

ORIGINAL RESEARCH

A Hospital Based Observational Study of Maternal and Socio-Economical Factors in Relation to Low Birth Weight Babies (LBWB)

¹Brajesh Kumar Singhal, ²Vijay Singh

¹Junior Specialist, ²Senior Specialist & Head, Department of Pediatrics, Government District Hospital, Dholpur, Rajasthan, India

Correspondence:

Vijay Singh

Senior Specialist & Head, Department of Pediatrics, Government District Hospital, Dholpur, Rajasthan, India

E mail:drvijay63@gmail.com

ABSTRACT

Background: Birth weight should preferably be measured within the first hour of life for live births, before significant postnatal weight loss has occurred. The socio-economic factors associated with LBW are income, level of education in the mother and other family members, occupation of the mother, household leadership and gender differences related to roles within the family. The aim of this study to assess the socioeconomic and maternal reproductive factors related to Low Birth Weight (LBW) of babies delivered in district hospital in Rajasthan.

Material & Methods: A prospective observational study was conducted in the Department of Pediatrics, District hospital, Dholpur, Rajasthan, India during one year period. Consent was taken from every mother before interview and the weight of the newborn was taken within the 24 hours of delivery and each questionnaire was completed. Record review format was used for reviewing antenatal care cards. Data was compiled in Statistical Package for Social Sciences (SPSS) software version 22.0 and analyzed.

Results: A total of 800 birth occurred during the study period, of which 280 met the inclusion criteria. Out of which 80 were LBW and 200 were normal birth weight (NBW). Hence, the prevalence of LBW in this present study was found to be 28.57 %. The univariate analysis of maternal factors associated with LBW. The factors associated with LBW included age, education, family members, gravida, antenatal care smoking and alcohol. The following variables were found insignificant: religion, residence, occupation, family type, abortion, and gestational age at 1stANC visit.

Conclusion: We concluded that a number of factors play a role in determining a baby's birth weight. Social factors (mother's age, level of education and economic status) and maternal care are very important.

Keywords: LBWB, NBW, Socioeconomic Factor, Maternal Factor.

INTRODUCTION

Birth weight is an important determinant of an infant's survival and future development.¹ Birth weight should preferably be measured within the first hour of life for live births, before significant postnatal weight loss has occurred. In 1976, the 29th World Health Assembly agreed on the following definition of low birth weight that "Low birth weight is a weight at birth of less than 2500gms (up to and including 2499) irrespective of gestational age". This replaced the earlier definition of 2500gms or less.²⁻⁴

Globally, LBW contributes to 40–60% of newborn mortality.⁵ LBW can be caused by preterm birth or by intrauterine growth restriction. The latter group is also referred to as small for gestational age (SGA) babies. In developing countries from Asia, LBW is largely attributed to intrauterine growth retardation as compared to prematurity in developed and African countries.⁶

Low birth weight has been used as an important public health indicator. The mortality rate rapidly increases as the birth weight decrease and most of infants weighing 1000 grams or less.⁷ The high prevalence of LBW contributes to the high perinatal, neonatal and infant mortality and is a common feature of many developing countries, especially in South Asia where the incidence ranges from 20-30%.

The biological processes that affect the fetus in utero are related to the mother's physiology, including her nutrition (mother's weight before pregnancy and history of having newborns with LBW), exercise, infection and consumption of alcohol, tobacco, teenage pregnancy, poor antenatal care, education other drugs.⁸ Four antenatal visits have been recommended by WHO technical group committee for women with normal pregnancy. The socio-economic factors associated with LBW are income, level of education in the mother and other family members, occupation of the mother, household leadership and gender differences related to roles within the family.^{9,10} The aim of this study to assess the socioeconomic and maternal reproductive factors related to Low Birth Weight (LBW) of babies delivered in district hospital in Rajasthan.

MATERIALS & METHODS

A prospective observational study was conducted in the Department of Pediatrics, District hospital, Dholpur, Rajasthan, India during one year period. Consent was taken from every mother before interview and the weight of the newborn was taken within the 24 hours of delivery and each questionnaire was completed. Record review format was used for reviewing antenatal care cards.

Mothers along with single live newborn delivered in hospital were included in the study. Mothers who had given multiple births or still birth baby and mother having disease during pregnancy and refusing to give consent were excluded from the study.

Birth weight was measured by the study investigators using a digital non-hanging type salter scale and rounded to the nearest 10 grams. The instrument was calibrated each time before use with a standard 1 kilogram weight. Data was compiled in Statistical Package for Social Sciences (SPSS) software version 22.0 and analyzed. Simple descriptive analysis, chi-square test was used to determine the risk factors.

RESULTS

A total of 800 birth occurred during the study period, of which 280 met the inclusion criteria. Out of which 80 were LBW and 200 were normal birth weight (NBW). Hence, the prevalence of LBW in this present study was found to be 28.57 %.

Table 1 and 2 depicts the results of univariate analysis of maternal factors associated with LBW. The factors associated with LBW included age, education, family members, gravida, antenatal care smoking and alcohol. The following variables were found insignificant: religion, residence, occupation, family type, abortion, and gestational age at 1stANC visit.

Table 1: Effects of Maternal Factors on Birth Weight of Newborn

Variables	LBW (N=80)	NBW (N=200)	Total (N=280)	P-value
Maternal Age (yrs)				
<20 yrs	34	26	60	<0.05*
20-25 yrs	27	88	115	
26-30 yrs	12	26	38	

>30 yrs	7	60	67	
Sex of child				
Male	48	112	160	>0.05
Female	32	88	120	
BMI of Mother				
<18.5 kg/m ²	24	6	30	<0.05*
18.5-24.99 kg/m ²	50	142	192	
>25 kg/m ²	6	52	58	
Gravida				
1 st	47	101	148	<0.05*
2-3	32	82	114	
>4	1	17	18	
Previous abortion				
Yes	6	10	16	>0.05
No	74	190	264	
Folic acid & iron tablets				
Yes	68	186	254	>0.05
No	12	14	26	
Smoking				
Yes	13	5	18	<0.05*
No	67	195	262	

Table 2: Effects of Socioeconomic Factors on Birth Weight of Newborn

Variables	LBW (N=80)	NBW (N=200)	Total (N=280)	P-value
Religion				
Hindus	58	184	242	>0.05
Muslims	20	10	30	
Others	2	6	8	
Education				
Illiterate	30	140	170	<0.05*
Primary	35	15	50	
Secondary	10	30	40	
Higher	5	15	20	
Occupation of mother				
House wife	50	150	200	<0.05*
Farmers	25	25	50	
Others	5	25	30	
Economic status				
Lower	68	132	130	<0.05*
Lower middle	8	32	40	
Lower upper middle	3	27	30	
Middle upper	1	9	10	
Residence				
Rural	70	150	220	>0.05
Urban	10	50	60	

DISCUSSION

Low birth weight (LBW) is one of the key reproductive health indicators whose outcome is influenced by consumption of reproductive health care. In most of the third world countries including developing country like ours the incidence of low birth weight is high. The problem of low birth weight needs to be addressed on priority basis as children are the future of the country. Low birth weight neonates need special care since they have increased risk of mortality and long term morbidity. Globally, about one sixth of all newborns are low birth weight, which is the single most important underlying risk factors for neonatal deaths.¹¹

The study conducted to analyze various parameters causing and affecting low birth weight determined that preterm birth was the most important determinant of the LBW. According to the results, 28.57% of the babies born were small for gestational age.

LBW frequency decreases with the increase in the maternal education. 37.5% of LBW babies' mother were uneducated. Further it was found that as the level of education of mother increases, the occurrence of the LBW successively decreases i.e. 43.75 % were educated up to primary, 12.5% were qualified up to secondary, 6.25 % were qualified to Higher Level of education. The above statistics could be due to the reason that uneducated mother is uninformed about the prenatal care, nutritional requirements during pregnancy, essential diet, and about the effects of maternal behavior on fetus. Malnutrition during pregnancy leads to the occurrence of LBW babies. It was evident from analysis that mothers from lower economic status were more likely to have LBW newborn than those who came from higher social class. The mother with low socio-economic status were 85 % and were at higher risk of delivering LBW baby. As the level of socio-economic status increases the occurrence of the LBW decreases. These statistics could be due to the reason that mother in higher socioeconomic class were having healthy surroundings and had healthy diet to produce heavier babies whereas the mothers in deprived socioeconomic level i.e. unhygienic environment and improper diet were at higher risk of having a low birth weight baby which was similar to the study done by Karim et al. (1997)¹².

The study showed that age of mother was directly proportionate to deliveries associated with LBW. Most of the mother of LBW babies in this study belonged to the age <20 and ≥35 yrs (p -value <0.05) which was similar to study done by Khatun et al. (2008).⁹ The incidence of LBW was higher among smoker mother as compared to non-smoker mothers (16.25% vs 83.75% respectively). This finding was similar to study done by Dickute et al. (2002)¹³.

CONCLUSION

We concluded that a number of factors play a role in determining a baby's birth weight. Social factors (mother's age, level of education and economic status) and maternal care are very important. Therefore, it is prudent to identify the risk factors that cause LBW in newborns and to control them quickly and information about LBW's social and economic decisions can lead to better evidence-based interventions to reduce infant mortality.

REFERENCES

1. Wilcox AJ. On the importance—and the unimportance—of birth weight. *International Journal of Epidemiology*. 2001; 30: 1233–41.
2. Lawn JE, Cousens S, Zupan J. Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: when? Where? Why? *Lancet* 2005; 365: 891-900. SS.
3. Haque F, Hussaian AM: Detection of low birth weight babies by anthropometric measurements in Bangladesh. *Indian J Pediatr* 1991; 58: 223-31.
4. Sood SL, Saiprasad GS, Wilson CG. Mid arm circumference at birth: a screening method for detection of low birth weight. *Indian J Pediatr* 2002; 39: 838-42.

5. UNICEF (2009) The state of the world's children 2009: maternal and newborn health: United Nations Children's Fund.
6. Villar J, Khoury MJ, Finucane FF, Delgado HL. Differences in the epidemiology of prematurity and intrauterine growth retardation. *Early Human Development*.1986; 14: 307–20.
7. Cormic MC. The contribution of low birth weight to infant mortality and childhood morbidity. *N Engl J Med*1985;312: 82-9.
8. Kennedy BP, Kawachi I, Glass R, Prothrow-Stith D. Income distribution, socioeconomic status and self rated health in the United States: Multilevel analysis. *Br Med J* 1998;317:917-21.
9. Khatun S, Rahman M. Socio-economic determinants of low birth weight in Bangladesh: A multivariate approach. *Bangladesh Med Res Counc Bull* 2008;34:81-6.
10. Elshibly EM, Schmalisch G. The effect of maternal anthropometric characteristics and social factors on gestational age and birth weight in Sudanese newborn infants. *BMC Public Health* 2008;8:244.
11. WHO. Perinatal mortality: a listing available information. FRH/MSM.96.7.Geneva:WHO; 1996.
12. Karim E, Mascie-Taylor CGN. The association between birthweight, socio-demographic variables and maternal anthropometry in an urban sample from Dhaka, Bangladesh. *Annals HumBio*1997;24:387-401.
13. Dickute J, Padaiga Z, Grabbauskas V, Gaizauskiene A, Basyas V, Obelenis V. Do maternal social, health behaviour and working conditions during pregnancy increase the risk of low birth weight in Lithuania? *Medicina*2002;38:321-32.