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RESEARCH ARTICLE

A STUDY OF ASSOCIATION OF MATERNAL HEIGHT AND ESTIMATED BIRTH WEIGHT ON MODE OF DELIVERY

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ABSTRACT

Introduction: In a pregnant woman maternal height and antenatally measured expected birth weight can influence mode of delivery at term. Mode of delivery can be either normal vaginal delivery orcesarean section. Aims and objective of my study is to find out the association between maternal height and antenatally measured birth weight in outcome of pregnancy at term.

Method: 200 full term primiAnd multigravida women without any obstetric and medical complications who were admitted in C.U.Shah medical college and hospital for delivery were randomly selected for study. After delivery 26 women who underwent caesarean delivery and 21 women underwent instrumental delivery formed the study group and 153 women who underwent vaginal delivery formed control group. These two groups were compared for their maternal heights and antenatal estimated foetal weight (by Johnson's formula).

Result: In present study Out of 43 short statured women (height ≤138 cm) 27(62.8%) had caesarean section or instrumental delivery and 16(37.2%) women were delivered vaginally. Out of 8 women with high expected birth weight >3.5kg), 7 women (87.5%) delivered by either caesarian section or instrumental delivery and only one (12.5%) women delivered by normal vaginal delivery.

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INTRODUCTION

Pregnancy is one of the most critical and unique period in woman's life cycle. It is regarded as (welcome event) for successful womanhood (Vijayalaxmi, 2009). Maternal and fetal mortality and morbidity are major health problems in developing countries like India. Throughout the world 2, 92,000 per year woman die as a result of preventable causes related to pregnancy and childbirth, of which 99% of all maternal mortality occurs in developing countries. Numerous studies have shown shorter maternal height and/or larger newborn weight to be associated with increased delivery complications (AbouZahr, 2014). One of the important areas in which obstetricians can contribute significantly is the care of pregnant woman. One of the primary goals of the antenatal care is to identify those woman with raised risk of problems during pregnancy or delivery, in order to ensure that precautionary measures are instituted whenever possible or more intensive medical are is to be provided.

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The association between maternal height in pregnancy outcome have been interpretate based upon a mechanical assumption that maternal height set a physical constraint on the intrauterine environment (shorter woman may have a small uterus size, limiting fetal growth, Several studies from India have shown that very high rate of low birth weight babies among the mothers with height less than 140 cm (Gopalan, 1992; Ghosh, 1977 and Deshmukh, 1998) in contrast to fetal birth weight at term around 200 gm of variation seen between short (143cm) and tall (162 cm) mothers (Pachauri, 1971). Numerous studies of healthy woman from both wealthy and less wealthy countries have shown that shorter maternal height and greater new born height associated with increased delivery complications, and results in maternal or fetal morbidity or mortality (Parsons, 1989; Harrison, 1990; Dougherty, 1988 and Thomson, 1988). Many studies of maternal anthropometry and pattern of pregnancy outcome recommend the use of anthropometry pattern like maternal height and weight for screening and its application for betterment for pregnancy outcome (Maternal anthropometry and pregnancy outcomes, 1995). Antenatal care in rural areas is provided by traditional

birth attendant (dais) and village health workers. To prevent this complication it is important to develop a simple risk indicator, which is easy to use, reliable and consistent. Maternal height is one of the simplest measurement to take into consideration. Using this indicator, a specified height is defined and below this attention is paid to the risk of CPD or contracted pelvis and for the referral to higher centres. The current study was carried out to access the association of maternal height and estimated birth weight on obstetric outcome.

MATERIALS AND METHODS

My study was a cross sectional case control study carried out in department of obstetrics and gynecology C.U.shah medical college Surendranagar from 2016 to 2017,200 full term primi and multigravida woman without any obstetrics and medical complication who were admitted for delivery were randomly selected for my study.

Inclusion criteria

- Singleton vertex presentation
- Spontaneous onset of labor
- Active phase of labor (75% effaced cervix and minimum 3 cm dilatation)

Exclusion criteria

- Pregnancy with medical or obstetrics complication
- Non vertex presentation
- Fetus with congenital anomalies
- Those were indicated for elective cesarean section

Fetal Weight Estimation done by Johnson's Formula-
Fetal weight (g) = (McDonald's measurement - 13) × 155 When the presenting part was at "minus" station
= (McDonald's measurement - 12) × 155 when presenting parts at "zero" station.
= (McDonald's measurement - 11) × 155 when presenting part at plus station (McDonald's measurement – symphysiofundal height)

If woman weighed more than 91 kg, 1 cm was subtracted from fundal height.

RESULTS

Table 1. Distribution of patients according to height (cm) in both the groups

Height	Nu. of Cases	Percentage
<135CM	13	6.5
136-140CM	30	15
141-145CM	40	20
146-150CM	51	25.5
151-155CM	43	21.5
156-160CM	16	8
161-165CM	7	3.5

In present study out of 200 patients from study group, 13 (6.5%) had height less than 140 cm. No. of Patients with height 141-145 cm is 30 (15%), height 146-150 is 71 (35.5%), height 146-150cm is 71 (35.5%), height 151-155cm is 58 (29%), height 156-160cm is 21 (10.5%) and height 161-165cm is 7 (3.5%).(Table 1).

Table 2. Maternal height and mode of delivery

Height	Mode of delivery			Total
	Normal delivery	Instrumental delivery	LSCS	
<135CM	2	-	11	13
136-140CM	14	2	14	30
141-145CM	24	8	8	40
146-150CM	39	4	8	51
151-155CM	34	5	4	43
156-160CM	14	2	-	16
161-165CM	6	1	-	7

In the present study (1) in maternal height range of <135 cm among 13 (6.5%), 2caseswere undergone spontaneous vaginal delivery and 9 cases were undergone caesarian delivery caesarean delivery. (2) In maternal height range of 136 - 140 cm among 30cases (15%), 14(7%) cases was undergone spontaneous vaginal delivery, 2(1%) case was delivered by instrumental delivery while 14(7%) of cases were undergone caesarean delivery. (3) In maternal height range of 141-145cm out of 40 cases, 24(12%) cases delivered spontaneous vaginally, 8(4%) were required instrumental delivery while 8(4%) cases were required caesarean delivery. (4) In maternal height range of 146-150cm among 51 cases,39(19.5%) cases was undergone spontaneous vaginal delivery, 4(2%) case was delivered by instrumental delivery while 8(4%) of cases were undergone caesarean delivery.(5) In maternal height range of 151 - 155 cm among 43 cases,34(17%) cases was undergone spontaneous vaginal delivery, 5(2.5%) case was delivered by instrumental delivery while 4(2%) of cases were undergone caesarean delivery.(6) In maternal height range of 156 - 160 cm among 16 cases, 14(7%) cases was undergone spontaneous vaginal delivery, 2(1%) case was delivered by instrumental delivery while no casewere undergone caesarean delivery.(7) In maternal height range of 161 - 165 cm among 7 cases, 6(3%) cases was undergone spontaneous vaginal delivery, 1(0.5%) case was delivered by instrumental delivery while no case were undergone caesarean delivery. Out of all 200 cases in maternal height range 133(66.5%) cases were delivered spontaneous vaginally, 22(11%) cases were required instrumental delivery while 45(22.5%) cases required caesarean delivery. (Table 2).

Table 3. Expected birth weight and mode of delivery

Expected birth weight	Mode of delivery		
	Normal delivery	Instrumental delivery	LSCS
1.5-2KG	8	-	1
2-2.5KG	55	1	3
2.5-3KG	52	8	7
3-3.5KG	17	7	18
3.5-4KG	1	6	15
4-4.5KG	-	-	1

As per above table as expected birth weight increases, rate of instrumental delivery and caesarian section increases. (TABLE3). In the present study in higher maternal height range (>150 cm) and lower estimated fetal weight range (<2.5 kg) most of the babies are delivered vaginally.

Similarly in lower maternal height range (<145 cm) and higher estimated fetal weight range (>3 kg), most of the babies are delivered by either instrumental delivery or caesarean section (Table 4).

DISCUSSION

In the present study incidence of caesarean delivery and instrumental delivery in short mothers (height<138cm) was 62.8% while that in women with height more than >138cm was 37.2%. Thus women who are less than or equal to 138cm have higher risk of caesarean delivery or instrumental delivery when compared to women of more than 138 cm. Women with lesser height and larger baby were more likely to go for caesarean delivery or instrumental delivery.Karltreinder mentions that taller women tend to produce heavier children in contrast to the shorter women who tend to produce lighter ones (Frank, 1963).

Conclusion

We concluded that short statured women with larger baby size had higher incidence of caesarean delivery or instrumental deliveryIn present study Out of 43 short statured women (height ≤138 cm) 27(62.8%) had caesarean section or instrumental delivery and 16(37.2%) women were delivered vaginally.(Table 2). Out of 8 women with high expected birth weight >3.5kg), 7 women (87.5%) delivered by either caesarian section or instrumental delivery and only one (12.5%) women delivered by normal vaginal delivery. As expected birth weight increases, chance of caesarian delivery or instrumental delivery increases and as height increases, expected birth weight is also increases (Table 3).

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