

# Study of Maternal Anthropometry and Pregnancy Outcomes

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## Summary:

Five hundred pregnant women were taken for the study, which was a representative sample of the Indian pregnant women. It was observed from the data that maternal weight of less than 50 kg and maternal height of less than 150 cm were observed to be high risk factors for foetal outcome. The foetal weight and head circumference were found to increase with increasing maternal weight and height, and the results were found to be statistically significant. No correlation could be established between the foetal and the maternal foot length but women having height less than 150 cm had a tendency to have a smaller foot length (20-21.9 cm.) and women having height more than or equal to 165 cm had a tendency to have a longer foot length (> 24 cm).

## Introduction

The impact of different maternal factors on the outcome of pregnancy has been well-documented even in the past. The relation of maternal factors to foetal and neonatal mortality and morbidity is fascinating and is a growing area of interest in medical practice. When maternal factors are correlated with birthweight, they have an important bearing on social aspects of obstetrics and paediatrics. Birthweight of a newborn is one of the most important determinant to give us the probability of newborn to survive, and experience healthy growth and development. It is also an important indicator of nutritional status, reproductive maturity and health status of a pregnant woman. It reflects health of expectant mother, extent of antenatal care she has received and prevailing maternal nutrition and socioeconomic conditions.

## Material and Methods

This study was conducted in the department of obstetrics and gynaecology of I. N Hospital. The study comprised of a total of 500 pregnant women. At the time

of admission, a detailed history was taken, physical examination and maternal anthropometry was done to evaluate the following:

1. Height of the mother
2. Weight of the mother
3. Footlength of the mother

After delivery, the pregnancy outcome was studied on basis of the following parameters:

1. Newborn's birthweight
2. Apgar score
3. Head circumference of the newborn
4. Length of the newborn.

The information so gathered was analyzed with the help of a computer system. Correlation co-efficient and test of significance by chi square test was determined.

## Result

During the period of study all the 500 patients that were included in the study were observed and various anthropometric measurements were recorded and their impact on the pregnancy outcome was studied as shown in table I to V.

**Table: I**  
Maternal weight in relation to birthweight

Maternal Weight (Kg)	Total Cases	Foetal weight		Mean Birth wt. +SD
		< 2500 No.	> 2500gm No.	
<50	87	45	42	2.46+0.44
50-54	152	48	104	2.57+0.35
55-59	123	17	106	2.82+0.66
60-64	88	15	73	2.86+0.93
>65	50	6	44	2.95+0.37
Total	500	131	369	

p&lt;.001

**Table: II**  
Maternal height in relation to birthweight

Maternal Height (cm)	Total cases	Foetal weight		Mean Birth weight +SD
		< 2500 No.	> 2500gm No.	
<150	72	29	43	2.58+0.45
150-54	213	63	150	2.62+0.39
155-159	157	30	127	2.78+0.37
160-164	53	9	44	2.87+0.42
>165	5	0	5	2.93+0.26
Total	500	131	369	

p&lt;.01

**Table: III**  
Maternal weight in relation to recumbent length

Maternal Weight (kg)	Total cases	Recumbent length (cm)			Mean recumbent length + SD
		<45	45.1-47.9	>48	
50	87	8	41	38	47.14 + 1.51
50-54	152	9	48	95	47.97 + 1.53
55-59	123	5	25	93	48.38 + 1.78
60-64	88	4	16	68	48.95 + 1.49
65	50	0	6	44	49.30 + 0.67
Total	500	26	136	338	

p&lt;.001

**Table: IV**  
Maternal height in relation to recumbent length

Maternal Weight (kg)	Total cases	Recumbent length (cm)			Mean recumbent length + SD
		<45	45.1-47.9	>48	
<150	72	3	29	40	47.36 + 1.63
150-154	213	14	65	134	47.8 + 1.39
155-159	157	8	34	115	48.4 + 1.53
160-164	53	1	8	44	48.12 + 1.04
165	5	0	0	5	49.08 + 1.25
Total	500	26	136	338	

p&lt;.02

**Table: V**  
**Maternal foot length in relation to foetal weight**

Maternal foot Length (cm)	Total cases	Foetal weight		Mean birth weight+SD
		<2500	>2500gm	
20-21.9	218	68	150	2.6+0.16
22-23.9	259	59	200	2.76+0.87
>24	23	4	19	2.89+0.42
Total	500	131	369	

p<.05

## Discussion

The norms of average maternal and foetal parameters are different for different regions due to socioeconomic and geographic conditions and what is true for western countries may not hold good for this part of the world. Hence it is important to establish norms for this country.

**Maternal weight:** The percentage of low birthweight babies was more in the study group having maternal weight less than 50 kg (table - 1). This was found to be statistically significant. Kelly et al in 1996 concluded that a single measurement of attained weight at 5 or 7 lunar months is the most practical screening instrument for low birthweight and IUGR in most primary health care settings and provides warning of the need for intervention. Similarly Karim & Taylor in 1997 observed that mother's weight at term was the best predictor of birthweight, with a correlation coefficient of 0.49. Good weight mothers had higher proportion of new borns with recumbent length of more than or equal to 48 cm.

**Maternal height:** ICMR study (1981-84) in three urban slums in Madras, Delhi and Calcutta and three rural areas near Chandigarh, Varanasi and Hyderabad, (Prem K, 1985) revealed that maternal height of less than 145cm is a risk factor for the newborn. In the present study, the mean birthweight showed an increasing trend with increasing maternal height, 2.58 + 0.48 kg in women of height < 150 cm to 2.93 + 0.26 kg in women of height >165cm. The difference in mean birthweight between these

groups of maternal height (table-II) was found to be statistically significant. Maternal short stature, low rate of gestational weight gain may lead to shortened gestation by increasing the risk of idiopathic preterm labour as seen by Kramer et al in 1995. Also Fawzi et al in 1997 observed that maternal height was significantly associated with birth length and that maternal height, weight and skinfold thickness at 6 and 9 months of pregnancy were positively associated with mean birthweight. Therefore recognition of sociobiological maternal factors affecting pregnancy outcome needs due attention to improve foetal wellbeing, to ensure proper development of productive population of the future and to construct a complete data for further studies on foetal outcome among Indian pregnant females. Hence it can be concluded from this study that maternal weight of less than 50 kg and maternal height of less than 150 cm were observed to be high risk factors for the foetal outcome.

## References

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