

ORIGINAL ARTICLE

Maternal Outcome of Primigravida Patient with Term Pregnancy with Engaged Versus Unengaged Foetal Head at Onset of LabourSAMAR HUSSAIN¹, SAIMA QURBAN², HUMA TAHSEEN³, KIRAN JAVED⁴, HAFIZA NAVEEDA KHURSHID⁵¹Assistant Professor Gynaecology/Obstetrics Rashid Latif Medical College, Lahore²Assistant Professor Gynaecology/Obstetrics Rashid Latif Medical College, Lahore³Associate professor, Azra Naheed Medical College, CMA Hospital, Raiwind Road, Lahore⁴MBBS, FCPS, Consultant Gynecologist, THQ Hospital Paroa, D. I. Khan⁵Assistant Professor at Azra Naheed Medical College, CMA Hospital, Raiwind Road, LahoreCorrespondence to: Samar Hussain, Email: drsamarhussain@hotmail.com, Cell: +92 323 4426821**ABSTRACT****Objective:** To assess the maternal outcome of primigravida patient with term pregnancy with engaged versus unengaged foetal head at onset of labour**Design of the Study:** It was a cohort study.**Study Settings:** The study was conducted at Department of Obstetrics & Gynecology Rashid Latif Medical College, Lahore from January 2021 to June 2021.**Material and Methods:** This study involved 160 primigravida at term (as per dating scan) aged between 18-35 years who were divided into cases (women with unengaged fetal head) and controls (those with engaged fetal head). Outcome variable were frequency of cesarean delivery, low birth weight, poor APGAR score at 1 and 5 minutes and NICU admission which were noted and compared between the groups.**Results of the Study:** The mean age of the patients was 23.9±3.8 years while the mean gestational age was 39.0±1.3 weeks. The frequency of poor APGAR score at 1 minute (25.0% vs. 5.0%; p-value<0.001; 95%CI RR=5.00) and cesarean delivery (38.8% vs. 16.3%; p-value=0.001; 95%CI RR=2.39) was significantly higher in women with unengaged fetal head at term. However, there was no statistically significant difference between the groups in terms of poor APGAR score at 5 minutes (5.0% vs. 2.5%; p-value=0.405; 95%CI RR=2.00), NICU admission (10.0% vs. 8.8%; p-value=0.786; 95%CI RR=1.14) and low birth weight (7.5% vs. 3.8%; p-value=0.303; 95%CI RR=2.00). **Conclusion:** In the present study, unengaged fetal head at term was associated with poor APGAR score at birth and increased risk of cesarean delivery which advocates that women with unengaged fetal head at term should be considered as high risk so that anticipated management may improve the fetomaternal outcome**Keywords:** Primigravida, Unengaged Fetal Head, Fetomaternal Outcome**INTRODUCTION**

The birth of a child is a life-changing event that only occurs once in a woman's lifetime. Once regular contractions begin, dilation and effacement begin to occur, followed by part's descent. When the broadest diameter of the fetus's head fits into the pelvic inlet, the fetus is said to be engaged. Obstetricians have long held the belief that the fetus's head is engaged by 38 weeks gestation in a first-time mother. Nearly all pregnancies end in marriage between the ages of 38 and 42 weeks.^{1,2,3}

Fetal skull biparietal diameter passing through the pelvic entrance has been classified as engagement.^{4,5} A high head at term in a first-time mom is a bad omen. Even though it is commonly thought of as a sign of labour, the engagement of the foetal head is actually proof positive that the pelvic inlet is large enough to accommodate the foetus.⁵ Operative birth is more likely when the foetal head fails to engage in early labour.^{6,7}

Cephalopelvic disproportion can manifest as a high head in primigravida, and this has long been suspected. At term, a high foetal head in a first-time mother is considered a risk factor for obstructed labour and dystocia. As a result, the number of caesarian sections has risen, putting pressure on women's finances and limiting their ability to have more children in the future.⁸ A higher likelihood of a caesarean section is associated with non-engagement at the start of the active phase of labor.⁹

Studies show that LSCS should not be used exclusively in primigravida who are at term and have an unengaged head at the beginning of labour. Vaginal delivery can be achieved with the least amount of harm to both the foetus and the mother by keeping a vigilant outlook and employing suitable intervention methods. Fetal outcome with respect to APGAR score at 5min has been recorded quite well in different studies like a study conducted by Sudhir S it was found that 65% of the deliveries were vaginal and in 67.5% cases, the fetus had APGAR score of (>7), only 8.33% babies required NICU admission¹⁰.

In another case control study comparing pregnancy outcome in terms of delivery in a first-time mother with an engaged foetal head versus an unengaged head at term it was found that 39%

women in unengaged fetal head group and 19% in engaged fetal head group delivered with cesarean section, and 65% and 42% women in engaged versus unengaged fetal head groups had spontaneous vaginal delivery¹¹.

When the fetus's head is not engaged at the start of labour, primigravida are at a significant risk of experiencing obstructed labour. In some circumstances, labour is extended, and more care may be needed in the event of a medical emergency. A variety of research has shown that foetal head engagement and non-engagement have different effects on delivery method and outcome.^{12,13,14} There is only a small amount of information accessible in our country about the long-term effects of a foetal head that has not been engaged. Since the purpose of this study is for us to learn more about how pregnant women with engaged foetal heads and unengaged heads fare in our study group in terms of their APGAR scores, we've decided to conduct it.

MATERIAL AND METHODS

After taking permission of IRB, the study was conducted at Department of Obstetrics & Gynecology Rashid Latif Medical College, Lahore from January 2021 to June 2021.

When the projected caesarean delivery rate for women with an unengaged foetal head is 39.0 percent, a sample size of 160 cases (80 cases in each group) was determined using an 80% power of test and a 5% significance level. Non-Probability, Consecutive Sampling chose seven patients. Primigravida women with full term gestation (having 38 - 42 weeks of gestation) and in exposed group exposed fetal head women and in un-exposed group normally engaged fetal head women were included. Multigravida women having intrauterine growth restriction, previous uterine surgery or history of abortion or primi with medical complications like diabetes mellitus and hypertension were excluded from the study to control the biasness.

During this study, a total of 160 pregnant women who met the inclusion criteria were recruited. After receiving approval from the hospital's ethics committee, the study began. The study included women who were admitted to the gynaecology

department for labour and delivery with or without an engaged foetal head. The primigravida with a singleton cephalic presentation and an unengaged foetal head who arrived in the labour department either as an emergency or as a scheduled case was taken into consideration. Free-floating heads were favoured over those with fixed ones. In addition, the cases in which the head was not actively engaged, that is, above the brim, were also included in the exposed group. Women who had a naturally engaged foetal head were included in the group that was not exposed. Informed written consent was obtained from each patient after a brief explanation of the study's purpose.

For all participants in the study, the length of the active phase of labour, medical interventions such as the use of oxytocin and prostaglandin, surgical interference, foetal and mother outcomes were observed. On examination of abdomen (Crichtons method) or 2nd pelvic grip, the foetal head was termed unengaged if more than 2/5th of the foetal head was palpable and/or both poles of the foetal head (i.e., sinciput and occiput) were palpable. Ultrasound was used to make the diagnosis.

Patients were treated in accordance with the consultant's recommendations, which were made in light of the results of the physical examination and CTG. The APGAR score, birth weight, and need for NICU hospitalisation were all assessed at 1 minute and 5 minutes (i.e. low APGAR score 7). A pre-designed proforma was used to record all of this information as well as demographics such the woman's name, age, parity, and gestational age (as determined by the date of her last menstrual period and an ultrasound).

SPSS version 16.0 was used to enter and evaluate all of the gathered data. The mean and standard deviation (SD) were used to present the data on age and gestational age. Data on the frequency and percentage of variables such as mode of delivery, APGAR score at 1 and 5 minutes, and birth weight (low and normal birth weight) have been reported. Exposed and unexposed groups have been compared using Chi-square tests to examine the frequency of mode of delivery, poor APGAR scores (7), low birth weights (2.5 kg), or NICU admissions. The relative risk (RR) has been estimated for each group. To account for impact modifiers, data were stratified by age and gestational age. Prior to stratification, Chi square tests were performed with p0.05 as the cutoff, and the RR was revised.

STUDY RESULTS

This study included women aged 18 to 35, with a mean age of 23.9 years, and a gestational age of 39.0 weeks, on average, as indicated in Table 1. Table 2 shows that the mean age (p-value=0.724), the mean gestational age (p-value=0.906), and the distribution of various age (p-value=0.854) and gestational age (p-value=0.858) groups in both study groups were comparable.

The frequency of poor APGAR score at 1 minute (25.0% vs. 5.0%; p-value<0.001; 95%CI RR=5.00) and cesarean delivery (38.8% vs. 16.3%; p-value=0.001; 95%CI RR=2.39) was significantly higher in women with unengaged fetal head at term. However, there was no statistically significant difference between the groups in terms of poor APGAR score at 5 minutes (5.0% vs. 2.5%; p-value=0.405; 95%CI RR=2.00), NICU admission (10.0% vs. 8.8%; p-value=0.786; 95% CIRR=1.14) and low birth weight (7.5% vs. 3.8%; p-value=0.303; 95%CI RR=2.00) as shown in Table 3. Similar difference was observed across various subgroups of patients based on patient's age and gestational age as shown in Table 4.

Table 1: Demographic details of enrolled patients

Parameters	Subgroups	Participants n=160
Age (years)	18-26 years	121 (75.6%)
	27-35 years	39 (24.4%)
	Mean±SD	23.9±3.8
Gestational Age (weeks)	38-39 weeks	117 (73.1%)
	40-42 weeks	43 (26.9%)
	Mean±SD	39.0±1.3

Table 2: Characteristics at baseline of study groups

Parameters	Characteristics	Unengaged Fetal Head	Engaged Fetal Head	P-value
Age (years)	Mean±SD	23.8±4.0	24.0±3.6	0.724
	18-26 years	60 (75.0%)	61 (76.2%)	0.854
	27-35 years	20 (25.0%)	19 (23.8%)	
Gestational Age (weeks)	Mean±SD	39.01±1.41	39.04±1.26	0.906
	38-39 weeks	59 (73.8%)	58 (72.5%)	0.858
	40-42 weeks	21 (26.2%)	22 (27.5%)	

Chi-square test and Independent sample t-test, observed difference was statistically insignificant

Table 3: Comparison of poor APGAR at 1 minute, poor APGAR at 5 minute, NICU admission, low birth weight, cesarean delivery between the Study Groups

Parameters	Study Groups	Poor APGAR at 1 minute		Total	P-value	RR 95% CI
		Yes (n=24)	No (n=136)			
Poor APGAR at 1 minute	Unengaged Fetal Head	20(25.0%)	60(75.0%)	80(100%)	<0.001*	5.00
	Engaged Fetal Head	4(5.0%)	76(95.0%)	80(100%)		
Poor APGAR at 5 minute	Unengaged Fetal Head	4(5.0%)	76(95.0%)	80(100.0%)	0.405	2.00
	Engaged Fetal Head	2(2.5%)	78(97.5%)	80(100%)		
NICU Admission	Unengaged Fetal Head	8(10.0%)	72(90.0%)	80(100.0)	0.786	1.14
	Engaged Fetal Head	7(8.8%)	73(91.2%)	80(100.0)		
Low Birth Weight	Unengaged Fetal Head	6(7.5%)	74(92.5%)	80(100.0%)	0.786	1.14
	Engaged Fetal Head	7(8.8%)	73(91.2%)	80(100%)		
Cesarean Delivery	Unengaged Fetal Head	31(38.8%)	49(61.2%)	80(100.0%)	0.001*	2.39
	Engaged Fetal Head	13(16.3%)	67(83.7%)	80(100%)		

Chi-square test, * observed difference was statistically significant; RR= Relative Risk, 95% CI= 95% Confidence Interval

Table No 4: Comparison of Poor APGAR at 1 minute between the Study Groups across Various Age Groups

Parameters	Study-groups	Study Groups	Poor APGAR at 1 minute		Total	P-value	RR 95% CI
			Yes (n=24)	No (n=136)			
Poor APGAR at 1 minute	18-26 years	Unengaged Fetal Head	15(25.0%)	45(75.0%)	60(100.0%)	0.002*	5.08
		Engaged Fetal Head	3(4.9%)	58(95.1%)	61(100.0%)		
	27-35 years	Unengaged Fetal Head	5(25.0%)	15(75.0%)	20(100.0%)	0.088	4.75
		Engaged Fetal Head	1(5.3%)	18(94.7%)	19(100.0%)		
Low Birth Weight	18-26 years	Unengaged Fetal Head	4(6.7%)	56(93.3%)	60(100.0%)	0.391	2.03
		Engaged Fetal Head	2(3.3%)	59(96.7%)	61(100.0%)		
	27-35 years	Unengaged Fetal Head	2(10.0%)	18(90.0%)	20(100.0%)	0.579	1.90
		Engaged Fetal Head	1(5.3%)	18(94.7%)	19(100.0%)		
Cesarean Delivery	18-26 years	Unengaged Fetal Head	23(38.3%)	37(61.7%)	60(100.0%)	0.007*	2.34
		Engaged Fetal Head	10(16.4%)	51(83.6%)	61(100.0%)		
	27-35 years	Unengaged Fetal Head	8(40.0%)	12(60.0%)	20(100.0%)	0.093	2.53
		Engaged Fetal Head	3(15.8%)	16(84.2%)	19(100.0%)		

Chi-square test, * observed difference was statistically significant; RR= Relative Risk, 95% CI= 95% Confidence Interval

DISCUSSION

The objective of this study was to compare fetomaternal outcome of exposed with unexposed fetal head in primigravida women presenting at term pregnancy.

In women with an unengaged foetal head at term (38.8% vs. 16.3%; p-value=0.001; 95 percent confidence interval RR=2.39), the rate of caesarean birth was considerably greater. As Iqbal et al.¹⁵ also found, there was a significantly greater rate of C-section in women with an unengaged foetal head at term (38.0% vs. 15.0%; P0.001), which is in keeping with our findings. It has been found that women who have an unengaged foetal head are more likely to have a caesarean section than those with an engaged foetal head (39.0% vs. 19.0%; p0.05). Ali et al.¹⁶ found a similar difference in the need for surgical delivery in Iraqi women with unengaged versus engaged foetal heads at term (38.6 percent vs. 8.3 percent; p-value0.001).

According to the results of this study, women with unengaged foetal heads at term were shown to have a greater rate of low APGAR scores at one minute (25.0 percent vs. 5.0 percent; P-value0.001; 95 percent CI RRR=5.00). A similar percentage of neonates born to moms with unengaged foetal heads had a low APGAR at one minute, as reported by Shaikh et al.⁴ (2014), at PUMHS, Nawabshah. Similar frequency of 22.0% has been reported by Khurshid et al.⁵ (2012) at Lady Willingdon Hospital Lahore. Aashita et al.¹⁷ (2017) and Ravalji et al.¹⁸ (2016) observed similar frequency of poor APGAR score at 1 minute in Indian newborns of mothers with unengaged fetal head at term and reported it to be 24.0% and 26.0% respectively.

In the present study, poor APGAR score at 5 minutes was observed in 5.0% of newborns of mothers with unengaged fetal head at term. Our observation is in line with that of Mahendra et al.² (2014) who reported the frequency of poor APGAR score to be 10.0% at 5 minutes after birth among Indian such neonates. Similar frequency of 6.5% has been reported in another Indian study by Ambwani et al.¹⁹ in 2003.

We observed that NICU admission was required in 10.0% of neonates of women with unengaged fetal head at term which was only insignificantly higher than neonates of women with engaged fetal head at term (8.8%). Iqbal et al.⁸ (2009) reported similar insignificantly higher frequency of NICU admission in neonates of women with unengaged versus engaged fetal head at term (10.0% vs. 9.0%; p-value>0.05). Shaikh et al.⁴ (2014) reported similar frequency of 10.0% for NICU admission among such neonates at Peoples University of Medical and Health Sciences, Nawabshah. Aashita et al.¹⁷ (2017) reported similar frequency of NICU admission (10.0%) among Indian newborns of mothers with unengaged fetal head at term. Slightly higher frequency of 16.0% has been reported in another Indian study by Sadiq-Unnisa et al.²⁰ in 2019.

The present study adds to the limited existing research evidence on the topic. In the present study, unengaged fetal head was associated with poor APGAR score at birth and increased risk of cesarean delivery which advocates that women with unengaged fetal head at term should be considered as high risk so that anticipated management may improve the fetomaternal outcome.

A very important limitation to the present study was that we didn't consider the various other important maternal outcome measures like perineal tear, PPH and mortality. Also we didn't consider various underlying causes of failure of fetal head engagement particularly in relation to the fetomaternal outcome which could have helped in the risk stratification and management

planning of such cases. Such a study is highly recommended in future research.

CONCLUSION

In the present study, unengaged fetal head at term was associated with poor APGAR score at birth and increased risk of cesarean delivery which advocates that women with unengaged fetal head at term should be considered as high risk so that anticipated management may improve the fetomaternal outcome.

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