



RELATIONSHIP OF BIRTH WEIGHT WITH MATERNAL PARAMETERS : A HOSPITAL BASED CROSS-SECTIONAL STUDY

Community Medicine

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ABSTRACT

Background: The first thing to reflect the health of a newborn child is the birth weight of the child. Low birth weight is associated with various adverse health outcomes. It's important to find out the determinants of the birth weight of the children so that those factors can be improved to have healthy babies with better life.

Objective: To find out the relationship of birth weight of children with various maternal parameters

Methods: This study was carried out in the department of paediatrics Government Medical College Srinagar for one month. It was a record based cross-sectional study.

Results: A total of 100 children were included. The mean birth weight of children was 2.9 Kg. Maximum children were male (64%), 40 % were of first birth order. About 44% mothers were illiterate. There was no significant difference in the birth weights of the children on the basis of sex ($p=0.58$), birth order ($p=0.34$), residence ($p=0.40$), socio-economic status ($p>0.05$), pre-pregnancy BMI of the mother ($p>0.05$), mother's age at birth of the baby ($p>0.05$). The birth weight of the children differed across the educational status categories ($p=0.005$) with maximum birth weight being in the children of most educated mothers.

Conclusion: The children whose mothers were most educated had more birth weight compared to others indicating that education is very important for all round development of the child which includes physical development.

KEYWORDS

Birth Weight, Maternal Parameters, Pre-pregnancy Bmi, Maternal Education

INTRODUCTION

The first thing to reflect the health of a newborn child is the birth weight. The ignorance regarding care during antenatal period leads to high prevalence of low birth weight (LBW) babies which is a major determinant of infant morbidity and mortality (Godfrey & Barker, 2018). Low birth weight (infants born weighing less than 2500 g) is associated with various adverse health outcomes. Existing literature has established the associations between LBW and infant mortality (Joseph & Kramer, 1997). Birth weight is one of the leading indicators of infant health and welfare and the main focus of infant health policy (Atuahene et al., 2015). The WHO has estimated that 17% of the babies born across the world are LBW with a wide gap between the incidence in developing (19%) and developed countries (7%). As per national family health survey-3 (NFHS-3) report, proportions of LBW babies in India were slightly higher in rural (23%) than for urban population (19%) with regional disparity as low as 8% in Mizoram to 33% in Haryana and 23.4% in Madhya Pradesh (International Institute for Population Sciences, 2007). The perinatal mortality is about eight times higher among LBW infants than that among normal birth weight babies (Verma et al., 2017). Its well established that the aetiology of low birth weight is multi-factorial with genetic, placental, fetal and maternal factors interplaying with each other. It is therefore imperative to identify risk factors for LBW in order to come up with effective and feasible interventional strategies to minimize the problem. Emphasis should be given to those factors which are amenable to change. Maternal determinants of birth weight are easy to find and easy to change as healthcare providers remain in direct contact with the mothers in antenatal period. Keeping the above points in mind, the present study was carried out.

OBJECTIVE

The objective of our study was to find out the relationship of birth weight of children with various maternal parameters

METHODOLOGY

This study was carried out in GB Pant hospital which is the pediatric hospital associated with Government Medical College Srinagar. It was a record based cross-sectional study. Those children whose parents provided informed consent were included in the study. It was an open sample with all those taken who were willing to participate during the one month posting in one of the pediatric wards. Data was collected only on 4 weekdays on which the ward was visited in the month of December 2018. Children with serious illnesses like cancers, genetic or congenital disorders were excluded from the study. Information was obtained from the mothers of the children. The demographic details,

birth order of baby, mother's education, mode of delivery, mother's age at birth of baby, the birth weight of children, age of the child, gestational age at which the child was born, and the weight of the mother in the pre-pregnancy period were taken from the records. If the record of mother's education or some of the demographic details were not found in the records, it was asked verbally from the mother.

STATISTICAL ANALYSIS

Data was analysed using SPSS version 23. Continuous variables were summarized as mean and standard deviation while categorical variables summarized as percentages. To assess the relationship of birth weight with sex, birth order and residence independent samples t test was done.

RESULTS

In the one month period we were able to collect data from a total of 100 children between 6 and 59 months of age. The mean birth weight of children was 2.9 Kg Table 1 describes the socio-demographic characteristics of the study population.

Table 1: Socio demographic characteristics of the study participants

Factor		Percentage of children
Sex	Male	64
	Female	36
Mode of delivery	Vaginal	55
	Caesarean section	45
Residence	Rural	60
	Urban	40
Socio Economic status	Upper middle	22
	Lower middle	32
	Upper lower	46
Birth order	First	40
	Second	40
	Third	13
	Fourth	7
Age-group	6-12 months	59
	13-59 months	41
Mother's education	Illiterate	44
	Primary	1
	Middle	19

	Secondary	19
	Graduate/postgraduate	17

of all the children, 64 % were male, 55% were born by normal vaginal delivery, 60% belonged to rural area, 46% belonged to upper lower class, 40% were of the first birth order, 59 % belonged to age group of 6 to 12 months. About 44% mothers were illiterate.

No statistically significant difference in the birth weights of the children on the basis of sex ($p=0.58$), birth order ($p=0.34$), residence ($p=0.40$) was found as shown in Table 2.

TABLE 2: Relationship of birthweight with sex of the child, birth order and residence

SEX	Number	Mean birth weight in Kgs	P value on independent samples t- test
Male	64	2.90	0.58
Female	36	2.84	
BIRTH ORDER			
1 st	40	2.81	0.34
2 nd or more	60	2.93	
RESIDENCE			
Rural	60	2.84	0.40
Urban	40	2.94	

Also no significant difference in birth weight of children was found on the basis of socio-economic status ($p>0.05$) and pre-pregnancy BMI of the mother ($p>0.05$). But mother's education showed a significant relationship with birth weight of the child ($p=0.005$) as shown in Table 3.

TABLE 3: Relationship of birthweight with Socio economic status, Pre-pregnancy BMI of the mother and Mothers education

Socio economic status*	Number	Mean birth weight in Kgs	ANOVA	
			F	p value
Upper Middle	22	2.92	0.64	0.52
Lower Middle	32	2.95		
Upper Lower	46	2.81		
Pre-pregnancy BMI of the mother				
<18.4	19	2.76	0.41	0.79
18.5-22.9	42	2.86		
23-24.9	18	3.00		
25-29.9	17	2.93		
30	4	2.90		
Mothers education			3.64	0.005
Illiterate	45	2.75		
Middle	19	2.76		
Secondary	19	3.26		
Higher Secondary	10	2.70		
Grad/PG	7	3.30		

*None of the children were from the upper class. Modified Kuppaswamy scale was used.

Table 4 shows the relationship between birth weight of the children and mother's age at birth of the baby.

TABLE 4: Relationship of birth weight of the children with mother's age at birth of the baby

		Birthweight
Mother's age at birth of the baby	Correlation co-efficient	0.10
	Pvalue	0.30

No relationship was found between birth weight of the children and mother's age at the birth of baby.

DISCUSSION

Maximum birth weight was of the children whose mothers were most educated. This finding is scientifically proven and is also in concordance with previous studies (Chevalier et al., 2007). This shows that education is very important for all round development of the child including indirectly the intra-uterine development. There was no significant difference in the birth weights of the children on the basis of sex ($p=0.58$), birth order ($p=0.34$), residence ($p=0.4$), socio-economic status ($p>0.05$), pre-pregnancy BMI of the mother ($p>0.05$), mother's age at birth of the baby ($p>0.05$).

Education of mothers may modify the budget constraint by helping mothers in decision making, timing and number of children so that more educated mothers would have more resources per child. Hence, maternal education can undo or at least minimise the adverse effect of low income. Also maternal education is a determinant of maternal health affecting her reproductive capacity and her ability to physically cope with pregnancy.

A study conducted by Arnaud Chevalier Vincent O'Sullivan, found that one year of maternal education reduces both the probabilities of low birth weight and premature birth by one percentage point. It could be attributed to changes in the following behaviour: reduction of smoking during pregnancy due to education (-6 percentage points), and increase in pre-natal care (+2.5) and partnership (+1.3). Education thus improves infant health (Chevalier et al., 2007).

Since the study period of our study was short and the data collection was done from a single ward, the sample of our study was small. We did not collect the data from out-patient department due to time constraints as huge number of patients visit the OPD in a few hours. Due to small sample some significant maternal determinants of birth weight of children e.g., pre-pregnancy BMI of the mother, may have been missed (Abubakari et al., 2015).

CONCLUSION

The children whose mothers were most educated had more birth weight compared to others indicating that education is very important for all round development of the child which includes physical development.

We recommend that measures must be taken to improve female literacy so that they take good care of themselves in pregnancy and are compliant to the advices given which is important for better foetal outcome including the weight of the newborn. Also it is recommended to further conduct more studies in this field so that our understanding of maternal indicators of birth weight of newborn gets further improved.

REFERENCES

1. Abubakari, A., Kynast-Wolf, G., & Jahn, A. (2015). Maternal Determinants of Birth Weight in Northern Ghana. PLoS ONE, 10(8). <https://doi.org/https://doi.org/10.1371/journal.pone.0135641>
2. Atuahene, M., Mensah, D., & Adjuk, M. (2015). A cross-sectional study of determinants of birth weight of neonates in the Greater Accra region of Ghana. Maternal Health, Neonatology and Perinatology, 1-8. <https://doi.org/10.1186/s40748-015-0023-4>
3. Chevalier, A., Sullivan, V. O., Chevalier, A., & Sullivan, V. O. (2007). Mother's Education and Birth Weight. 2640.
4. Godfrey, K. M., & Barker, D. J. P. (2018). Fetal nutrition and adult disease 1 - 3. 71(March), 1344-1352.
5. International Institute for Population Sciences. (2007). National Family Health Survey (NFHS-3), 2005-06: India: Volume I. In International Journal of Health Care Quality Assurance (Vol. 18, Issue 7). <https://doi.org/10.1108/ijhcqa.2005.06218gab.007>
6. Joseph, K. S., & Kramer, M. S. (1997). Recent trends in infant mortality rates and proportions of low-birth-weight live births in Canada.
7. Verma, R., Kumar, M., Bhalla, K., Kumar, R., Dhaka, R., & Chayal, V. (2017). Maternal determinants of low birth weight in a rural block of Haryana: a community based study. International Journal Of Community Medicine And Public Health, 4(9), 3360. <https://doi.org/10.18203/2394-6040.ijcmph20173845>