-3 shows relation of foetal station with outcome in terms of mode of delivery. It shows that C section rate was higher when patient presented with foetal station at -1 or above being 25%, 17% and 14% at -3, -2, and -1 respectively whereas at 0, +1, and +2 it is 5.8%, 4%, and 0% respectively.

Table-3: Station at onset of active labour & mode of delivery

Foetal Station	≥-3	-2	-1	s0	+1	+2
C-Section	6 25%	7 17%	12 14%	7 5.8 %	1 4.0%	0%
Instrumental	5 27%	7 17.0%	22 25%	27 60.9%	5 20%	0%
SVD	11 55.5%	26 60%	52 60%	86 70%	19 76%	5 100%

Table-4 shows causes of caesarean delivery in both groups. In the unengaged groups most of the caesareans were performed due to failed progress i.e. in 12 cases (48%). Foetal distress was second common indication being responsible for caesareans in 6 cases (24%). 2 (8%) patients underwent caesarean delivery due to deep transverse arrest and 1 patient had cervical septum leading to caesarean delivery while brow (4%) chorioamnionitis (8%) and APH (4%) were other reasons

Table-4: Causes of caesarean section in both groups

	Unengaged head (cases)	Engaged head (controls)
Failed Progress	12 (48%)	1 (12.5%)
Foetal Distress	6 (24%)	5 (62.5%)
APH	1 (4%)	1 (12.5%)
Cervical Septum	1 (4%)	-
Chorioamnionitis	2 (8%)	-
Brow	1 (4%)	-
Deep Transverse Arrest	2 (8%)	-
PIH	-	1 (12.5%)

Table-5 shows comparison of duration of first and 2nd stage of labour in both groups. In engaged group duration of 1st stage was 9.67±1.7 hrs whereas in unengaged group it was 11.04±2.04 (p<0.0001). Second stage duration was 37.8±20.3 in unengaged group whereas it was 30.5±23.2 in engaged group (p=0.004). It showed that both first and second stage was significantly prolonged in unengaged group of patients.

Table-5: Comparison of duration of 1st and 2nd stage of labour between cases and control

	Engaged head	Unengaged head	T Value	*p* Value
Duration of 1st stage (hr)	9.67±1.7	11.04±2.04	6.56	<0.0001
Duration of 2nd stage (min)	30.5 ± 23.2	37.8 ± 20.3	-2.43	0.004

Table-6 shows 39 (26.3%) patients in the unengaged group had APGAR scores less than 8 at 1 min compared to only 16 (10.6%) patients in engaged group(p=0.0005). Twenty-four (16.21%) patients had an APGAR scores <10 at 5 min in unengaged group as compared to only 4 (2.6%) patients in engaged group(p=0.0001). The mean birth weight noted in cases was significantly higher than that in controls (3.23±0.39 versus 3.07±0.35, p=0.0002). The mean APGAR score at 1 min and 5 min in cases was significantly higher than controls (Table-6).

Table-6: Comparison of foetal outcome between two groups

	Engaged head	Unengaged head	P value
Mean Birth Weight	3.23±0.39	3.07±0.35	0.0002
Mean APGAR Score at 1 min	7.86±0.43	7.66±0.66	0.002
Mean APGAR score at 5 min	9.91±0.25	9.75±0.59	0.003

DISCUSSION

Nulliparas with unengaged head are at substantially higher risk of operative delivery and therefore need to be identified as high risk cases and should be referred for delivery to a health centre where expert obstetrician and good operative facilities are available. This is especially important in a country like ours where majority of patients deliver at home without any antenatal care or facilities and therefore are at increased risk for obstructed labour with all its attendant morbidity & mortality. In attempting to optimize patient management and identify women at risk of LSCS, a few investigators have studied the impact of engagement of vertex at the time of active labour on LSCS rate. The present study was carried out to make an addition to the above mentioned effort.

In this case control study consisting of 300 patients much higher rates of caesarean delivery were found, 16.8 % in unengaged group compared with 5.3 % in engaged group. This is similar to study of Roshanfekr *et al*[9] in which a significant difference was found in the caesarean rate 14% for the unengaged vertex compared with 5% for the engaged group. Saropala N[10], Handa VL[11], Falzone *et al*[4], Wilkes *et al*[5], Debby *et al*[12], Murphy *et al*[13], Shin *et al*[3] and Qureshi NS[14] also found similar results in their study. Friedman and Sachtleben state that LSCS rate is 6–8 times higher in ladies with unengaged head. But contrary reports are given from the study of takahashi K[16], Briggs ND[17], Kushtagi P[18] and Diegmann *et al*[2].

The caesarean rates were higher in patients in whom Vx was at -3 or above when patient presented in early active labour: 25%, 17% and 15% respectively at -3, -2 and -1. This is similar to study of Shin *et al*[3] and Murphy *et al.*[13]

APGAR scores in unengaged group were significantly lower than engaged group. This is similar to study of Debby *et al.*[12] Sheiner carried a study on risk factors and outcome of failure to progress during the first stage of labour and reported

significantly higher rates of lower APGAR scores at 1 and 5 min as compared with the controls.[19]

Caesarean sections were mostly done for failed progress (48%) and foetal distress (24%).This is similar to study of shin *et al*[9], Murphy *et al*[13] and Friedman[20].

The mean birth weights of the newborns were significantly higher in unengaged group (p=0.0002). This is similar to study of Qureshi NS[5] which showed that foetal weight >3.5 Kg may lead to caesarean delivery in primigravidas with unengaged foetal head and of Debby *et al*[12].

The longer duration of 1st and 2nd stage of labour in my study in patients with unengaged vertex was similar to study of Murphy *et al*,[13] Kushtagi P[18]and Briggs ND[17]. Debby *et al*[12] also reported a prolonged second stage of labour 65.3±27.1 versus 54.9±30.2 min (p<0.03). The incidence of a prolonged latent phase, primary dysfunctional labour and secondary arrest of dilatation have been found to be less frequent with lower station of head at the time of active labour. Their combined incidence was found to be reduced from 20.9% at station higher than +1, to 11.4% at station lower than +1.[15]

This study has shown that most caesareans were carried out due to failed progress in unengaged group which can become obstructed labour if left unattended. It was seen that most of nulliparas in unengaged group delivered vaginally so obstetrician should keep an optimistic view while managing these patients.

CONCLUSION

Engaged vertex at the onset of active labour is associated with a lower risk of caesarean delivery in nulliparas. Patients with unengaged vertex are at higher risk for caesarean delivery due to arrest disorders, as well as lower foetal APGAR scores and higher mean birth weights of newborns.

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Address for Correspondence:

Dr. Saima Chaudhary, House #234, Sector B, Askari-10 Housing Authority, Lahore, Pakistan. **Cell:** +92-321-8487697
Email: drsaimach@gmail.com