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A study on maternal factors affecting Low Birth Weight in Institutional deliveries

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Abstract:
Introduction: *Low birth weight (LBW) is a major public health problem which needs to be addressed on an urgent basis. Data on low birth weight is important for several reasons;* ***rational*** *and regional estimates of the incidence of LBW are internationally recognized indicators of the well-being of neonates and women of reproductive age. 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 King George Hospital, Visakhapatnam. A total of 200 mothers were included in the study. Information was collected from the mothers by pre tested semi structured questionnaire. Data was analyzed 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.*
Key words: *Haemoglobin status of mother, Low birth weight, Maternal nutrition, Mother's education, Normal birth weight, Spacing, Weight gain*

I. Introduction:

WHO estimates that globally about 25 million LBW babies are born each year, consisting 17% of all live births, nearly 95% of them in developing countries. 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 one of the most serious challenges in maternal and child health in both developed and developing countries. Its public health significance may be ascribed to numerous factors. Its incidence, its association with mental retardation and high risk of perinatal, infant mortality and morbidity.

LBW babies are 5-6 times more likely to die during perinatal period and 3 times more likely to die during infancy compared to normal birth weight babies. LBW accounts for about $2/3^{rd}$ of all perinatal deaths and $1/3^{rd}$ of infant deaths. Thus it is obvious that LBW is responsible for high perinatal and infant mortality.

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.

Objectives:
1. To know the incidence of Low Birth weight in institutional deliveries.
2. To study the association between maternal factors and birth weight.

II. Methodology:

The present study was a hospital based cross sectional study conducted at King George Hospital, Visakhapatnam a major city in Andhra Pradesh. The data was collected in the months of April and May 2011 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. Consent was taken from the Institutional Ethics Committee before starting up of the study and informed consent was taken from the study population, who are willing to participate. Mothers who were not willing to participate and who has multiple pregnancies were excluded from the study. 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.

III. Results

The results of the study were analysed as follows. Total number of mothers interviewed were 200. Out of which, 17 mothers had still births 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%)	71 (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

IV. 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 al [1] 2009 in urban area of Bangladesh (23.2%). This incidence was low when compared to studies conducted by HS Joshi et al[2] at Allahabad (34.37%) and Malik S et al at Mumbai [3] (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 Nagorgoji et al[4] 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 al [5] 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 al [1] 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 al [6] at Uttar Pradesh they had found that mothers 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 al [7] 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 al[7] at Ahmedabad. In a study conducted by Kiran Agarwal et al [6] at Uttar Pradesh observed that Hb% less than 10 gm/dl was significant determinant of LBW. A study conducted by MM Nagargoji et al[4]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 al [2] in Mumbai observed that a strong correlation between age and birth weight of the baby. A study conducted by SK Azimul et al [1] 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 al [8] 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 al [1] at Bangladesh also observed that there was a significant relationship between birth weight and interval between pregnancies. A study conducted by MM Nagargoji et al [4] 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 NBW baby only 20% had bad obstetric history. In a study conducted by MM Nagargoji et al [4] 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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