UNENGAGED VERTEX IN NULLIPAROUS WOMEN IN ACTIVE LABOUR; A RISK FACTOR FOR CESAREAN DELIVERY

Ali F. Al-Assadi

ABSTRACT

Objective: *To compare the route of delivery among nulliparous women with & without an engaged vertex in the early, active phase of labor & to evaluate the significance of unengaged vertex in early active labor as a risk factor for cesarean delivery.* ***Setting:*** *labor room in Basra maternity hospital.* ***Design:*** *This is a prospective case- control study; the station of the fetal head was assessed among 80 nulliparous women at ≥37 weeks gestation in early, active labor (cervical dilatation ≥4 cm. with adequate uterine contractions).* ***Variables*** *were analyzed using Z-test.* ***Results:*** *among the 80 nulliparous, 36 had an engaged vertex & 44 had an unengaged vertex. The cesarean section rate for arrest disorders was significantly higher in the unengaged group (38.6%) than that in the engaged group (8.33%). 61.4% of nulliparous women with unengaged vertex had vaginal delivery. The sensitivity & specificity of unengaged vertex in nulliparous women in active labor as a test to predict cesarean section delivery were (38.6%) & (91.7%) respectively.* ***Conclusion:*** *among nulliparous parturients, an unengaged vertex is a significant risk factor for cesarean delivery but those parturients should have a trial of labor because about (61.4%) of them were succeeded in achieving vaginal delivery.*

INTRODUCTION

The term station is used to describe the level of the foetal presenting part within the birth canal in relation to the ischial spines. The foetal head is engaged when the leading edge of the head is at the level of the ischial spines[1] i.e. the foetal station is zero.[2-4] Conversely, the foetus is unengaged when the leading foetal part is above the level of the ischial spines.[2-4] Engagement has occurred in the vast majority of nulliparous women prior to labour, but not in the majority of multiparous women.[5-6] Friedman & Sachtleen[2] demonstrated that higher stations at the onset of labour were associated with an increase in the duration of labour & in the incidence of dysfunctional labour patterns. Therefore, an unengaged station in a nulliparous woman in active labour may identify the patient at risk for caesarean delivery for arrest disorders.[4] The aim of this prospective case control study was to investigate the predictive value of the foetal station at the onset of active labour to anticipate the need for caesarean delivery secondary to arrest disorders.

MATERIALS & METHODS

Assuming that the risk of caesarean delivery is 15% among engaged parturients, sample size calculations indicate that 32 participants are required in each arm to detect an increase from 15%-50% with a power of 0.80 & alpha error of 0.05. Participation was limited to those at 37 weeks or more of gestation & with singleton pregnancies with no known anomalies. Pregnant women were excluded for malpresentation or if a caesarean section was performed for any indication other than arrest disorders. The following variables were recorded: ***maternal demographics, preeclampsia, diabetes mellitus, and use of oxytocin, foetal station in early active phase, meconium-stained liquor, and chorioamnionitis. All women had estimation of neonatal birth weight at time of delivery***. The foetal station was determined in early labour. Active phase of labour was defined as cervical dilatation ≥4 with ≥ 3 contractions / 10 min.s. All parturient had intermittent foetal heart & uterine activity monitoring. Unengagement was defined as a foetal station <0 (-1 to -3). The presence of meconium was determined by visual inspection of liquor after rupture of membranes occurred. Chorioamnionitis was excluded depending on symptoms & signs. Labour was managed in the usual way with partogram record; oxytocin augmentation was used when required. Caesarean delivery was performed for arrest disorders if the patients remained without cervical advancement or without descend of the head for two hours with adequate contractions. Data were analyzed using Z-test and findings were considered significant if the P-value was <0.05. Using Unengagement as a positive test & caesarean delivery as a positive outcome, the sensitivity, specificity, and positive & negative predictive values were calculated.

Ali F. Al-Assadi, FICOG, CABOG, Department of Obstetrics and Gynaecology, College of Medicine, University of Basrah, Iraq.

RESULTS

Data on 80 participants were collected (36) of them with engaged vertex & the rest (44) with unengaged vertex at time of admission to the labour ward.

(Table-1) shows, the characteristics of women under study, the mean gestational age of women with engaged vertex is (39.13±1.75) which approximates that of women with unengaged vertex (39.59±1.4) weeks. The mean neonatal birth weight among women with unengaged vertex was (3.35±0.12) which is slightly higher than that among women with engaged vertex (3.16±0.26) but this difference was statistically not significant; and only 3 neonates in the unengaged vertex group were having body weights (4, 4.6 & 4.7) kg.

Table 1. ***Patient's characteristics.***

Criteria	Engaged (n=36)	un engaged (n=44)	P
Age of patients (mean ±SD)	23.97±1.56	24.59±1.21	NS
Gestational age (mean ±SD)	39.13±1.75	39.59±1.4	NS
Neonatal B.wt. (mean ±SD)	3.16± 0.26	3.35± 0.474	NS
Oxytocin administration	30 (83%)	38(86%)	NS

(Table-2) shows, the maternal obstetric complications; the percentages of women with preeclampsia & meconium stained liquor were higher in women with engaged vertex than those with unengaged group.

Table 2. ***Obstetrics complications.***

Complications	Engaged (N= 36)	un-Engaged (N=44)
Preeclampsia	6 (16.7%)	4 (9.09%)
Meconium	3 (8.33%)	3 (6.81%)
DM.	0	0
Chorioamnionitis	0	0
Total	9 (25%)	7 (15.9%)

(Table-3) shows, the caesarean section rate & reasons for caesarean section, one patient in each group had caesarean section for foetal distress & they were excluded from the study. The caesarean section rate for failure of descent in women with unengaged vertex (52.9%) is higher than that in women with engaged vertex (0%), it is also higher than that for arrest of cervical dilatation in the same group (47.05%). The caesarean section rate is higher among women with unengaged vertex (38.6%) compared to that among women with engaged vertex (8.3%) & the difference is statistically significant (P-value <0.05).

The specificity of nonengaged vertex in active labour to predict caesarean delivery for arrest disorders was 91.6% but its sensitivity was low (38.6%); while the positive & negative predictive values were 85% & 55% respectively.

Table 3. ***Mode of delivery.***

Mode of delivery		Engaged (n= 36)		un-engaged (n= 44)	
		No.	%	No.	%
Cesarean section	Failure of descent	0	0.0	9	20.5
	Arrest of cx. Dilatation	3	8.3	8	18.2
	Total	3	8.3	17	38.6
Vaginal delivery		33	91.7	27	61.4
Total		36	100.0	44	100.0

Sensitivity= 17/44 × 100 = 38.6%.
Specificity= 33/36 × 100 =91.7%.

DISCUSSION

Unengaged vertex in active labor in nulliparous women is a poor prognostic sign for successful vaginal delivery.[5] In this study the caesarean section rate in the control group (engaged vertex) was 8.3% which is lower than that in Basra Maternity Hospital, where the study was conducted, which is around 15% & this is probably because in this study cases delivered

by cesarean section for reasons other than arrest disorders were excluded from the study. The caesarean section rate in the unengaged vertex group for arrest disorders was significantly higher than that in the engaged group which indicates that unengagement is a significant risk factor for caesarean delivery a finding similar to that in Falzone S. et al. study.[7] In the study group 61.4% with unengaged vertex had successful vaginal delivery & only 38.6% had caesarean delivery. The sensitivity of unengaged vertex in active labor in nulliparous women as a test to predict the likelihood of caesarean delivery was low which is 38.6% only. From the above facts, although unengagement is considered to be a significant risk for caesarean delivery, those women should have a trial of labor as in most of them (61.4%) the vertex will engaged with advancing labor & vaginal delivery can occur.

In conclusion, nulliparous women with unengaged vertex in labor should have a trial of vaginal delivery although they are at higher risk for caesarean delivery compared to those with engaged vertex.

REFERRENCES

1. **Beazley JM. Natural labor & its active management. In: Whitfield G.R. (ed). Dewhurst's Textbook of Obstetrics & Gynecology for Postgraduates. Fifth edition.. Oxford. Blackwell science Ltd., 1995; 301.**
2. **Friedman EA, Sachtleben MR. Station of fetal presenting part II. Pattern of descent. Am. J. Obstet. & Gynecol. 1965; 93:522-529.**
3. **Oxorn H. The mechanism of labour. Human Labor & Birth. 4th edition. Norwalk, Connecticut, Appleton- Century- Crofts.1980; 60.**
4. **Friedman EA. Labor: Clinical Evaluation & Management. 2nd edition Norwalk, Connecticut, Appleton- Century- Crofts.1978; 37.**
5. **Chamberlain G. The mechanism of labour. Obstetrics by ten teachers, 17th ed., London, Edward Arnold, 2000: 111, 109.**
6. **Hacker NF, Moore JG. Normal Labor, Delivery & Puerperium. Essentials of obstetrics & gynecology. 3rd edition.. Philadelphia. W.B.Saunders Co. 1998; 150.**
7. **Falzone S, Chauhan SP, Mobley JA. et al. Unengaged Vertex in Nulliparous Women in Active Labor A Risk Factor for Cesarean Delivery. Journal of Reproductive Medicine. 1998; (43) 8: 676-679.**