

## Outcome of Unengaged Fetal Head at Term in Nullipara

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### ABSTRACT

**Introduction:** Engagement of fetal head is usually regarded as a phenomenon of labor in nullipara. It commonly occurs during the last few weeks in nullipara, in majority by 38 weeks or even during the first stage of labor. The aim of this study was to determine the outcome of unengaged fetal head at term in nullipara.

**Materials And Methods:** This study was conducted at obstetrics and gynecology unit, tertiary care teaching hospital, Peshawar. This was a descriptive cross-sectional study which was conducted during 12<sup>th</sup> Jan 2021 to 10<sup>th</sup> April 2022, in which a total of 111 patients were included in the study using 16.89% proportion of caesarean section, 95% confidence level and 7% margin of error under WHO software for sample size determination.

**Results:** In this study, patients were in age range 19-35 years and heights of the patients were 140-160cm. Among 111 patients, normal vaginal delivery occurred in 71.71% patients, instrumental delivery in 10.8% and 18.2% patients underwent low segment caesarean section. Total number of nullipara with unengaged head were divided into four groups based on fetal head station in early labor. Total number of nullipara in each group of which 30.6% were free head, 43.2% at -3 station group, 21.62%-2 station group and 45% in -1 group

Practical implication in nulliparous patients a high station at the onset of labour is not necessarily an ominous finding, even though the incidence of arrest disorders are higher when station is -3, or floating, obstetricians can still be optimistic towards vaginal delivery.

**Conclusions:** Nullipara with unengaged head at term during labors should be regarded with suspicion and as such should be regarded with apprehension in labor. Dysfunctional labor occurs in only small proportion of patients with unengaged head. It is concluded that the incidence of active surgical intervention in nullipara with unengaged fetal head at term is quite high.

**Keywords:** Primigravidae, engagement of head, delivery, LSCS, Head station.

### INTRODUCTION

Engagement of fetal head is usually regarded as a phenomenon of labor in nullipara. It commonly occurs during the last few weeks in nullipara, in majority by 38 weeks or even during the first stage of labor<sup>1</sup> (1) When it does so, is confirmatory evidence that the pelvic inlet is adequate for the fetal head (2). Engagement is said to have occurred when the widest diameter of the fetal head has passed beyond the pelvic inlet (3). It is seen that the nulliparous woman with floating head demonstrates higher rate of caesarean section than those with dipping or engaged head in early labor (4). According to an international study the incidence of unengaged head in primigravida is 31% and no cause of unengagement is found in 46% of the cases (5). The frequency of unengaged head in Pakistani primigravida is 2% at 36 weeks and in labor 20.3% had head engaged (6). Un-engagement of fetal head in primigravida has long been considered as a possible sign of cephalopelvic disproportion associated with prolonged first and second stage of labor in 66% of the cases due to improper adaptation of the fetal head, high station and misdirection of uterine expulsive forces. Thus, the total duration of labor also increases significantly (7). According to an international study, the rate of caesarean section is 17.1% in women with unengaged head at term with 82.9% delivering vaginally (8). A local study shows rate of caesarean section to be 16.89%, instrumental delivery as 22.97% and vaginal delivery as 60.14% in the unengaged head compared to 5.33% caesarean section rate, 18.67% instrumental delivery and 76% vaginal delivery in the engaged group, where most of the caesarean carried out for failed progress of labor (48%) (9). Nullipara with unengaged head is at substantially high risk of operative delivery. The objective of my study is to enumerate the outcome of labor in nulliparous women with unengaged head at term and compare it with those who present with engaged head. The diagnosis of engagement of fetal head is mandatory before operative vaginal delivery is attempted (10). The purpose of my study is that such cases should be identified as high risk and should be referred for delivery to a health care center where expert obstetrician and good operative facilities are available. With proper monitoring and maintenance of partogram, especially when no etiological factor is found, vaginal

delivery is possible in majority with minimal fetomaternal morbidity [(11,12)].

### MATERIALS AND METHODS

This study was conducted at obstetrics and gynecology unit, tertiary care teaching hospital, Peshawar. This was a descriptive cross-sectional study which was conducted during 12<sup>th</sup> Jan 2021 to 10<sup>th</sup> April 2022, in which a total of 111 patients were included in the study using 16.89% proportion of caesarean section, 95% confidence level and 7% margin of error under WHO software for sample size determination. All primigravida with cephalic presentation and estimated fetal weight of 2.5 -4kg with or without labor with BMI of 26 were included in the study. Those with skeletal deformity detected clinically, intrauterine growth retardation, previous uterine surgery, placenta previa and multiple gestation, detected on ultrasound and Primigravida who presents with fetal distress detected either by abnormal fetal heart sound detected by per abdominal auscultation Approval from the medical ethics committee of the hospital were taken for the study. Patients were admitted in Gynae B unit through labor room, casualty or OPD. The study objectives and procedures were explained, and informed written consent were taken and the patient reassured regarding expertise and confidentiality. Detailed history was taken. Height was recorded in centimeters and weight was recorded in kilograms. From these reading BMI were calculated and BMI of 26 were taken as a cut off value for comparison between the two groups. Duration of gestation were estimated according to patients last menstrual periods if they are sure about the date and had regular menstrual cycles or calculate from first trimester ultrasound. The abdominal and vaginal examination of all the groups was done to find the station of fetal vertex. Pelvic configuration was assessed by clinical pelvimetry. Duration of all three stages of labor was seen in terms of the number of vaginal, instrumental or caesarean delivery. All the data were entered in a Performa. Those with unengaged head were placed in group A and those with engaged head were placed in group B. Course of labor were plotted on a partograph.

Data were analyzed in SPSS version 10 for windows. Mean±standard deviation was calculated for Quantitative variables like age. Frequencies and percentages were calculated

for categorical variables. Chi square test were applied to compare the information in both groups. P-value < 0.05 were considered as significant. Results were stratified among age to see the effect modification. All the results were presented in the form of tables and graphs.

## RESULTS

The present study cases studied were between 19-35 years and height of the patients were between 140-160 cm. Total number of nullipara with unengaged head were divided into four groups based on fetal head station in early labor. Total number of nullipara in each group of which 30.6% were free head, 43.2% at -3 station group, 21.62%-2 station group and 45% in -1 group. (Table 2) Average duration of 1<sup>st</sup> stage of labour in free fetal (FF) group was 13-hour 13 min and average duration of second stage was 46 min. in the -3-station group, duration of 1<sup>st</sup> stage average was 11 hr 22 min average duration of second stage was 31 min. the average total duration of labour is 12-hour 6 min. In the -2-station group, 1<sup>st</sup> stage average being 10 hr 31 min, average duration of second stage was 28 min. Average total duration of labour was 11-hour 6 min. in the -1-group 1<sup>st</sup> stage average was 8 hr 2 min. second stage was 26 min. and total duration 8 hr 34 min. (Table 3) Out of 111 cases, 79 cases (71.17%) had normal vaginal delivery. 10.81% had instrumental delivery and 18.02% had underwent lower segment caesarean section. According to chi-square test  $p < 0.01$  which is statistically significant. (Table 4) Indication for instrumental delivery varied in prolonged second stage and fetal distress. More number of instrument delivery was noted with ventouse delivery (10 cases) than with outlet for ceps (2 cases). (Table 5) Majority of cases indicated for low segment caesarean section were failure to progress (70%) and in 30 %, it was fetal distress. (Table 6). Combing operative deliveries as instrumental and LSCS, the mean operative deliveries due to failure to progress were 64.16% and due to fetal distress were 35.84% (Table 7) Outcome was stratified among the age and BMI and found that the both were insignificant statistically. (Table 8)

Table 8: Stratification Over Age And Bmi

			Outcome			Mean+SD	p-value
			C Section	NVD	Instrumental		
Age (in years)	<= 25.00	Count	17	69	11	21.67+3.47SD	0.8712
		Row N %	17.5%	71.1%	11.3%		
	26.00+	Count	3	9	2		
		Row N %	21.4%	64.3%	14.3%		
BMI	<= 23.00	Count	15	55	10	22.41+2.32SD	0.8473
		Row N %	18.8%	68.8%	12.5%		
	24.00+	Count	5	23	3		
		Row N %	16.1%	74.2%	9.7%		

## DISCUSSION

We studied 111 cases of nullipara at term attending labor room. Of 111 cases, 34 cases free floating head, 48 cases vertex at -3 station, 22 cases head -2 station and 5 cases had -1 station at the onset of labor [(13-15)]. In the present study, we evaluated the relationship of the fetal head station at the onset of labor with progress of labor. The mean duration of I, II stage and total duration was longer in higher foetal station [(16)], i.e., FF and -3 compared to lower foetal station -2, -1 station  $p < 0.01$  statistically significant. When compared to Kaur et al. (2000) and Friedman et al. (1965) the duration of I, II and total duration of labor was more than the present study. In Chaudhary et al [(17)]. (2009) duration of 1<sup>st</sup> stage was 11.04±2.09 hr and 2<sup>nd</sup> stage was 37.8 ±20.3 min and according to Salma Iqbal (2009) total duration prolong to >12 hrs in 66% of cases of unengaged head and in Am, bwani BM (2004) study 64% of cases labor lasted more than 12 hours [(18,19)]. In the present study there was significant increase in I, II stages and total duration with high foetal head station when compared to lower

Table 1: Case Distribution According To Fetal Head Station

Group	Number of cases	Percentage
-3	34	30.6%
-2	48	43.2%
-1	24	21.62%
Total	5.9	4.5%

Table 2: Average Duration Of Labor

Group	1 <sup>st</sup> stage (hr)	2 <sup>nd</sup> Stage (min)	3 <sup>rd</sup> Stage (min)	Total Duration (hr-min)
FF	12.2	46	7.3	13.13
-3	11.22	31	7.5	12.06
-2	10.31	28	7.03	11.06
-1	8.02	26	6	8.34

Table 3: Mode Of Delivery

	Frequency	Percentage
Normal vaginal delivery	79	71.17
Instrumental delivery	12	10.81
Low segment C section	20	18.02
Total	111	100.00

Table 4: Indications For Instrumental Delivery

Indication	No. of cases	Percentage
Failure to progress	7	58.33%
Fetal distress	5	41.67%

Table 5: indications for low segment c section:

Indication for LSCS	No. of cases	Percentage
Failure to progress	14	70%
Fetal distress	6	30%

Table 6: Means For Operative Delivery

Failure to progress	64.16%
Fetal Distress	35.84%

Table 7: Means for Operative Delivery

Failure to progress	64.16%
Fetal Distress	35.84%

station. In the present study 71.171 had normal vaginal deliveries, 18.02% deliveries by LSCS and 10.81% instrumental deliveries [(20)]. The present study compared to kaur Det et al, Fielder M et al, Chaudhry et al, rate of caesarean section is comparable and statistically significant. This study was carried out on two hundred primigravidas, 100 with unengaged head and 100 with engaged fetal head attending labour room from July 2008 to December 2008. In our study the most common cause for unengaged fetal head at term or onset of labour was deflexed head followed by cephalopelvic disproportion, loops of cord around the neck, prelabour rupture of membranes, hydrocephalus and polyhydramnios. No cause was found in majority of the women i.e. 46%. The duration of latent and active phase of labour was significantly increased in women with unengaged fetal head (66% vs 26%) due to improper adaptation of presenting part, deflexed head, misdirection of uterine expulsive forces, early rupture of membranes and ineffective uterine contractions. These results were consistent with the study conducted by Ambwani et al.<sup>3</sup> The

rate of caesarean section was 38% in women with unengaged head vs 15% in women with engaged head in our study. These results were consistent with the results of many studies.<sup>3,6,9,10</sup> Ambwani et al stated that the rate of caesarean section was 34% in women with unengaged head at term but according to Debby<sup>2</sup>, 82.9% of women with unengaged head delivered vaginally and 17.1% had a caesarean section which was quite less than our rate but it was 4 times their control rate of 4.2%. Majority of women in engaged group presented in spontaneous labour (78% vs 41%) and majority of women in unengaged group had induction of labour at 41 weeks (59% vs 22%). There was greater need for augmentation with oxytocin in women with unengaged group (72% vs 33%). According to a study done by Saqib et al<sup>11</sup> the single most important predictor for vaginal delivery in women with unengaged head was natural onset of labour and this was seen in our study where 95% women with unengaged head who presented with spontaneous onset of labour had a vaginal delivery. Thus women with unengaged head should be induced cautiously and with counseling for increased need for caesarean section. There was no significant difference in the maternal and neonatal morbidity between the two groups although it was slightly higher in the unengaged group. There were no serious maternal complications except third degree perineal tear

## CONCLUSIONS

Nullipara with unengaged head at term during labor should be regarded with suspicion and apprehension. Dysfunctional labor occurs in only small proportion of patient with unengaged head. The incidence of active surgical intervention in nullipara with unengaged total head at term or the onset of labor is quite high.

**Conflict of Interest:** None.

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## REFERENCES

1. Yeo L, Romero R. Sonographic evaluation in the second stage of labor to improve the assessment of labor progress and its outcome. *Ultrasound obstet gynecol.* 2009; 33(3): 253-8
2. Mishra R. Management of labor. 6<sup>th</sup> ed. In: *Practical obstetric problems*, Ian Donald s,ed. New Delhi: BI Publications Pvt Ltd 2007; pp. 506-21.
3. Prapas N, Kalogiannidis I, Masoura S, Diconanti E, Makidos A, Drossou D, et al. Operative vaginal delivery in singleton term pregnancies: short term maternal and neonatal outcomes. *Hippokratia.* 2009; 13 (1):41-5.
4. Mahendra G. Clinical study of unengaged head in primigravida at term in labor [online]. [cited on April,2011]. Available at <http://119.82.96.198:8080/JSPUI/hande/123456789/4939>.
5. Expected pathways of care for pregnant women. Guidelines for consultation and collaborative maternity care planning [online]. [cited on march, 2012]. Available at <http://www.easternhealth.org.au/appcmslib/media/umlib/maternity/guidelines%20for%20consultation%20and%20collaborative%20maternity%20care%20planning%2021st%20march%202012.pdf>
6. Jafarey SN. Unengaged fetal head in Pakistani primigravida: frequency and outcome. *J obstet gynecol Res.* 2010; 14 (1): 13-6 7,8-page 82.
7. Chaudhry S, Farrukh R, Dar A, Humayun S. Outcome of labor in nullipara at term with unengaged vertex. *J Ayub Med Coll Abbotabad.* 2009; 21(3): 131-4.
8. Friedman EA, satcht leben Mr. station of fetal presenting part I patten rod descent. *Am J of Obst and Gyne* 1965; 93:530-6.
9. Auer SE, Simmons MJ. The floating fetal head in primiparaatterm. *AmJ of Obst&Gynec*1949; 58:291-8.
10. Khurshid N, Sadiq F. Management of primigravida with unengaged head at term. *PJMHS [online].* [ cited on march, 2012]. Available at <http://pjmhsonline.com/Janmarch2012/managementofprimigravidawith.htm>.
11. Iqbal S, Sumaira S. Outcome of Primigravida with unengaged versus engaged fetal head at term or onset of labor. *Biomedica.* 2009; 25: 159-62
12. Calkins LA. The second stage of labor – the descent phase; 1944. pp. 798-805.
13. Louis Burke, Rubin WH, Berenberg AI. The significance of the unengaged vertex in a nullipara at thirty-eight weeks gestation. *Am J of Obst & Gynec* 1958; 76:13-6.
14. Morris Salzman, Colburn WD, Douglas WG. Significance of engagement of the fetal head in Puerto Rican primiparas. *Am J of Obst & Gynec* 1960; 79:1103-6.
15. Leela Chogtu, Wazira Khanum. Labour in primigravida with unengaged vertex heads. *Journal of obstetric and Gynecology of India* 1997;27(3):329-32.
16. Swadesh Sharma, Kaur IS. Engagement of Fetal head in primigravidae and its relationship to period of gestation and time of onset of labour. *Journal of Obstetrics and Gynecology of India* 1978;410-2.
17. Ali F, AL-Assadi. Unengaged vertex in nulliparous women in active labor, a risk factor for caesarean delivery. *The medical Journal of Basrah University* 2005; 23 (1): 18-20.
18. Meenakshi Saikia, Gogoi MP. Relationship of time of engagement of head in primipara with spontaneous onset of labour. *Journal of Obstetrics and Gynecology of India* 1987;777-80.
19. Prahlad Kushtagi, Dhall GI, Dhall K. Pattern of cervical dilatation in normal labour. *Journal of obstetrics and Gynecology of India* 1989;601-5
20. Kang M. Kaur D. effect of fetal station at the onset of labor on cervimetric progress in primigravida. *Journal of obstetrics and gynecology of india* 2000;50(30):42-4.