Original Article

Socioeconomic and Reproductive Factors Related to Low Birth Weight Babies

*Arun Giri[1], Raju Sedhain[2]
[1]Department of Pediatrics, Nobel Medical College Teaching Hospital, Biratnagar
[2]Pediatrician, Hetauda Hospital, Hetauda

Abstract
Background
Birth weight is a major determinant of morbidity, mortality and disability in neonates and children. Low birth weight (LBW) is associated with high morbidity, mortality and lifelong consequences. Hence, it is prudent to identify the risk factors causing LBW neonates and manage them promptly.
Material and Methods
This study was conducted at Nobel Medical College Teaching Hospital (P.) Ltd.which included term singleton neonates born via normal vaginal route without gross congenital anomalies and sickness at birth. Birth weight of neonate and mother's socioeconomic and reproductive history was taken within 24 hrs of birth.\
Results
There were 429 infants with birth weight ranging from 1500 gm to 4000 gm with mean birth weight of 2815.84 gm. The incidence of LBW was 21.9% (n = 105). Body Mass Index at first Ante Natal Visit (ANV), mother's age, occupation, smoking, history of abortion and last pregnancy interval were the most important associated variables for LBW.
Conclusion
Better nutrition during pregnancy, better education of mothers, avoidance of smoking, regular ANV and early commencement of ANV, increasing birth spacing and iron and folic acid supplementation will decrease the incidence of LBW and its consequences.

Key Words: _Antenatal visits, Low birthweight (LBW), Neonatal mortality_

Introduction
The first weight of newly born baby taken after birth is the birth weight. For those born alive, measurement of the birthweight should be done within the first hour of life, before the baby loses significant weight in the immediate postnatal period. 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 2,500g (up to and including 2499) irrespective of gestational age".

Birth weight is an important indicator of child survival. Appropriate and timely care of a new born especially if he/she is born with low birth weight is important but this is difficult in developing countries since most of the deliveries are conducted at home where adequate facilities to weigh a newborn do not exist [1].One of the most dependable and sensitve predictors

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*Correspondence Address: _Dr.Arun Giri, Lecturer_ | E-mail: drarungiri@hotmail.com

of community health is the birth weight [2]. It is estimated that 18 million babies are born with low birth weight and half of them are born in south Asia [3]. The estimates of prevalence of LBW in Nepal have ranged from 14% in community based studies to 32% in hospital based ones, overall being 27%.

The babies born with low birth weight have almost 40 folds more chances of dying during the neonatal period when compared to those born with normal birth weights. Two third of the neonatal deaths accounts to babies with birthweight ≤ 2.5 kgs and about half of the deaths accounts to those weighing ≤ 1.5 kgs [3]. In most of the countries both biological and service related factors have a significant impact on birth weight. Of these factors, teen pregnancy, poor antenatal care and maternal under nutrition, education may play pivotal roles in causing LBW. An association between lack of prenatal care and adverse outcomes of pregnancy such as perinatal and maternal mortalities, preemies and LBW have been shown by many studies.

This study was conducted to identify the mothers socioeconomic and reproductive factors which are directly and indirectly related to the LBW babies.

Material and Methods

This cross-sectional observational study was conducted at Nobel Medical College Teaching Hospital Pvt. Ltd. Hospital, Biratnagar, Nepal from June 2013 to July 2013and the principal focus of this study was to ascertain the significant determinants for LBW. This study included 479 term singleton neonate born via normal vaginal route without gross congenital anomalies and sickness at birth.

The detailed socioeconomic and obstetric history was obtained from mother and father (if present). Information gathered were: Hospital number , 1stday of LMP, weight of mother at the time of first antenatal visit(taken from the ANC card),

mother's height, sex of the child (in grams), date of delivery, gravid of mother, and para, mother's age, resident of mother, mother's education and occupation, monthly income, number of family members, type of family she is living with, religion, smoking habit, alcohol intake or not, dietary habit , any death of previous child, previous abortion or still birth, number of antenatal visits, time of first antenatal visit, the last pregnancy she had and iron and folic acid supplementation.

Weighing of all the neonates was done before 24hrs of birth by an electronic weighing scale manufactured by Phoenix Company (in India with collaboration), which had sensitivity up to 10 grams.

Results

There were 236(49.3%) male and 243(50.7%) female infants. The birth weight ranged from minimum 1500 gm to maximum of 4000 gm with mean birth weight of 2815.84 gm. The incidence of LBW was 21.9% (n = 105). Among different possible risk factors studied and analyzed, female sex of new born, body mass index of mother at first antenatal visit, age of the mother, residence, education, income, occupation, income, family type and number of family members, smoking habit, history of previous abortion, number of antenatal visits, time of commencement of first antenatal visit, interval between the current and previous pregnancy and supplementation with iron and folic acid during pregnancy were significantly associated with the incidence of LBW. Alcohol intake by mother, dietary habit of mother, history of death of previous child was found to be statistically insignificant. After doing adjustments for the confounding variables by the logistic regression analysis, BMI at first antenatal visit, mother's age, occupation, smoking, history of abortion and last pregnancy interval were the most important associated variables for LBW.
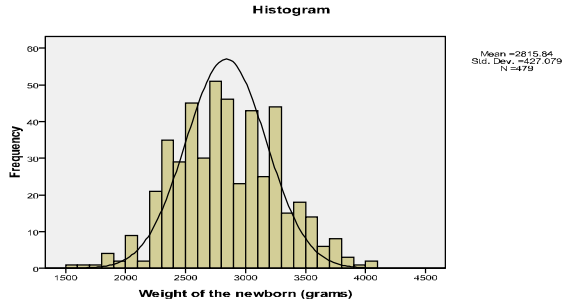
Table 1: relationship of BMI of mother with LBW

	Weight of the newborn (grams)				p-value
	Normal		LBW		
	N	%	N	%	
<18.00	0	.0%	25	100.0%	
18-24.99	370	83.0%	76	17.0%	<0.001
Total	370	78.6%	101	21.4%	

Table 2: relationship of sex of newborn with LBW

	Weight of the newborn (grams)				p-value
	Normal		LBW		
	N	%	N	%	
Male	194	82.2%	42	17.8%	
Female	180	74.1%	63	25.9%	0.032
Total	374	78.1%	105	21.9%	

Table 3: relationship of gravidity of mother with LBW

	Weight of the newborn (grams)				p-value
	Normal		LBW		
	N	%	N	%	
1	186	75.0%	62	25.0%	
2	151	86.8%	23	13.2%	
3	32	69.6%	14	30.4%	--
4	5	50.0%	5	50.0%	
5	0	.0%	1	100.0%	
Total	374	78.1%	105	21.9%	

Table 4: Relationship of Smoking with LBW.

	Weight of the newborn (grams)				p-value
	Normal		LBW		
	N	%	N	%	
Yes	31	58.5%	22	41.5%	
No	343	80.5%	83	19.5%	<0.001
Total	374	78.1%	105	21.9%	

Discussion

Birth weight, the weight of a neonate taken soon after birth, is the single most important indicator of neonatal outcome as well as overall health status later in life. In most of the third world countries including developing country like ours the incidence of low birth weight is high [4]. The problem of low birth weight needs to be addressed on priority basis as the children are the future the country. Low birth weight neonates need special care since they have increased risk of mortality and long term morbidity [5].

There were 236(49.3%) male and 243(50.7%) female in this study and male to female ratio was 0.99:1 and the rate of LBW was 21.9%. Birth weight of all term neonate ranged from minimum 1500 gm to maximum of 4000 gm with mean birth weight of 2815.84 gm with standard deviation 427.079 gm. In this study most of the women were between 20-29 years of age (71.4%) with 19.2% from age group of < 19 years and 13.4% of women above 30 years. In this study BMI of mother was significantly associated with the birth weight of newborn (p value (<0.001) where none of the mother BMI <18 had normal birth weight infants. Female sex was significantly associated with LBW (p value=0.032). The age of the mother was significantly associated birth weight of the neonate (p value<0.001).

Mothers with no education and primary level of education had more child with LBW as compared to babies born to mother with secondary or higher level of education and the relation was significant (p vale < 0.001). Most of the LBW were form the mothers who were housewife by occupation as compared to job holder mothers (private or government). Association between maternal income and its effect on birth weight was also studied and direct relationship was observed as most of the LBW were from the mothers with low income group as compared with high income group with p value < 0.001.

In family members of 2 the incidence of LBW was 19.6% while in family members

≥5 incidence of LBW was 37.8% which was very significant (p value < 0.001) and incidence of LBW was 17.6% in nuclear family and 35.3% in mothers from joint family which was also significant (p value <0.001). Whether maternal smoking during pregnancy affects the birth weight of neonate or not was also tried to study and the relationship was found statistically significant (p value < 0.001) that incidence of LBW was higher among smoker mother as compared to non smoker mothers (41.5% Vs 21.9% respectively). In this study there was significant relation between the history of previous abortion and the LBW of subsequent newborn (p value <0.001).

Those mothers received 4 or more antenatal care gave birth to higher birth weight in comparison to mothers who received 2 or less antenatal care visit (13.3% Vs 54.5% respectively) with p value <0.001. The incidence of low birth weight was higher in the mothers with interval<24 months as compared with mothers with interval >24 months (34% Vs 6% respectively). The relationship between the intake of iron and folic acid during pregnancy and its effect on birth
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weight was studied which showed the significant relationship with p value <0.001.

Conclusion

So from this study we conclude and recommend that better nutrition during pregnancy, better education of mothers, avoidance of smoking, taking regular ANC visit and commencement of ANC visit from the first trimester of pregnancy, increasing the birth spacing and taking iron and folic acid regularly will decrease the incidence of LBW and morbidity and mortality from LBW.

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