

Maternal Risk Factors of Low Birth Weight Neonates in a Military Hospital of Bangladesh

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DOI: <https://doi.org/10.3329/jafmc.v16i2.55300>

Abstract

Introduction: Low birth weight (LBW) is an index of our status of public health, maternal health and nutrition. LBW is a multi-factorial problem. The major challenge in the field of public health is to identify the factors influencing LBW and to institute remedial measures.

Objective: To find out the maternal risk factors of low birth weight neonates.

Materials and Methods: A descriptive cross sectional study was conducted at Combined Military Hospital (CMH), Ghatail from January 2018 to June 2019. A total of 707 mothers were included in this study who delivered live infants during study period; among them, 122 were LBW neonates. All the mothers of LBW neonates were evaluated and data were collected by using structured questionnaire.

Results: A total 707 live birth occurred during the study period of which 122 were LBW and the incidence of LBW was 17.3%. Out of 122 mothers 18(14.8%) were <20 years, 69 (56.6%) were between 20-30 years and 35(28.7%) were >30 years of age; 19(15.6%) were underweight, 83 (68.0%) were normal weight and 20(16.4%) were overweight and obese; 34(27.9%) took inadequate antenatal check up and 88(72.1%) mother took adequate antenatal check up. Among 122 mothers 25(20.5%) were para 01, 47(38.5%) were para 02 and 50(41%) were para ≥ 03; 16(13.1%) had birth space <2 years and 106(86.9%) had birth space >2 years; 09(7.4%) educated upto primary school, 73(59.8%) educated upto high school and 40(32.8%) educated upto college & above. Regarding maternal illness 30(24.6%) mothers had Premature rupture of membranes (PROM), 20(16.4%) had hypertension (HTN), 12(9.8%) had diabetes mellitus (DM), 05(4.1%) had severe oligohydramnios, 05(4.1%) had chronic anaemia and 06 had other illness (4.9%).

Conclusion: The risk factors for LBW babies identified in this study are modifiable. In order to reduce this menace, holistic approaches such as health education, maternal nutrition, and increasing the quality and quantity of the antenatal care services are of paramount importance.

Key- words: Low birth weight, Maternal risk factors, Combined Military Hospital.

Introduction

The world health organization has defined 'low birth weight (LBW)' as babies whose birth weight is <2500 grams, irrespective of duration of gestation¹, the measurement being taken preferably within first hour of life, before significant postnatal weight loss has occurred². LBW is due to prematurity, poor intrauterine growth (IUGR) or both. It is associated with increased neonatal morbidity and mortality³. The incidence of low birth weight is estimated to be 16 % worldwide, 19% in least developed and developing countries and 7% in developed countries⁴. LBW is considered the single most important predictor of infant mortality, compared with normal birth weight babies, LBW babies are 40 times more likely to die within the first 30 days of life^{5,6}. Globally about 20 millions LBW born each year, 95.5% of them in developing countries. LBW in any population reflect its socio-economic development and status of public health⁷. It is important to monitor birth weights as well as assess the magnitude of neonatal morbidity and mortality and its subsequent causes and predisposing factors in order to prevent it⁸. There are numerous factors contributing to LBW, both maternal and foetal. The maternal risk factors are biologically and socially interrelated. The mortality of low birth weight can be reduced easily, as most of the maternal risk factors can be modified if detected early and managed by simple techniques⁹.

Materials and Methods

This cross sectional study was conducted in Combined Military Hospital (CMH), Ghatail, Tangail from January 2018 to June 2019. A total 707 mothers who delivered live infants among them 122 were LBW neonates. All the mothers of LBW neonates were evaluated. The purpose of this study was to know the biosocial profile of LBW baby's mothers. A preformed proforma was used to collect data regarding age, parity, birth spacing, nutritional status, antenatal checkup, gestational age, education and medical illness. All the neonates' weight were measured by digital baby weighing scale. Gestational age was calculated from 1st day of last menstruation. Maternal weight/height were measured by adult digital weighing scale and stadiometer. Babies whose weight <2500g were included & babies weight >2500g, congenital heart disease, congenital anomalies, twin pregnancy were excluded from the study. All are from military family with average socioeconomic status. Data were

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entered into Microsoft Excel Programme and calculation was done in percentage.

Results

Table-I showed out of 707 neonates 305(43.1%) were delivered by normal vaginal delivery and 402(56.9%) were delivered by lower uterine caesarean section. Among 707 neonates 585(82.7%) were of normal birth weight and 122(17.3%) were of LBW.

Table-I: Distribution of neonates delivered during study periods (n=707)

Mode of delivery	Number	Percentage
NVD	305	43.1%
LUCS	402	56.9%
Weight of the baby		
>2500g	585	82.7%
<2500g	122	17.3%

Table-II showed out of 122 LBW neonates 08(6.6%) were <1500g, 25(20.5%) were between 1500g - 2000g and 89(73%) were >2000g. Among 122 LBW neonates 60(49.2%) were term, 62(50.8%) were preterm, 66(54.1%) were male and 56(45.9%) were female.

Table-II: Distribution of LBW neonates during study periods (n=122)

Weight of the baby	Number	Percentage
<1500g	08	6.6%
1500g-2000g	25	20.5%
>2000g	89	73%
Gestational age		
<37 weeks	62	50.8%
>37 weeks	60	49.2%
Sex		
Male	66	54.1%
Female	56	45.9%

Table-III showed that out of 122 mothers 18(14.8%) were <20 years, 69 (56.6%) were between 20-30 years and 35(28.7%) were >30 years of age. Among them 19(15.6%) mothers were underweight, 83 (68.0%) were normal weight and 20 (16.4%) were overweight and obese. 34(27.9%) mothers took inadequate antenatal check up and 88(72.1%) mothers took adequate antenatal check up. Out of 122 mothers 25(20.5%) were para 01, 47(38.5%) were para 02 and remaining 50(41%) were para ≥ 03. Among the mothers 16(13.1%) had birth space <2 years and 106(86.9%) had birth space >2 years. Regarding education 09(7.4%) educated upto primary school, 73(59.8%) educated upto high school and 40(32.8%) educated up to college & above. Regarding maternal illness 30(24.6%) mothers had PROM, 20(16.4%)

had HTN, 12(9.8%) had DM, 05(4.1%) had severe oligohydramnios, 05(4.1%) had chronic anaemia and others 06(4.9%).

Table-III: Distribution of the maternal risk factors for LBW Neonates (n=122)

Maternal age	Number	Percentage
< 20 years	18	14.8%
20-30 years	69	56.6%
>30 years	35	28.7%
Maternal BMI*		
<18.5(Underweight)	19	15.6%
18.5-24.9(Healthy weight)	83	68.0%
>25(Overweight/Obese)	20	16.4%
Antenatal visits		
<4 visits	34	27.9%
≥4 visits	88	72.1%
Para		
01	25	20.5%
02	47	38.5%
≥03	50	41%
Birth spacing		
<2years	16	13.1%
>2years	106	86.9%
Maternal education		
Primary school	09	7.4%
High school	73	59.8%
College and above	40	32.8%
Maternal illness		
PROM(Premature rupture of membrane)	30	24.6%
Hypertension (HTN)	20	16.4%
Diabetes Mellitus (DM)	12	9.8%
Severe oligohydramnios	05	4.1%
Anaemia	05	4.1%
Others(HTN+DM; hyperemesis gravidarum, Hypothyroidism,Valvular heart disease)	06	4.9%

*Pre-pregnancy

Discussion

This descriptive cross sectional study was performed to find out the maternal risk factors affecting low birth weight. In the present study the incidence of LBW were 17.3%. In developed countries, the incidence of low birth weight is less than 10% whereas in developing countries it is in the range of 15-40% of the total birth¹⁰. The proportion of low birth weight babies in a Kerala based study was found to be 18%¹¹. Their findings are in accordance with the result of our study. In this study out of the total low birth weight babies, 54.1% were male and 45.9% were female. This finding correlates with the study conducted by Kayastha et al¹² who found 52.0% male and 48.0% female LBW babies.

There was no relation between the sex of the child and low birth

weight in this study. But in the study done by Mondal et al¹³ who had found a relation between sex of the child and low birth weight. In this study, among the LBW babies mothers 14.8% were <20 years, 56.6% were between 20-30 years and 28.7% were >30 years of age. Low birth weight increases in teenage pregnancies then it progressively decreases till 30 years and again increases in >30 years age as explained in previous study^{14,15}.

Among the mothers 15.6% were underweight, 68.0% were normal weight and 16.4% were overweight & obese. This findings are similar to the study done by Dahlui M et al¹⁶ who had found more than half of the LBW, representing 61.7% babies born to mothers with normal BMI.

In this study, 72.1% mothers took adequate antenatal check up and 27.9% mothers took inadequate antenatal check up. This findings correlate with the study done by Bansal P et al¹⁷ had found out of 220 mothers, 192 (87.3%) had adequate i.e. >4 ANC visits and 28 (12.7%) had inadequate antenatal visits or no visits. In another study done by Joseph J et al¹⁸ had found there was no relation between number of Antenatal visits and incidence of low birth weight.

In the present study, 20.5% mothers were para 01, 38.5% were para 02 and remaining 41% were para ≥03. This findings are in accordance with the result of the study done by Dhar et al¹⁹ had found that multigravida mother's had more low birth weight babies than primigravida. In another study done by Sharma M et al²⁰ had found primigravida mothers were comparatively at lower risk (15.3%) of delivering LBW babies as compared to multigravida mothers (32.6%).

In this study 13.1% mothers had birth space <2 years and 86.9% had birth space >2 years. Birth to conception interval has insignificant association with birth weight. Similar studies done by Khatun S et al²¹ had found it may happen because it is not only the interval, some more, especially nutritional factor responsible for birth weight of baby. In this study, regarding education 7.4% mothers educated upto primary school, 59.8% educated upto high school and 32.8% educated upto college & above. A study done by Ghaemmaghani et al²² & another study done by Kader et al²³ had found mothers with lower educational attainment are generally at a higher risk of having a baby with LBW compared with mothers with more education.

Regarding maternal illness 24.6% mothers had PROM, 16.4% had HTN, 9.8% had DM, 4.1% had severe oligohydramnios, 4.1% had chronic anaemia and other illness 4.9% (HTN+DM; hyperemesis gravidarum, Hypothyroidism, Valvular heart disease). In a study done by Parikh T et al²⁴ had found that most common maternal risk factors associated with LBW babies were PROM(26.5%), anaemia (23.5%) followed by maternal nutrition deficiency, maternal pyrexia (6%), pregnancy induced hypertension (5%), ante partum haemorrhage (4%). In a study Das AC et al²⁵ found that out of 189 LBW newborns, 9 (5%) had history of maternal diabetes mellitus. In

another study Mahmood et al²⁶ found 7.6% infant of diabetic mother (IDM) were low birth weight. So, it is obvious that maternal diseases such as hypertension and diabetes are the most important risk factors for LBW^{27,28,29}.

Conclusion

Low birth weight is one of the most serious challenges in maternal and child health and is the single most important factor that determines the changes of child survival. LBW babies are more likely to have disabilities in the form of developmental delay and poor growth. The risk factors for LBW babies identified in this study are modifiable. In order to reduce this menace, holistic approaches such as health education, improving maternal nutrition, and increasing the quality and quantity of the antenatal care services are of paramount importance.

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