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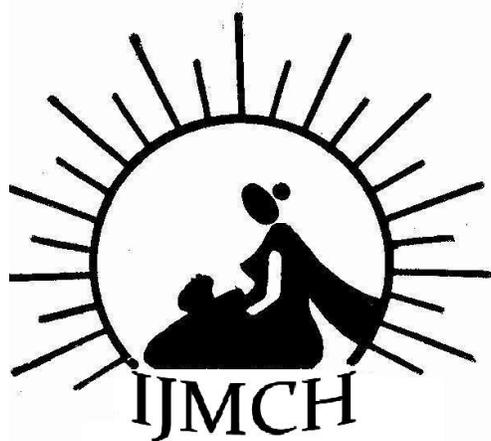
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To estimate the low birth weight rate and to investigate the influence of parental anthropometries on birth weight.

Does the paternal and maternal anthropometry influence the birth weight of the children? A cross sectional study in a rural maternity hospital, South India

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ABSTRACT

Introduction: Low birth weight rate is a good indicator of a public health problem. Several factors have been associated with baby's birth weight. Maternal influences on birth weight are known, paternal influences less studied.

Objective: To estimate the low birth weight rate and to investigate the influence of parental anthropometries on birth weight.

Methodology: A cross sectional study was carried out among the 164 delivered babies and their parents during the period of July–August 2013. A structured interview schedule was used to collect data.

Results: The low birth weight rate was found to be 19.5%. Correlation analysis for Birth weight, with the factors such as parental age, parental height, paternal weight, paternal BMI, paternal waist and Hip circumference showed no correlation. **Conclusion:** Low birth weight rate among our study population was found to be low. Our study showed that birth weight is not associated with the paternal anthropometries mentioned.

Key words: *Low birth weight, Parental anthropometry, Birth weight.*

INTRODUCTION

The low birth weight rate (birth weight up to and including 2499 g) in a population is a good indicator of a public health problem that includes long-term maternal malnutrition, ill health and poor health care. On an individual basis, low birth weight is an important predictor of new-born health and survival¹. The reduction of low birth weight forms an important contribution to the Millennium Development Goal for reducing child mortality. Almost 96% of low birth weight infants are born in developing countries².

A baby's low weight at birth is either the result of preterm birth (before 37 weeks of gestation) or of restricted foetal (intrauterine) growth. Low birth-weight is closely associated with foetal and neonatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life. Many factors affect the duration of gestation and foetal growth, and thus, the birth weight. They relate to the infant, the

mother or the physical environment and play an important role in determining the infant's birth weight and future health³.

Need for the study: Several factors have been associated with baby's birth weight. Foetal factors- sex, maternal factors – stature, nutrition, order of pregnancy, age, associated infection, blood pressure, socioeconomic status. While in industrialized countries the epidemiology of low birth weight has been extensively studied, in less developed countries reliable data on low birth weight remain limited. Maternal influences on birth weight are known, paternal influences less studied.

Objectives

1. To estimate the birth weight of babies born to the mothers delivering in Snehalaya hospital, Solur.
2. To determine the association between the birth weight and parental anthropometry.

METHODOLOGY

A cross sectional study was carried out among the 164 delivered babies and their parents in Snehalaya hospital, Solur, Magadi Taluk, Ramnagara District, Karnataka, India. Most of them were from rural background. The study was conducted during the period of September-October 2013. Preterm, twin delivery, seriously ill were excluded from the study. Assuming a prevalence of 30% (UNICEF report) with a precision of 7% and 95% confidence; using the formula $n = Z^2 pq / d^2$ where, z = relative deviate (1.96 at 95% confidence), p = prevalence (30%), $q = (100 - p)$, d = precision (7%)

Sample size was calculated to be 164.

A predesigned, structured interview schedule was used to collect relevant data from the respondents.

The interview schedule had three parts:

Part1. Socio-demographic details: Includes Maternal age, Religion, Literacy level of women and their husbands, Occupation of women and their husbands, Income, Socio economic status, Marital status, possession of BPL card, Gestational age, Obstetric score, Type of family, No of family members.

Part2. Antenatal details: Includes date of Last menstrual period, Number of antenatal check-ups, any pre-existing medical problems, Consumption of Iron, Folic acid, Calcium, Multivitamin tablets, pre pregnant weight and immunisation status against tetanus.

Part3. Anthropometry: Includes A) Paternal age, height, weight, head circumference, smoking and alcohol status. B) Maternal height, pre pregnant weight, head circumference,

smoking and alcohol status. C) New-born birth weight, length, mid arm circumference, head circumference and chest circumference.

Procedure:

Institutional ethical committee approval was taken prior to the study. Consecutive sampling was followed. After establishing rapport with the study subject, the purpose, procedure, benefits, risks and confidentiality of the study were explained. Informed written consent from the study subject was taken before the questionnaire was administered.

Statistics and analysis of the data:

The data was coded and entered in Microsoft Excel and analysed using SPSS version 16 for proportions, frequencies and correlations. Frequencies, measures of central tendency and dispersion, Pearson and Spearman's rank correlation were used to analyse data when the data is normally distributed and not normally distributed respectively. We considered p value as significant when p value is less than 0.01(two tailed).

RESULTS

Most of the women in the study hail from rural background. 158(96.3%) out of 164 belong to Hindu religion. Out of 164, 66(30%) of women belong to three generation family, 50(22.4%) to joint family and 32(14.5%) to nuclear family. 102 out of 164(64%) possess BPL card. The socio-demographic details are represented in Table 1 and Table 2.

Table 1: Socio-demographic details (N= 164)

Sl. No	Variable	Category	Number	Percentage
1.	Place of residence	Rural	159	97%
		Urban	5	3%
2.	Socio economic status (Modified BG Prasad Classification on 2013)	I.	5	3%
		II.	19	11.6%
		III.	35	21.3%
		IV.	75	45.7%
		V.	30	18.3%
3.	Parity	Primi	100	61.3%%
		Second para	55	33.7%
		Third para	9	5%

Table 2: Socio-demographic details (N= 164)

Sl. No	Variable	Category	Mother	Father
1	Age (in Years)	<19	13(8%)	0
		20 – 30	145(90%)	125(78%)
		>30	3(2%)	35(22%)
2	Education (Highest education attained)	Illiterate	2(.9%)	0
		Primary school	0	1(.5%)
		Middle school	14(6.3%)	27(12.2%)
		High school	77(34.8%)	82(37%)
		Higher secondary school	54(24.4%)	32(14.5%)
		Graduation	17(7.7%)	15(6.8%)
		Post-graduation	0	5(2.3%)

In our study we found that the rate of low birth weight (birth weight up to and including 2499 g) was found to be 19.5%. The mean birth weights of babies were 2809 grams with standard deviation of 396. The distribution of birth weight is represented in Chart 1.

We did a correlation analysis after checking for normality. We applied Pearson and Spearman's rank correlation tests as appropriate. We found that there was no correlation between birth weight and with the paternal anthropometries such as parental height, paternal weight, paternal BMI, paternal waist and Hip circumference and parental age. The results of correlation tests are represented in Table 3.

Similarly, we did correlation analysis for the other anthropometries of new-born such as Birth length, Head circumference and chest circumference with the factors such as, parental height, paternal weight, paternal BMI, paternal waist and Hip circumference and parental age. We were unable to find any correlation between them.

Chart 1

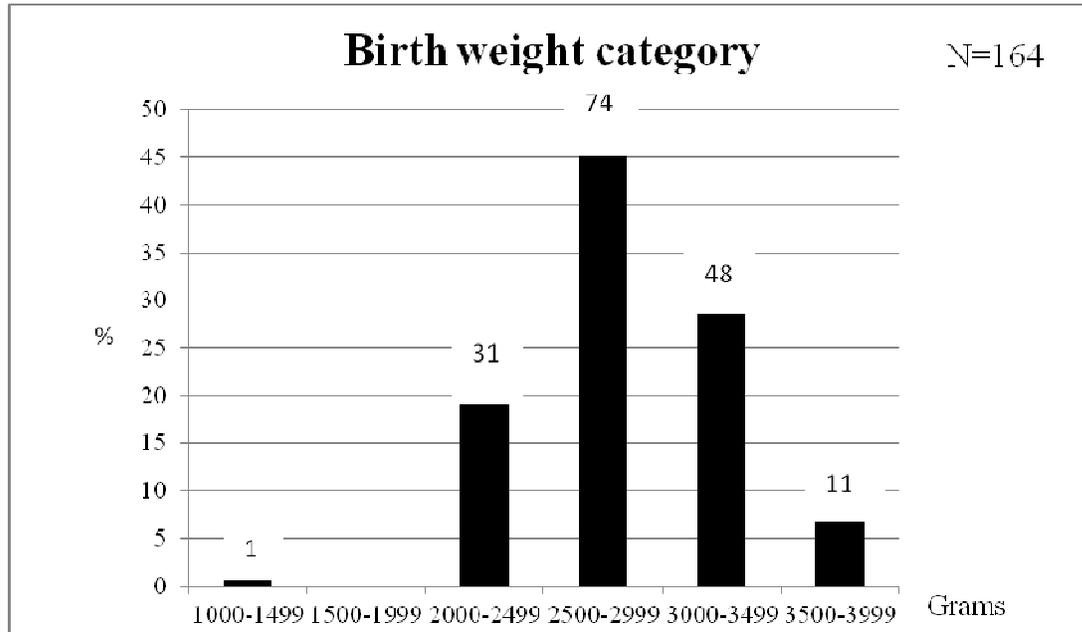


Table 3: Correlation between birth weight and paternal anthropometry:

Sl. No	Antecedent variable	r	p*
1.	Mother's Age	-.088	.269
2.	Mother's Height	-.029	.716
3.	Father's Age	-.013	.873
4.	Father's height	.009	.912
5.	Father's Weight	.078	.349
6.	Father's BMI	.076	.364
7.	Father's Waist Circumference	.088	.294
8.	Father's Hip Circumference	.110	.187

*Correlation is significant at the 0.01 level (2 tailed)

DISCUSSION

Our study showed that the rate of low birth weight was found to be 19.5%, as against 30% in India by a UNICEF report. This can be explained by the fact that the study is done in a hospital setting. So there may a possible existence of under estimation of low birth weight rate.

In developed countries the epidemiology of low birth weight has been extensively studied, in less developed countries reliable data on low birth weight remain limited. The primary reason is that more than 40 per cent of babies are born at home and without a skilled attendant³. Considering the fact of 100% Institutional deliveries in near future, the studies conducted in hospitals will reflect true situation.

A cross sectional study among nurses in USA showed that birth weight is associated with maternal birth weight, maternal height, maternal and paternal BMI, maternal weight gain during pregnancy ($p < 0.0001$)⁴.

A study comprising of 18819 children from UK Millennium Cohort study showed that maternal and paternal height and weight exert independent and significant influences on offspring's birth weight. The influences of parental height and weight on birth weight and infant weight gain are similar for the two parents, with the exception of the influence of weight on birth weight where the mother is much more influential than the father.⁵

However, in our study we could not establish any influence by parental anthropometry on birth weight of their babies. This may be explained by the following reasons. Firstly, Birth weight is influenced by numerous factors. Secondly, the sample size of 164 may be small to get correlation.

Hence we recommend the same study in a larger population, So that the influence of parental anthropometries can be studied thoroughly. Through which the interventions on mother and child for improving the maternal and child health can be justified.

CONCLUSION

Low birth weight rate among our study population was found to be low. Our study showed that birth weight is not associated with the paternal anthropometries such as parental height, paternal weight, paternal BMI, paternal waist and Hip circumference and parental age. We recommend the same study in a larger population.

Source of support: Nil

Conflict of interest: Nil

Ethical Clearance: Obtained from Institutional Ethical Committee (IEC) in St. John's Medical College.

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