

A Hospital Based Observational Study Assessing Association between Maternal Education and Birth Weight of the Baby

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Abstract

Aim: The aim of the present study was to find out the correlation between maternal education and birth weight of the baby.

Methods: A hospital based cross-sectional study was conducted in the Department of Pediatrics, during the study period of 1 year. The total of 500 mothers who were admitted in the postnatal wards of GMCH, Bettiah, Bihar, India during the study duration were enrolled in the study.

Results: The present study shows that 65% mothers were educated up to high school, 10% were graduated and only 2% were post graduated. Mean education was 9th standard. 58.07% mothers had height between 150-159 and 0.39% mothers were < 130 cm tall. Mean height of mother was 145.11 cm. In our study, we found that rate of LBW babies was significantly high among uneducated women. Maximum women belonged to 150-159 cms followed by 140-149 cms. Most of the women had weight between 40-49 kgs followed by 50-59 kgs.

Conclusion: Poor health at birth is greater among babies of mothers with low education. Our study shows that, in a setting where healthcare system provides essential health services to all women, irrespective of their socioeconomic status, mother's education is strongly associated with adverse perinatal outcomes, including preterm birth, SGA. These findings merit attention from a public health perspective.

Keywords: Maternal education, Low birth weight

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Introduction

Birth weight plays an important role in infant survival, child development, and adult metabolic diseases. [1–3] Maternal characteristics have been variously shown to impact on the progress and outcome of pregnancy, especially those related to birth weight and perinatal mortality. [3–6] Such maternal factors like genetic endowment, socio-cultural, demographic, and medical conditions (e.g. hypertension, malaria, urinary tract infections, malnutrition and anaemia) are strongly associated with foetal complications especially low birth weight, prematurity and birth asphyxia all of which act individually or in concert with each other to increase neonatal and infant mortality. [6–8]

There are several determinants of low birth weight (LBW) --- weight at birth < 2,500 grams ---, and one of the most relevant is maternal social status, which has a close and direct association with maternal education level. Even in developed countries, mothers in unfavorable socioeconomic status and with low education level present greater vulnerability to having LBW children. [9] Conversely, the use of new health technologies in

the preconception, prenatal, and perinatal periods has led to an increase in the proportion of LBW, especially in the more affluent social strata, which have greater access to such procedures. [10] Additionally, late pregnancies also add to this outcome. Recent observational studies have shown an increase in LBW in more privileged social groups and in regions with higher economic growth. [11,12]

Low birth weight is associated with many socio-economic factors such as residence (urban-rural difference), mother's age and occupation, birth order, the family's income and many maternal conditions such as nutritional status, mother's educational and health status. [13] Known factors for pre-term delivery and fetal growth retardation which are associated with LBW include low maternal food intake and illness, especially infections. Studies suggest that short maternal stature, very young age, high parity, close birth spacing were all associated factors. [14,15]

The aim of the present study was to find out the correlation between maternal education and birth weight of the baby.

Materials and Methods

A hospital based cross-sectional study was conducted in the Department of Pediatrics, GMCH, Bettiah, Bihar, India during the study period of 1 year. The total of 500 mothers who were admitted in the postnatal wards of GMCH, Bettiah, Bihar, India during the study duration were enrolled in the study. Questionnaire method was used to collect the data from the patients. After consent detailed history was taken and physical examination was done and anthropometric measurements were taken. The variables used in the study were education of mother, maternal age, period of gestation, age, height and weight of mother, Hemoglobin at the time of delivery, mode of delivery, birth weight of the baby, length of the baby and head circumference of baby. The collected data was first checked for completeness and consistency. The entered data were cleaned and edited before subsequent analysis. To interpret gestational age and weight of the baby following method was used

AGA – Appropriate for gestational age LGA – Large for gestational age

SGA – Small for gestational age

Full term baby – More than 37 weeks of gestation

Preterm baby – Less than 36.6 weeks of gestation

This cross sectional study was approved by institutional Ethical Committee of A hospital based cross-sectional study was conducted in the Department of Pediatrics, GMCH, Bettiah, Bihar, India during the study period of 1 year. The total of 500 mothers who were admitted in the postnatal wards of GMCH, Bettiah, Bihar, India and written informed consent was obtained from all the respondents before enrolment in the study. All relevant data was filled into Microsoft excel. The analysis was done with the help of MS Excel.

Results

Table 1: Maternal Education

Education	Frequency	%	Normal birth weight	LBW	VLBW	ELBW
Uneducated	25	5	14	11	0	0
Primary school	15	3	10	5	0	0
High school	325	65	165	155	5	0
Junior college	75	15	50	24	0	1
Graduation	50	10	35	15	0	0
Post-graduation	10	2	1	9	0	0
TOTAL	500	100	275	219	5	1

The present study shows that 65% mothers were educated up to high school, 10% were graduated and only 2% were post graduated. Mean education was 9th standard. 58.07% mothers had height between 150-159 and 0.39% mothers were < 130 cm tall. Mean height of mother was 145.11 cm. In our study, we found that rate of LBW babies was significantly high among uneducated women.

Table 2: Maternal Height (cms)

Maternal Height	N	%
< 130	5	1
130-139	10	2
140-149	150	30
150-159	285	57
>160	50	10

Maximum women belonged to 150-159 cms followed by 140-149 cms.

Table 3: Maternal Weight (Kgs)

Maternal Weight (Kgs)	N	%
< 40	25	5
40-49	200	40
50-59	190	38
60-69	65	13
70-79	20	4

Most of the women had weight between 40-49 kgs followed by 50-59 kgs.

Discussion

Low birth weight is one of the most serious challenges in maternal and child health in both

developed and developing countries. It is an essential determinant of mortality, morbidity and disability in infancy and childhood and also has a long-term impact on health outcomes in adult life. WHO estimates that globally about 25 million low birth weight babies are born each year, consisting

14% of all live births, nearly 93% of them in developing countries. Southern Asia is the region with highest incidence (27%). The low birth weight is considered as sensitive index of nation's health and development. [16] Biological factors such as gestational age (GA), maternal anthropometry, weight and height, education, parity of mother, sex of delivered child, and lifestyle factors like dietary habits, tobacco or caffeine consumption can also influence birth weight. Studies have also shown socioeconomic factors like maternal education and household income as important factors affecting birth weight. Women with low education, poverty, and poor nutritional status are coexistent in rural part of India and therefore they are at increased risk of adverse reproductive outcomes including LBW and preterm birth. [17]

The present study shows that 65% mothers were educated up to high school, 10% were graduated and only 2% were post graduated. Mean education was 9th standard. 58.07% mothers had height between 150-159 and 0.39% mothers were < 130 cm tall. In addition, education is a recognized factor affecting a person's health awareness, attitude, and practice. Women with higher educational attainment may be more likely than other women to demonstrate health care-seeking and influence the content of their care through their requests for and adherence to provider advice on positive pregnancy-related behaviors, which may contribute to reducing their risk of LBW deliveries. [18] Some researchers have advised reinventing prenatal care as a more flexible model, with content, frequency, and timing tailored to maternal and fetal risk to improve poor birth outcomes in view of the well-intentioned but ultimately ineffectual universal prenatal care to heterogeneous groups with different medical and psychosocial risks. [19]

Mean height of mother was 145.11 cm. In our study, we found that rate of LBW babies was significantly high among uneducated women. Maximum women belonged to 150-159 cms followed by 140-149 cms. Most of the women had weight between 40-49 kgs followed by 50-59 kgs. 12 Other studies from Indian subcontinent also have documented almost similar percentage of LBW, 30.3% in Deshmukh et al. study [20], Velankar [21] reported the incidence as high as 45.2%. Negi et al [22] observed the incidence to be around 23.8% whereas; Trivedi and Mavalankar [23] and Kamala doss et al [24] reported 20.37% and 24.6% LBW, respectively, in their studies. Despite various efforts done to improve maternal and child health in our country, the prevalence of LBW is still on the higher side.

Conclusion

Poor health at birth is greater among babies of mothers with low education. Our study shows that, in a setting where healthcare system provides

essential health services to all women, irrespective of their socioeconomic status, mother's education is strongly associated with adverse perinatal outcomes, including preterm birth, SGA. These findings merit attention from a public health perspective. Cost effective alternative measures is required to enhance female literacy, as illiteracy is directly related to low socio-economic condition, poor nutrition, lack of rest and underutilisation of services. Hence the problem of low birth weight babies was found to be prevalent and associated with various risk factors resulting in its continual endemicity in newborns.

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