



A STUDY ON MATERNAL FACTORS AFFECTING LOW BIRTH WEIGHT IN INSTITUTIONAL DELIVERIES AT IGIMS, PATNA

Community Medicine

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ABSTRACT

Introduction: The birth weight of an infant is the single most important determinant of its chances of survival, health, growth and development, nearly 15 percent of baby born worldwide are low birth weight. Low birth weight is one of the most serious challenges in maternal and child health in both developed and developing countries.¹ 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.² It is a reliable indicator in monitoring and evaluating the success of maternal and child health programmes.³ The low birth weight is considered as sensitive index of nation's health and development.⁴ The incidence of low birth weight is much higher in developing country compared to developed country. The low birth weight (LBW) is a major public health problem in India which needs to be addressed on an urgent basis. The present study was undertaken to know the incidence of LBW and maternal factors affecting birth weight.

Methodology: This study was a hospital based cross-sectional study at IGIMS, PATNA. A total of 200 mothers were included in the study. Information was collected from the mothers by pre tested semi structured questionnaire. Data was analysed by preparing master table and represented in the form of tables.

Results: The incidence of LBW was found to be 21.3%. In the present study maternal factors like education, nutritional status, knowledge regarding maternal nutrition, haemoglobin status, multigravida, spacing, weight gain during pregnancy has got significant association in determining the birth weight of the baby.

KEYWORDS

Haemoglobin status of mother, Low birth weight, Maternal nutrition, Mother's education, Normal birth weight, Spacing, Weight gain

INTRODUCTION:

The low birth weight is defined by the World Health Organization (WHO) as weight at birth less than 2500 g (5.5 lb). Low birth weight continues to be a significant public health problem globally and is associated with a range of both short- and long-term consequences. Overall, it is estimated that 15% to 20% of all births worldwide are low birth weight, representing more than 20 million births a year. The goal is to achieve a 30% reduction in the number of infants born with a weight lower than 2500 g by the year 2025 (1). There is considerable variation in the prevalence of low birth weight across regions and within countries; however, the great majority of low-birth-weight births occur in low- and middle-income countries and especially in the most vulnerable populations (6, 7). Regional estimates of low birth weight include 28% in south Asia, 13% in sub-Saharan Africa and 9% in Latin America. It is worth noting that these rates are high, in spite of the fact that the data on low birth weight remain limited or unreliable, as many deliveries occur in homes or small health clinics and are not reported in official figures, which may result in an underestimation of the prevalence of low birth weight. The incidence of LBW varies widely between regions of the world, with levels of 32% in Southern Asia, 9% in Eastern Asia, 11-16% in Africa and 10-12% in Latin America and Caribbean's. In India, 27% babies are low birth weight and more than half of these are full term babies.

LBW is a multifaceted problem that may result in a wide spectrum of diseases in later life such as hypertension, ischemic heart disease, stroke, metabolic syndrome, diabetes, malignancies, osteoarthritis and dementia.⁵ LBW babies are at an increased risk of asphyxia, hypoglycaemia, polycythaemia-hyper viscosity and hypothermia.⁶ Low birth weight infants are also at increased risk of long-term disability and impaired development like delayed motor and social development. LBW also increases a child's likelihood of having a school-age learning disability, being enrolled in special education classes, having a lower IQ, and dropping out of high school. Being born with a low birth weight also incurs enormous economic costs, including higher medical expenditures, special education and social service expenses, and decreased productivity in adulthood.⁷

The causes of LBW are multi-factorial and birth weight is determined by the interaction of both socio-demographic and biological factors. Low birth weight in developing countries occurs primarily because of poor maternal health and nutrition. Low birth weight which is related to maternal malnutrition, is a causal factor in 60-80 per cent of neonatal deaths.

LBW also reflects inadequate nutrition and ill health of the mother. There is a strong and significant positive correlation between maternal factors and birth weight of the babies. Thus, birth weight is important; hence the present study was carried out to identify maternal factors associated with low birth weight. Therefore, the objective of present study is to find out the prevalence of low birth weight babies and its association with socio-cultural and maternal risk factors in this region, so that it will be helpful for improving health policies and programmes to address this important health problem.

OBJECTIVES:

1. To know the incidence of Low Birth weight in institutional deliveries at IGIMS, PATNA.
2. To study the association between maternal factors and birth weight.

MATERIALS AND METHODS

The present study was a hospital based cross sectional study conducted at *Indira Gandhi Institute of Medical Science Patna*. The data was collected in the months of April 2019 to July 2019 from the randomly selected post-natal mothers with the help of pre tested semi structured questionnaire till the sample size 200 was achieved. The baby birth weight was taken within half an hour after birth. Mothers were interviewed within six hours of delivery and also the available health records with the mother were reviewed. The data was analysed by preparing master table. The results were represented in the form of tables and statistical tests like Odds ratio, Chi square test and Standard error of proportion were done to know the association between maternal factors and birth weight.

RESULTS:

The results of the study were analysed as follows. Total number of mothers interviewed were 200. Out of which, 17 mothers had still birth and they were excluded while analysing the results. Finally, the analysis was done for 183 mothers.

In the present study the incidence of low birth weight was found to be 21.3% which was below national average (27%) (Table no. 1)

Table no 1: Distribution of babies according to birth weight

Birth weight	Number of Babies (%)
< 1500 gms	2 (1.09%)
1500 – 2499 gms	37 (20.2%)
>2500 gms	144 (78.6%)
Total	183(100%)

In the present study there was no significant relationship between age of the mother and birth weight of the baby. As educational status of the mother was increasing the incidence of low birth weight was decreasing and was found to be statistically significant. The incidence of Low birth weight was 1.2 times (OR) higher in mothers from below poverty line families than above poverty line. The height of the mother, consanguineous marriages and Rh incompatibility got no influence on the birth weight of the baby. The incidence of low birth weight was 7.6 times (OR) higher in mothers having good nutritional status (BMI

>18.5). There was a significant association between knowledge on nutrition in the mother and birth weight of the baby. As the spacing between the pregnancies was more than 3 years the incidence of Low birth weight was decreasing and it was found to be statistically significant. Weight gain of the mother during antenatal period and Haemoglobin status of the mother has got significant influence on the birth weight of the baby. The incidence of Low birth weight was less in mothers having no Bad obstetric history (20%) than mothers having Bad obstetric history (29%) and was not statistically significant (Table no. 2)

Table no 2: Association between Low birth weight and maternal factors

	LBW	NBW	Total	
Age				
< 20 years	5 (20.8%)	19 (79.2%)	24 (100%)	P > 0.05
> 20 years	34 (21.4%)	125 (78.6%)	159 (100%)	
Mothers education				
Illiterate	14	25	39	P < 0.02
Primary	11	49	60	X ² = 7.8
Secondary & above	14	70	84	df = 2
Economic status				
BPL	33 (21.8%)	118 (78.2%)	151 (100%)	OR = 1.2
APL	6 (18.75%)	26 (81.25%)	32 (100%)	
Height of mother				
< 145 cms	0 (0%)	2 (100%)	2 (100%)	P > 0.05
> 145 cms	39 (21.5%)	142 (78.5%)	181 (100%)	
H/o consanguinity				
Yes	10 (20.4%)	39 (79.6%)	49 (100%)	P > 0.05
No	29 (21.6%)	105 (78.4%)	134 (100%)	
Nutritional status				
< 18.5	2 (66.6%)	1 (33.3%)	3 (100%)	OR = 7.6
18.5 - 24.9	37 (20.7%)	141 (79.3%)	178 (100%)	
≥ 25	0 (0%)	2 (100%)	2 (100%)	
Knowledge on nutrition				
Present	6 (8%)	68 (92%)	74 (100%)	P < 0.05
Absent	33 (30%)	76 (70%)	109 (100%)	SEP = 4.07
Hb % status of mother				
< 10 gm%	38 (22.6%)	130 (77.3%)	168 (100%)	P < 0.05
> 10 gm %	1 (6.6%)	14 (93.4%)	15 (100%)	SEP = 2.2
Hypertension				
Normal	37 (20.5%)	143 (79.5%)	180 (100%)	P > 0.05
Abnormal	2 (66.7%)	1 (33.3%)	3 (100%)	SEP = 1.6
Spacing				
< 3 years	32 (19.5%)	132 (80.5%)	164 (100%)	P < 0.05
> 3 years	7 (37%)	12 (63%)	19 (100%)	SEP = 3.6
Gravida				
1	22 (22%)	77 (78%)	99 (100%)	
2	12 (18%)	53 (82%)	65 (100%)	
3	2 (15%)	11 (85%)	13 (100%)	
4	3 (60%)	2 (40%)	5 (100%)	
5 & above	0 (0%)	1 (100%)	1 (100%)	
Weight gain during pregnancy				
≤ 4 kg	0	0	0	
4-7 kg	4 (66.6%)	2 (33.3%)	6 (100%)	
7-10 kg	35 (33%)	71 (67%)	106 (100%)	
> 10 kg	0 (0%)	77 (100%)	77 (100%)	
Bad obstetric history				
Present	9 (29%)	22 (71%)	31 (100%)	
Absent	30 (20%)	122 (80%)	52 (100%)	

OR=odds ratio, SEP= standard error of proportions

DISCUSSION

The incidence of LBW in the present study was found to be 21.3% which was below national average (27%). This was comparable to study conducted by SK Azimul et al¹ 2009 in urban area of Bangladesh (23.2%). This incidence was low when compared to studies conducted by HS Joshi et al² at Allahabad (34.37%) and Malik S et al at Mumbai³ (28.3%). The incidence of LBW was high in tribal (37.5%) and rural (25%) when compared to urban areas (18%). These results were compared to study conducted by MM Nagorjoji et al⁴ in Nagapur (OR=2.06).

The incidence of LBW was 36% in illiterates followed by 18% with primary and 16% with secondary education. A study conducted by

Haley. D. Jackson et al⁵ at Georgia has also found that maternal education of 12th grade or less (OR=1.7) was associated with LBW. Socio-economic status has got influence on the birth weight of the baby in the present study (OR=1.2). A study conducted by SK. Azimul et al¹ at Bangladesh had also found that socio economic status was a significant risk factor for LBW.

In the present study the incidence of LBW was 7.6 times higher in mothers having BMI < 18.5. Similar findings were observed by Kiran Agarwal et al⁶ at Uttar Pradesh they had found that mother's weight < 50 kgs; height < 150 cm are significant determinants of LBW. In the present study the incidence of LBW was 66.7% in hypertensive mothers and was not statistically significant. This was not comparable to other studies. In a study conducted by Dileep. V. Mavalankar et al⁷ at Ahmedabad observed that hypertension was significant independent risk factor for both term and preterm LBW.

In the present study anemia has got significant influence on the birth weight of the baby. Similar findings were observed by Dileep.V. Mavalankar et al⁷ at Ahmedabad. In a study conducted by Kiran Agarwal et al⁶ at Uttar Pradesh observed that Hb% less than 10 gm/dl was significant determinant of LBW. A study conducted by MM Nagargoji et al⁴ at Nagpur observed that Hb% <10 gm% was significantly associated with LBW.

In the present study there was no significant relationship between age of the mother and birth weight of the baby. But in other studies, it was found that there was a significant relationship between age and LBW. A study conducted by Malik S et al² in Mumbai observed that a strong correlation between age and birth weight of the baby. A study conducted by SK Azimul et al¹ at Bangladesh also observed that there was a significant relationship between age and birth weight of the baby. In the present study as education of the mother was increasing the incidence of LBW was decreasing and was found to be statistically significant. Similar findings were observed by Biswas R. et al⁸ at West Bengal.

The incidence of LBW was high in mothers having birth interval less than three years and was found to be statistically significant. A study conducted by SK Azimul et al¹ at Bangladesh also observed that there was a significant relationship between birth weight and interval between pregnancies. A study conducted by MM Nagargoji et al⁴ at Nagpur has also observed that birth interval <24 months (OR=1.81) was significantly associated with LBW.

In the present study the incidence of LBW was increasing with gravida four and above. In the present study 29% of the mothers who delivered LBW baby had a history of bad obstetric history when compared to mothers who delivered LBW baby only 20% had bad obstetric history. In a study conducted by MM Nagargoji et al⁴ at Nagpur has observed that maternal factor like unfavorable outcome of previous pregnancy (OR=2.47) was significantly associated with LBW.

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