

# “How Short Is Too Short “– Comparison Of Maternal Height With Delivery Outcome

## *Labour outcome in Short stature pregnancies*

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**Abstract: Introduction:** In developing country like us, short stature and its complications constitutes major risk factor for maternal morbidity and mortality. Literature shows only few studies related to this. Hence we wanted to share our experience about short stature in our institution **Aims & Objectives:** To assess the outcome of labor and complications among short stature women in Joseph nursing home **Materials and Methods:** The study was an retrospective analysis over a period of one year (Oct 2017- Oct 2019) which included all pregnant women delivered during this period, excluding early preterm deliveries <34weeks. **Results:** Among the total number of deliveries in short stature woman, 63% constituted for spontaneous vaginal deliveries in the short stature group, irrespective of parity with maximum number of average size babies between 2.6-3.0Kgs(65% in primi, 35% in multi) which is relatively high compared to the literature. **Conclusion:** Contracted pelvis is a rare entity nowadays. Cephalopelvic disproportion should be assessed when the patient is in active labor, individualizing each and every patient. Hence every woman should be given trial of labor irrespective of stature.

**Keywords—Short stature, Labor outcome, Cephalopelvic disproportion, Trial of labor**

### Introduction:

Maternal height distribution is varied among different geographic or ethnic groups[1]. Short stature is defined as height below 3<sup>rd</sup> percentile or more than 2SD below the median height for age & gender. As obstetricians we are all aware that there is distinct correlation between the height of the pregnant woman and the diameter of the pelvis, which in turn has the significance on the reproductive potential [2]. Numerous studies in the literature have shown that shorter maternal height and greater fetal weight are

associated with increased delivery complications [3]. The odds of having been born of a mother of short stature are more than three times greater for a low birth weight baby than a normal weight baby [4]. Although number of studies in the literature have reported a correlation between maternal height and the risk of caesarean section, some authors failed to find any association between maternal height and the mode of delivery[5,6]. Therefore, the present study was aimed to investigate the relationship between maternal stature, pregnancy outcome and the mode of delivery.

### Materials and Methods:

This was a retrospective observational study done over a period of 2 years in Joseph hospitals, Chennai with a total of 2731 pregnant woman. Data's were collected from digital patient records. The study population were divided into three groups - ≤150cms (4.11 ft), 151-160cms(5-5ft3in), >160cms(>5ft3in). We included all woman delivered during this period including all medical co-morbidities, except preterm deliveries <34weeks. Our major outcomes were to estimate the onset and duration of labour, mode of delivery, weight of the baby and maternal and neonatal complications. The objective of the study were to compare the association of maternal height with the progress of labour and the obstetric outcome and also to assess the maternal and neonatal complications among the groups.

### Results:

Of the 2931 patients recruited for the study, Considering the cut off value of short stature as 150cms in our institution, the study population were divided into three groups - ≤150cms(4.11 ft), 151-160cms(5-5ft3in), >160cms(>5ft3in) with a total number of 289, 1573 and 869 in each group respectively.

**Table 1: Demographic details of the study groups**

Variables	≤150cms (n-289)	151-160cms (n-1573)	>160cms(n-869)
Age	28.4	27.8	27.4
BMI	28.6	26.7	26.5
Parity – Primi-	179 (61.9%)	1015 (64.5%)	575 (66.2%)
Multi-	110 (38.1%)	558 (35.5%)	294 (33.8%)

GA –34-37wks	28 (9.7%)	106 (6.7%)	53 (6.1%)
37-40wks	229 (79.2%)	1201 (76.4%)	647 (74.5%)
>40wks	32 (11.1%)	266 (16.9%)	169 (19.4%)

Age and parity distribution were almost equal in all the three groups. Body mass index was slightly higher in the short stature group (28.6). Late Preterm deliveries also were higher in the short stature group (9.7%) while post term deliveries were higher in the tall stature group (19.4%).

**Table 2: Medical disorders in Pregnancy**

Disorders	≤150cms(n-289)	151-160cms (n-1573)	>160cms(n-869)
Anaemia	19 (6.5%)	81 (5.1%)	38 (4.4%)
Gestational Diabetes Mellitus	55 (15.2%)	160 (10.2%)	81(9.3%)
Overt Diabetes	9 (3.1%)	44 (2.8%)	17 (2%)
Pregnancy induced Hypertension	28 (9.7%)	148 (9.4%)	63 (7.2%)
Impaired Glucose tolerance	23 (8%)	82 (5.2%)	42 (4.9%)
Hypothyroid	11 (3.8%)	66 (4.2%)	38 (4.4%)

All the medical co-morbidities were higher in the short stature group compared to other two groups, may be due to the increased body mass index in the same group.

**Table 3: Progress of Labour**

Onset	≤150cms(n-289)	151-160cms(n-1573)	>160cms(n-869)	p Value
Onset -Spontaneous	112(38.8%)	731(46.5%)	388(44.6%)	0.0001
Induced	138(47.8%)	716(45.5%)	425(48.9%)	
Duration <24hrs	212(84.1%)	1237(85.4%)	715(87.8%)	0.181
>24hrs	40(15.9%)	211(14.6%)	99(12.2%)	
Oxytocin Acceleration	93(32.2%)	517(32.9%)	258(29.7%)	0.268
Epidural Analgesia	68(23.5%)	388(24.7%)	191(22%)	0.326

Though we had higher percentage of medical co-morbidities in the short stature group, there was no change in our induction rates. The duration of labour were comparable in all the three groups which proves that inspite of trial of labour was given for short stature woman, decision making was done at the appropriate timing to reduce the maternal and neonatal complications. The need for Oxytocin acceleration and Epidural analgesia were equal in all the three groups.

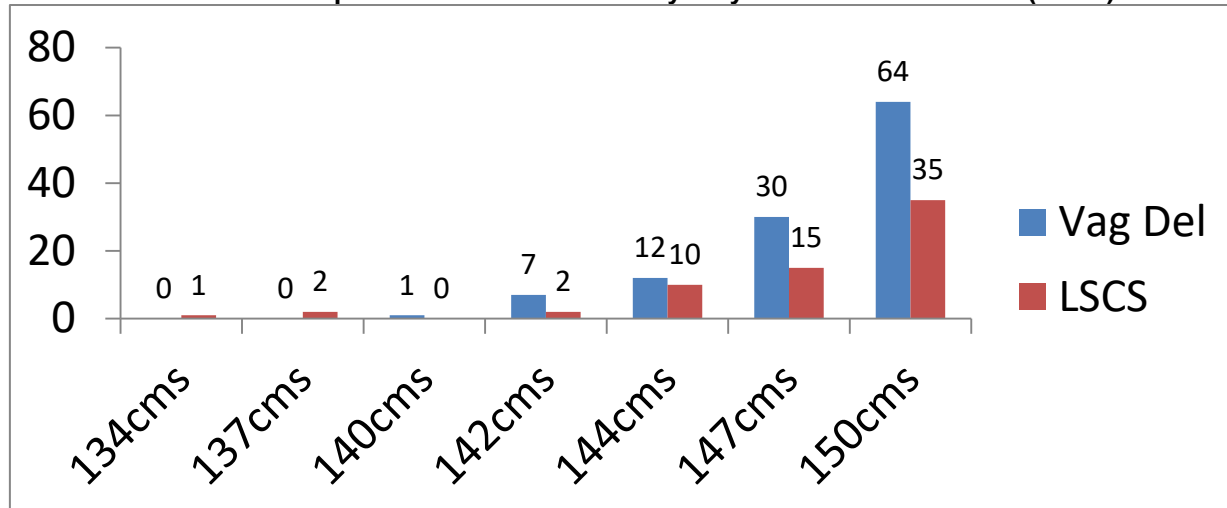
**Table 4: Mode of Delivery**

Delivery	≤150cms(n-289)	151-160cms(n-1573)	>160cm (n-869)
Spontaneous Vaginal	115 (40%)	840 (53.4%)	538 (61.9%)
Instrumental Delivery	53 (18.4%)	346 (22%)	163 (18.8%)
VBAC	14 (4.8%)	57 (3.6%)	30 (3.5%)
Elective LSCS	17 (5.9%)	38 (2.4%)	18 (2.1%)
Emerg LSCS	55 (19%)	152 (9.7%)	65 (7.5%)
Rpt LSCS	35 (12.1%)	136 (8.6%)	50 (5.8%)

p Value – 0.0005 (Statistically significant)

In our study, we had 63% vaginal deliveries, including 4.8% vaginal birth after caesarean (VBAC) deliveries in the short stature group, without increase in the instrumental deliveries. The number of Emergency LSCS was higher in the short stature group of about 19% and common indication being failure to progress and fetal distress.

**Table 5: Comparison of mode of delivery only in short stature Primi (n-179)**



In our study, pregnant woman >142cms height had higher rates of vaginal deliveries compared to LSCS.

**Table 6: Maternal and Neonatal complications**

Maternal complications	≤150cms(n-289)	151-160cms(n-1573)	>160cm (n-869)	p Value
Third deg PT	1%	0.6%	0.8%	0.636
Complete PT	1%	0.3%	0.2%	
Postpartum Haemorrhage	2.8%	2.9%	3.6%	
<b>Neonatal Complications</b>				0.0006
Shoulder Dystocia	4%	1.1%	0.1%	
Meconium stained liquor	11%	9.7%	9%	
Perinatal asphyxia	2.4%	1.4%	0.9%	
NICU Admission	0.9%	0.6%	0.1%	
ERBS Palsy	0.3%	0.2%	0.1%	

The percentage of maternal and neonatal complications were comparable in all the three groups, except for shoulder dystocia which was higher in the short stature group.

**Discussion:**

The effect of maternal height was found to be non linear with the greatest implications for women of short stature . However, in real practice, variables other than maternal height are usually taken into account. The effect of height can be compared with the well known risk factors of maternal age and body mass index on the risk of caesarean section rates. Certainly a short stature mother with low birth weight does not carry a high risk for cephalopelvic disproportion[7].

In the present study, in short stature woman, the incidence of emergency caesarean section was 19%, while Elective LSCS done for breech, twins were 6%, and Rpt LSCS were 12% contributing to a total of 37% which is comparable to the study done by Alka Garg et al [8] in 2015 who had 33% caesarean section rates, but less compared to study done by Sylvia et al [9] in 2007 whose rate was 41%. We did not include the deliveries less than 34weeks in the study since it is very rare in our practice to encounter cephalopelvic disproportion at such early gestation regardless of maternal height.

In our study, we had higher rate of vaginal birth after caesarean section (VBAC) of about 5% which was compared to other two groups. Obstructed labor

which is said to be an important complication of short stature woman was 4% which is almost comparable to other groups.

More precaution must be given to mothers with high risk in terms of close monitoring or preparation of caesarean section or timely labor induction in daytime when more manpower and experienced physicians are available. Based on our study and other previous studies in the western, the criterion for short stature should be definitely based on ethnic groups and must be categorized according to height percentile range rather than absolute height may allow comparison between different populations on the effect on labour outcomes [1].

Sheiner et al [11] in 2005 assumed that even mild deviation from the normal labor curves may lead to caesarean sections if the obstetrician realizes that the mother is short. Lao TT et al [12] in 2000, in his study concluded that there is high risk of caesarean section in teenage mothers but in our study we couldn't find such correlations as the numbers were less.

In our study, the average birth weight was 2.5-3.5kgs in all the three groups, while less than 2.5kgs was higher in shorter woman of about 17%.The maternal complications like third degree perineal tear, complete perineal tear and postpartum haemorrhage

were comparable in all the three groups, while in neonatal complications, shoulder dystocia as slightly higher in short stature woman. From our study, we were able to prove that in pregnant woman >142cms, vaginal delivery is possible and hence trial of labour should be given in all woman irrespective of stature.

#### Conclusion:

In our study, we had 63% vaginal deliveries in the short stature group without increase in induction rate, duration of labor, instrumental deliveries and maternal and neonatal complications. Short stature is not an independent risk factor. We have to individualize each and every patient and decide accordingly in active phase of labor, especially in mothers with average size babies. Even in mothers with previous LSCS, we can give trial of labor if the pre requisites permits and if the facilities are available. Contracted pelvis is a rare entity nowadays. Cephalopelvic disproportion should be ruled out only when the patient enters active labor. Vigilant monitoring can make vaginal delivery safe.

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