Original Research Article

Correlation between maternal education and birth weight of the baby- A hospital-based study

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Abstract

Background: Present study was planned to find out the correlation between maternal education and birth weight of the baby. **Material and Method:** This cross sectional study was conducted at B.K.L. Walawalkar Rural Medical College, Chiplun. 508 mothers who were admitted in the postnatal wards during the study period of 1 year from April 2018 to March 2019 were included in the study. **Results:** In our study we found that rate of LBW babies was significant among uneducated women, it was almost 43.47% and as the level of education was increased the rate of LBW babies delivered was reduced, from 43.47% in uneducated women to 34.42%. **Conclusion:** There is strong correlation between maternal education and birth weight of a baby.
Key Words: Maternal education, Low birth weight.

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INTRODUCTION

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[1]. 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.[1] 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.[2] A recent Europe-wide systematic review of child cohort studies has demonstrated the link between maternal education, and the risk of preterm and small for gestational age (SGA) birth, among other markers of fetal growth. Inequalities have been reported among babies born to mothers with low levels of education in the UK, Denmark, Finland, Norway and Greece. These associations were inconclusive in the Netherlands and Sweden, and negligible in Ireland, Italy, Portugal and Spain.[3] Various mechanisms, such as older age at first birth, larger birth intervals, greater use of positive parenting practices, uptake of social and healthcare services, and fewer structural and material barriers, may benefit children of mothers with higher levels of education. These mothers may have an enhanced facility to navigate their familial and socioeconomic

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environment, and may live in better household-level and neighbourhood-level circumstances favourable to neonatal health.[3] Therefore the objective of present study is to find out the prevalence of low birth weight babies and its association with maternal education in this region, so that it will be helpful for improving health policies and programs to address this important health problem.[1]

MATERIALS AND METHODS

A hospital based cross-sectional study was conducted at B.K.L. Walawalkar Rural Medical College, Chiplun, during the study period of 1 year from April 2018 to March 2019. Sample size was determined by using the formula n=(z2×pq)/e2. Simple random sampling technique was used to collect the data. The total of 508 mothers who were admitted in the postnatal wards of B.K.L. Walawalkar Rural Medical College, Chiplun 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

A birth was considered to be appropriate for gestational age if the birth weight was between the 10th and 90th percentiles for the infant's gestational age and sex.[4] This cross sectional study was approved by institutional Ethical Committee of B.K.L. Walawalkar Rural Medical College, Chiplun 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

This work was carried out in the department of Pediatrics, B.K.L. Walawalkar Rural Medical College, Chiplun, over a period of 1 year. We screened 508 patients and data was analyzed. Present study shows that 65.35% mothers were educated up to high school, 12.40% were graduated and only 0.19% 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. 39.76% mothers were weighing between 40-49 Kg and Mean weight of the mother was 48.57 kg In the present study the mean birth weight was 2.49 kg. Total full term babies were 87.40% (444) there are 62.79% babies were full term AGA and 24.40% were full term SGA. Total preterm babies were 12.59% (64). 9.84% were preterm AGA and 1.96% were preterm SGA. In our study, we found that rate of LBW babies was significantly high among uneducated women. It was 43.47% and as the level of education increased, the rate of LBW babies delivered was reduced, from 43.47% in uneducated women to 34.42% and 0% in graduate and post graduate women respectively.

Table 1: MATERNAL EDUCATION

EDUCATION	FREQENCY	PERCENTAGE	Normal birth weight	LBW	VLBW	ELBW
Uneducated	23	4.5%	13	10 (43.47%)	0	0
Primary school	16	3.14%	9	7 (43.75%)	0	0
High school	332	65.55%	170	158 (47.59%)	4	0
Junior college	75	14.56%	48	26 (34.66%)	0	1
Graduation	6	12.40%	40	21 (34.42%)	0	0
Post-graduation	1	0.19	1	0 (0%)	0	0
TOTAL	**508**	**100%**	**281**	**222**	**4**	**1**

Table 2: MATERNAL HEIGHT (cms)

MATERNAL HEIGHT	FREQUENCY	PERCENTAGE
< 130	2	0.39%
130-13	7	1.37%
140-149	149	29.33%
150-159	295	58.07%
>160	55	10.82%
TOTAL	**508**	**100%**

Table 3: MATERNAL WEIGHT (Kgs)

MATERNAL WEIGHT	FREQUENCY	PERCENTAGE
< 40	28	5.5%
40-49	202	39.76%
50-59	189	37.20%
60-69	59	11.61%
70-79	20	3.93%
>80	10	1.9%
TOTAL	**508**	**100%**

	FREQUENCY	PERCENTAGE
FULL TERM AGA	319	62.79%
FULL TERM LGA	1	0.19%
FULL TERM SGA	124	24.40%
TOTAL FULL TERM BABIES	**444**	**87.40%**

	FREQENCY	PERCENTAGE
PRETERM AGA	50	9.84%
PRETERM LGA	4	0.78%
PRETERM SGA	10	1.96%
TOTAL PRETERM BABIES	**64**	**12.59%**

DISCUSSION

As proved in other studies[5,6,7] this study verified maternal education as an important socioeconomic factor related to the neonatal birth weight. A higher level of maternal education may be associated with higher family income and better nutrition of children, which may lead to improvement in infant birth weight. One possible explanation is that pregnant women with a higher level of education more easily changed their biological, psychosocial, and behavioral factors influencing pregnancy, including poor nutrition, smoking and physical labor, than women with a lower level of education[7,8]. 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 [9] Prenatal care disparities due to socioeconomic inequity such as education have been reported in developed countries as well as developing countries [3,10,]. Given the increases in prenatal care resources, there is also the unavoidable phenomenon of excessive use in low-risk mothers. Super-adequate care increased from 19.5% of pregnancies in 1985 to 30.0% in 2004 in the USA, existing in every stratum defined by maternal birthplace, race, age, education, gravidity, marital status, and multiple birth[11] 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[10]. This issue is particularly important to developing countries, in formulating applicable health-care policy to make full use of limited health resources to guarantee care for disadvantaged groups such as women with low educational attainment. In the present study of the 508 patients, 43.70% delivered LBW babies, that is, baby weight <2500gm This was very high in comparison with NFHS-3 data where the reported LBW was 23% in rural areas in India.[12] Other studies from Indian subcontinent also have documented almost similar percentage of LBW, 30.3% in Deshmukh *et al*. study,[13] Velankar[14] reported the incidence as high as 45.2%. Negi *et al*.[15]observed the incidence to be around 23.8% whereas; Trivedi and Mavalankar[16] and Kamaladoss *et al*.[17] 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. The mean birth weight in the present study was 2.49 kg which was low as compared to the study conducted by Negi *et al*. and Ramankutty *et al*. [15,18] The incidence of LBW was high in mothers of age 20 years or less as reported in various studies.[15,19] NFHS-3 also confirms that the proportion of births with a LBW is lesser among children born to older women (age at birth ≥20 years). These findings indicate prevention of teenage pregnancy to avoid LBW. Maternal education is one of the important factors affecting birth weight. Majority of the women in the present study had studied not more than

the high school, so we found that there is strong association between maternal education and LBW. As almost 73.19% (371) women were educated below high school and 78.82 % (175) LBW babies belong to this group. The duration of maternal education was found to be insignificant with the risk for LBW in Solanki *et al.* study.[19] On the other hand, Karim and Mascie-Taylor[20] found that birth weight increases with higher maternal education. Which is similar to this study but data is not mentioned here. GA <37 weeks has significant more chances for LBW babies. There are numerous reasons for low GA such as lack of adequate nutrition, low body mass index, high blood pressure, maternal anthropometry and age, and anemia. Hence, the study implies that women need to be careful of all these above factors so as to avoid LBW babies.

LIMITATIONS

This study was conducted only among institutional deliveries, so these findings cannot be truly representative of entire population.

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. Future studies are encouraged to investigate factors mediating the effects of socioeconomic inequality on birth outcomes for identifying the main target groups for interventions. 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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