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Comparison Of Outcome In Engaged Versus Unengaged Fetal Heads In Primigravida

Sadaf Asma[1], Sidra Tul Muntaha[2], Faiza Haq[3], Sara Hayat[4], Mona Kanwal[5]

Abstract

Objective: Our study aimed to compare the outcome of engaged versus unengaged fetal head in primigravida at term.
Methods: The study was conducted at the obstetrics & gynaecology unit, FGPC Hospital, Islamabad. The duration of the study was 6 months with a total of 130 women included & divided into two groups. Females were followed till the delivery of the fetus.
Results: A total of 130 women were observed & divided into two equal groups. The average age was 28.71 years± 6.80SD with a range of 18-43 years. Mode of delivery was measured and showed that there is a significant association between mode of delivery and unengaged fetal head in primigravida at term with p-value = 0.000. Relative risk shows that C Section was 2.93 times more in unengaged as compared to patients with engaged fetal heads.
Conclusions: The frequency of a surgical intervention is significantly higher in cases with unengaged fetal heads among primigravida at term.
Keywords: unengaged, engaged, primigravida, term

[1] Senior Registrar, Federal General Polyclinic Hospital, Islamabad; [2] Consultant Paediatrician, Cantonment General Hospital, Rawalpindi; [3,4] Medical Officer, Federal General Polyclinic, Islamabad; [5] Associate Professor, Cantonment General Hospital, Rawalpindi.
Correspondence: Dr. Sidra Tul Muntaha, Consultant Paediatrician, Paediatric Department, Cantonment General Hospital. **Email:** sidratulmuntaha1985@gmail.com
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1. Introduction

The onset of labour is characterized by progressive cervical dilatation, regular uterine contractions, effacement and descent of the presenting part.[1] Engagement of fetal head occurs when its widest diameter has fit into the pelvic inlet and it occurs by 38 weeks gestation in primigravida. Engagement also occurs between 38 and 42 weeks or even during the first stage of labour. Labor is the most important event in a woman's life with a unique experience.[2] Labor is a physiological process but at times it can be challenging to both obstetricians & women. In primigravida, normal vaginal delivery is very different than in multigravida women and this difference is because the uterus of primigravida is less efficient and hypotonic leading to a prolonged first stage of labour.[3] The results of first pregnancy and labour in terms of fetal and maternal well-being determine the future childbearing capacity of women. The success of subsequent pregnancies is largely dependent on the outcome of the first pregnancy.[4] Pregnancy and all stages of labour should be monitored in nullipara & primigravida because elderly & young women are at high risk.[5] Head is said to be engaged when its largest diameter is transverse in occiput presentation and passes through the pelvic inlet. Cephalopelvic disproportion in primigravida is labelled when the unengagement of the fetal head occurs.[4,6]

There is an old school thought that in primigravida head engagement occurs by 38 weeks. This does not happen in routine obstetrical practice. Engagement of the fetal head occurs either between 38 - 42 weeks or in the first stage of labour in most primigravida. In primigravida women, a high risk of obstructed labour is seen with the unengagement of the fetal head. The risk of caesarean delivery can be predicted from the engagement of the fetal head at the start of active labour. There is an increased risk of surgical intervention when the latent phase of labour is prolonged resulting in an increased duration of the first phase. Exposure of the mother to sepsis, ketoacidosis and obstructed labour leads to prolonged labour and at the same time fetus suffers from a high risk of perinatal asphyxia and sepsis. Dystocia is diagnosed in almost 37% of primigravida women.[4,5,7-9] Labor abnormalities nearly account for 20% of parturients.[3] Onset of active labour starts in nulliparous women when the head gets engaged & acquires a positive station which is the leading part below the ischial spine. The high head station affects

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the direction of labour in many ways. In patients with the high station, commensurate perpetuation has been observed in the latent phase of labour. The duration varies in different stages of labour & is prolonged to some extent in women having unengaged heads when compared with engaged heads.

Our study aimed to compare the fetomaternal outcomes and requirement for & surgical intervention of engaged versus unengaged fetal head in primigravida women near term. The current study will highlight that with careful monitoring of labor progress and & with timely medical intervention it could avoid caesarean section deliveries in most of the primigravida women with high heads. Further efforts must be made to find out the significant and commonest etiological factors which lead to non-engagement of the fetal head.

2. Materials & Methods

It was a cohort study with non-probability purposive sampling carried out at the Obstetrics and Gynecology unit, FGPC Hospital, Islamabad & The duration of the study was 6 months. A total of 130 patients were selected & divided into two Groups. Primigravida women between the ages of 18 to 40 years at term were divided into 2 groups after conducting abdominal examination, those with engaged fetal head per abdominal examination and those with unengaged fetal head. Patients with macrosomia (fetal weight >4kg on ultrasound), non-cephalic presentation, skeletal deformity, intrauterine growth retardation, intrauterine death, placenta previa and multiple gestations (assessed on ultrasound), previous uterine surgery, fetal distress detected on CTG by abnormal fetal heart sound are excluded from the study. The study objectives and procedures were explained informed consent was taken and the patient was reassured regarding expertise and confidentiality. Demographics like name, age, gestational age, height, weight, and BMI were noted. Fetal weight and duration of labour will also be obtained. Then females were divided into two groups, exposed and unexposed. Then females were followed up till the delivery of the fetus. If labour pains are reduced, fetal distress or abnormal CTG is observed, then females will undergo delivery through cesarean section under spinal anaesthesia. All the data were entered in a Performa—data analysed in SPSS version 22 for Windows. Mean & standard deviation were calculated for Quantitative variables like age, BMI, fetal weight and duration of labour. Frequencies and percentages were calculated for categorical variables like cesarean. 2x2 tables were generated to calculate relative risk to determine the association of cesarean section with an unengaged fetal head. RR>1 was considered as significant. Data were stratified for age, gestational age, BMI, fetal weight and duration of labour. Post-stratification 2x2 tables were generated to calculate relative risk to determine the association of cesarean section with an unengaged fetal head in each stratum. RR>1 was considered as significant.

3. Results

A total of 130 primigravida females of age 18-40 years, presenting at term were included in the study, which were divided into two equal groups. Unengaged & Engaged. Average gestational age, BMI, Fetal weight and duration of labour were compared in both groups as shown in Table 1.

Table-1 Comparison of both groups

	Group	N	Mean	Std. Deviation	p-value
Gestational Age	Engage	65	38.7846	1.09676	.070
	Unengaged	65	39.1846	1.37945	.070
BMI	Engage	65	22.5308	3.29606	.086
	Unengaged	65	21.5985	2.83998	.087
Fetal Weight	Engage	65	3.0754	.45759	.126
	Unengaged	65	2.9569	.41906	.126
Duration of Labour	Engage	65	10.3538	1.42993	.132
	Unengaged	65	10.7385	1.46070	.132

Table-2 Comparison of the mode of delivery in both groups

		Group		Total	p-value	R-Risk
		Engage	Unengaged			
Mode of Delivery	C Section	14	41	55	0.000	2.93
		21.5%	63.1%	42.3%		
	NVD	51	24	75		
		78.5%	36.9%	57.7%		
Total		65	65	130		
		100.0%	100.0%	100.0%		

Table-3 Stratification of the mode of delivery throughout labour & gestational age, fetal weight & BMI

		Mode Of Delivery	Engaged (N 65)	Unengaged (N 65)	P Value	RR
Duration of Labor(Hours)						
	<10		41(63%)	31(53%)	0.00	2.8
		Csection	10(24.4%)	21(67.7%)		
		SVD	31(75.6%)	10(32.3%)		
	>11		24(37%)	34(47%)	0.001	3.5
		Csection	4(16.7%)	20(58.8%)		
		SVD	20(83.3%)	14(41.2%)		
Gestational Age (weeks)						
	<39		43(66%)	33(51%)	0.231	1.5
		Csection	13(30.2%)	15(45.5%)		
		SVD	30(69.8%)	18(54.5%)		
	>40		22(34%)	32(49%)	0.00	17.9
		Csection	1(4.5%)	26(81.2%)		
		SVD	21(95.5%)	6(18.8%)		
Fetal weight (kg)						
	<2.5		9(14%)	11(17 %)	0.014	NA
		Csection	0(0%)	6(54.5%)		
		SVD	9(100%)	5(55.5%)		
	>2.5		56(86%)	54(83%)	0.00	2.6
		Csection	14(25%)	35(65%)		
		SVD	42(75%)	19(35%)		
BMI(kg/m)						
	<25		54(83%)	60(93%)		
		Csection	12(22.2%)	38(63.3%)	0.00	2.85
		SVD	42(77.8%)	22(36.7%)		
	>25		11(17%)	5(7%)		
		Csection	2(18.2%)	3(60.3%)	0.245	3.3
		SVD	9(81.8%)	2(40%)		

The average age observed was 28.71 years±6.80SD with a range of 18-43 years. Unengaged group had 21(35%) women in less than 25 years, 32(53.3%) women 26-35 years and 7(11.7%) women have the ages of more than 35 years. While engaged group had 24(34.3%) women in less than 25 years, 32(45.7%) in 26-35 years and 14(20%) women with age more than

35 years. The age distribution among the group was also insignificant with p-value 0.412.
Mode of delivery was noted and showed that there is a significant association between Mode of Delivery and unengaged fetal head in primigravida at term with p-value = 0.000 as shown in Table 2.
Age-wise distribution in both engaged vs unengaged shows that c-sections were low in older age. Women having less than or equal to 25 years of age have shown C-Section in 4(16.7%) in unexposed while 17(73.9%) in exposed. We can see that the mode of delivery in both the groups when stratified among the age, shows significance with the p-value mentioned in the table and high relative risk shows that age has also a significant role in the mode of delivery in women with engaged fetal heads as shown in Table 3
When the mode of delivery was stratified among the gestational age and duration of labour in hours, in both the groups it showed significance in both the groups except gestational age of less than 39 weeks as shown in Table 3.
BMI and fetal weight play a significant role in the mode of delivery in both groups. Fetal weight of more than 2.5kg has more chance of cesarean section as compared to fetal weight of less than 2.5Kg as shown in Table 3

4. Discussion

At 38 weeks of gestation fetal head engagement occurs in primigravida women & the majority of women develop full engagement during the first stage of labor or between 38 to 42 weeks. High fetal position near term in primigravida women indicates an immediate warning to the normal progression of labour either because of Cephalopelvic disproportion or due to fetal passage obstruction caused by the placenta. At the start of the active phase of labour, engagement leads to a higher risk of caesarean delivery.[10]
The results of our study showed mean birth weight of 3.01kg. El-Desouky ESAS et al [11] in their study of engaged versus unengaged fetal heads in primigravida women reported a mean birth weight of 3kg which is consistent with the findings of our study. Ashwal E et al in their study described a birth weight of 3.2 kg. [12] In a study conducted by Pahwa S et al mean birth weight was 3 kg [13] & these results are consistent with our study results.

Results of our study showed that labour duration was longer than 10 hours in 58 women of which 44.6% were having an unengaged head. A study conducted by Sirisha VS et al [08] showed that the latent phase of labour is increased in primigravida women with high heads and the mean duration of labour was 13.5 hours. This is consistent with our study findings. Badar et al in a study found that primigravida with a high fetal head duration of labour lasted more than 12 hours in the majority of women when compared to women with the engaged fetal head group.[7] Mahendra et al described the duration of Labor in unengaged women as more when compared to the engaged group with 14 & 12 hours respectively. [14] Studies conducted by Sonawane PK et al in their study reported that the mean duration of labour was shorter in the engaged than in the unengaged group. [15] In the current study total duration of labour was less in hours in the engaged group when compared to the unengaged group with a significant p-value of 0.00. In our study observation was made that etiologies regarding prolonged duration in unengaged women were mal adaptation of presenting part, the high station at the start of labour, head in deflexed position, misdirection in uterine expulsive forces, and high rate of rupture of membranes, dry labour and unsuccessful uterine contractions. These factors are consistent with the previous studies. Bibi et al in their study studied 111 cases of nullipara women with unengaged heads at term during labour. The relationship of the fetal head station with the mode of delivery was accessed & found a significant increase in the total duration of labour with a significant $P<0.01$ [16] Findings are inconsistent with our study findings. In our study, unengaged group 36.9% of women delivered vaginally and 63.1%delivered via cesarean section. In the engaged group, 78.5% of women delivered vaginally and 21.5% of women delivered by cesarean delivery. In a study conducted by Savita et al 71.82% underwent normal vaginal delivery and 17.27% underwent LSCS in the engaged group. [17] Its findings in the engaged group are consistent with our findings. Women with engaged heads had fewer cesareans when compared with women having unengaged heads. Our current study is closer to other studies conducted by Mahendra et al and Badar et al which showed lesser cesarean rates in the engaged group when compared to the unengaged group. [14, 7]. Mahendra et study find out that in the unengaged group, 63%women delivered vaginally and 37% of women delivered through cesarean, while in the

engaged group, 77% of women delivered vaginally and 23% of women delivered by cesarean. Chaudry et al reported in their comparative studies that in women with unengaged heads and engaged heads the rate of caesarean was 16.89% & 5.33% respectively.[7] Bibi et al found that higher fetal stations led to higher caesarean rates and results were statistically significant with P<0.01 [18] Failure to progress was the indication for caesarean in 48% of cases with a p-value of 0.000. The main reason for caesarean delivery in the engaged group in our study was fetal distress & poor progress of labour, whereas in the unengaged group fetal distress was a common indication. According to Aditi et al and Mahendra et al results showed that poor progression of labour was a common indication in both groups. Mahajan et al found caesarean indications were poor labour progression, fetal distress and obstructed labour in 55.56%, 37.03% and 7.41% respectively and all these studies' findings are consistent with our findings. [14, 18]

Caesarean rate in our study in unengaged was 63.1% & it was a bit high when compared to some studies. A study carried out by Haroon M et al in unengaged women found that the cesarean delivery rate was 33.34% [19]. Similar findings were observed in a study conducted in Services Hospital Lahore in Primigravida with an unengaged head at term and they found an incidence of 38% for cesarean delivery. Savita et al found that 32.73% underwent LSCS in unengaged group [17] which was less when compared to the results of our study. Hussain S et al [3] conducted a study whose results showed that the rate of caesarean section delivery was 38.8 % versus 16.2% in the unengaged & engaged groups respectively. All these results were lower when compared to our study. A possible cause of this may be that unengagement of the fetal head needed induction and there was a greater need for augmentation of labour rather than the caesarean section in our study.

Studies on this subject show that varying results occurred concerning the mode of delivery when the fetal head-engaged group & unengaged group were compared. To reduce maternal mortality and morbidity tertiary care centres with instrumental delivery facilities and caesarian sections are needed.

5. Conclusion

The frequency of surgical intervention is significantly higher in cases with unengaged fetal among primigravida at term.

CONFLICTS OF INTEREST- None

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Contributions:

S.A - Conception of study

F.H, S.H, M.K - Experimentation/Study Conduction

S.A, F.H, S.H, M.K - Analysis/Interpretation/Discussion

S.A, S.T.M - Manuscript Writing

S.T.M - Critical Review

S.T.M - Facilitation and Material analysis

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