

Status of low birth weight at a tertiary level hospital in Bangladesh for a selected period of time

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Abstract

In Bangladesh, the prevalence of low birth weight (LBW) is unacceptably high. A cross sectional descriptive study was carried out during the period of June to September 2009 among the mothers whose babies were born in Bangladesh Medical College, a tertiary level hospital situated in Dhaka to assess the proportion of LBW babies. A total of 102 mothers were selected purposively whose babies were born within that period. A pre-tested structured questionnaire was used as research instrument and data were collected from them by face to face interviews. Results revealed that the proportion of LBW babies was 25.49% (n=26). The most of the LBW babies (30.77%) were identified whose average monthly family income was less than 5,000 taka. Among 26 LBW babies, 21 (80.77%) and only three (19.23%) were born before completing 37 weeks and after completing 37 weeks of the gestational period respectively. Significant association was found between LBW babies and family income ($p<0.001$), and between LBW babies and pre-term ($p<0.0001$). It is considered that the present findings of this study will not only help to take future interventions to combat the problem but also serve as a useful basis for future research and planning.

Keywords: Low birth weight, Monthly family income, Mother's age and education, Preterm, Gestation period.

Introduction

Low birth weight (LBW) is one of the major health problems of children both in developed and developing countries. It is one of the most serious challenges in maternal and child health. Its public health significance may be ascribed to numerous factors – high incidence, association with physical and mental retardation, high risk of perinatal and infant mortality and morbidity, human wastage and suffering, the very cost of special care and intensive care units and its association with socio economic under development.

LBW has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams (5.5 pounds) in first hour of delivery.¹ This practical cut-off for international comparison is based on epidemiological observations that infants weighing less than 2,500 gm are approximately 20 times more likely to die than heavier babies.² A birth weight below 2,500 gm contributes to a range of poor health outcomes which is more common in developing than developed countries. LBW is closely associated with foetal and neonatal mortality and morbidity, inhibited growth and cognitive development of children, and increased risks of chronic diseases later in life.³ Many of them suffer from protein-energy malnutrition and infection.^{3,4} Evidence now shows that adults born with LBW

Practice points

- LBW is closely associated with foetal and neonatal mortality and morbidity, inhibited growth and cognitive development as well as increased risks of chronic diseases later in life.
- This study identified that more than a quarter of the babies born at a tertiary level hospital in Bangladesh had LBW.
- A significant relationship was demonstrated between LBW and other factors e.g. the socio-economic condition of the families, age, education and physical status of the mothers, and the gestational age of the babies etc.
- The findings of the present study will help to implement preventive programs to improve maternal and child health.
- Large-scale studies are needed to identify valid and reliable evidence to outline relevant national policies and guidelines.

face an increased risk of chronic diseases including high blood pressure, non-insulin dependent diabetes mellitus, coronary heart disease and stroke in adulthood.⁵ LBW is the

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single most important factor determining the survival chances of the child. Many of them die during the first year of their life.^{4,5} Every year approximately 17 million infants in developing countries are born with LBW⁴ and those who survive have little chance of fully reaching their growth potential. The latest regional estimates of LBW range from 25% in South Asia, where more than one-half of the world's LBW infants are born, to 10% and 12% in Sub-Saharan Africa and Latin America, respectively.⁶ Although these rates are higher than the goal of 10% that was established by the world leaders at the 1990 World Summit for Children, the data for examining trends in developing countries are limited and the quality of data are questionable when available. More than two-thirds of births are not reported in many parts of Africa, Asia, and Latin America, as many deliveries occur in homes or small health clinics.^{6,7} This may result in an underestimation of the proportion of babies with LBW, because lower-income, higher-risk groups may be the least likely to be included in hospital or urban-based data sets.

Being born underweight is one of the major problems faced by infants in Bangladesh. Bangladesh is among the poorest countries of the world, with low socio-cultural, economic and health statistics. As there is no civil registry, it is impossible to obtain reliable information on health statistics.⁷ Also not many studies have been done on newborn babies in Bangladesh. According to WHO health statistics the prevalence of LBW (weight <2500 grams) in Bangladesh was about 40% in 2005.^{6,7}

LBW also indicates malnutrition and ill health of the mother. There is a significant and strong correlation between maternal nutrition and the length of pregnancy and birth weight. High incidence of LBW indicates the deficient health status of the mother, inadequate antenatal care and the need for improved care of the newborn babies.^{6,7} It has long been used as an important public health indicator.⁴ LBW is not a proxy for any one dimension of either maternal or perinatal health outcomes. Globally, the indicator is a good summary measure of multifaceted public health problems that include long-term maternal malnutrition, ill health, hard work and poor pregnancy health care. The smaller the baby, the more important it is to monitor his or her growth in the weeks after birth.^{5,6} This is particularly important for infants at high risk of poor feeding and inadequate growth. Countries should therefore be encouraged to ensure accurate and reliable weighing of infants as close to birth as possible.

LBW was regarded as one of the major targets of the Health for All (HFA) initiative and the Millennium Development Goals (MDGs). The goal of reducing the incidence of LBW by at least one third between 2000 and 2010 is one of the major goals of the Declaration, 'A World Fit for Children', and the Plan of Action adopted at the United Nations General Assembly Special Session on Children in 2002.^{8,9} Like other developing countries, quality and quantity of the relevant data for analyzing trends of LBW in Bangladesh is

lacking.¹⁰ The current study is aimed at identifying the proportion of LBW at a tertiary level hospital in Bangladesh for a selected period of time.

Methods and Materials

This was a cross-sectional type of descriptive study. The respondents were all mothers who delivered babies consisting of low and normal birth weight in Bangladesh Medical College Hospital (a tertiary level hospital in the capital city of Dhaka), over a period of three months between June to September 2009. Official permission for the study was obtained from the Director and Department of Gynecology and Obstetrics of the hospital. A purposive sampling technique was used to select 102 newborn babies and their mothers. A structured questionnaire was prepared in light of the objectives. It was then pre-tested and a final questionnaire was prepared to interview the admitted mothers in the Gynecology and Obstetric ward of the hospital. The purpose of the study was clearly explained to the respondents prior to taking informed consent from them. The data was collected throughout the study period by face to face interviews with the respondents and the questionnaire was filled in by the interviewers. The data were analyzed by using the Statistical Package for the Social Sciences, version 16.0 (SPSS, Inc, Chicago, IL). A bi-variable analysis with Chi-square test (χ^2) was done as test of significance.

Results

Among the respondents, the major age group was 20-25 years (46%) and about 52% of the respondents were educated at undergraduate level (Table 1). About two-fifths of the respondents (38%) had average monthly family income of Tk.10,000-15,000 and 13% had monthly family income of <Tk.5,000 (Table 2). The maximum percentage of LBW babies (30.77%) were born in families with an income of <Tk.5,000, while the minimum percentage of

Table 1: Socio-demographic characteristics of the

Characteristics	Respondents (%)
Age group	
20-25	47 (46%)
26-30	36 (35%)
31-35	15 (15%)
36-40	4 (4%)
Level of education	
SSC	2 (2%)
HSC	11 (11%)
Under graduate	52 (52%)
Graduate	31 (31%)
Post graduate	4 (4%)

Table 2: Distribution of monthly family income of the respondents

Income (Tk.)	LBW babies (1.5-2.49 kg)	Normal birth weight babies (2.5-3.99 kg)	Total no. of respondents (%)
	Respondents (%)	Respondents (%)	
<5,000	8 (31%)	5 (7%)	13 (13%)
5,000-10,000	7 (27%)	13 (17%)	20 (20%)
10,000-15,000	7 (27%)	32 (42%)	39 (38%)
>15,000	4 (15%)	26 (34%)	30 (29%)

LBW babies (16.67%) were born in the <Tk.15,000 family income group. A significant association was observed among family income and LBW ($\chi^2=21.37$, $p<0.001$). All the respondents received a balanced diet and extra nutrients. However, only 97% of the respondents received iron and folic acid supplements.

Out of 102 babies, 37 (36%) were born before completing 37 weeks of the gestation period, whereas 65 (64%) were born after completing 37 weeks (up to 42 weeks) of the gestation period (Table 3). An almost similar pattern was observed among 76 normal birth weight babies; 16 babies (21%) were born before completing 37 weeks of the gestation period and 60 (79%) were born after completing 37 weeks of the gestation period. On the contrary, among 26 LBW babies, 21 (81%) were born before completing 37 weeks of the gestation period while only 3 (19%) were born after completing 37 weeks of the gestation period. Association between LBW and gestational age ($\chi^2=29.89$) was statistically significant at $p<0.0001$ (not shown). Around one-fourth of the babies (26%) had LBW while around three-quarters (75%) had normal weight.

Discussion

LBW is considered to be an indicator not only of the health and nutritional status of the pregnant woman but also of the social development of the population of a country. The global prevalence of LBW is 15.5%, which means that about 20.6 million such infants are born each year, with 96.5% of them in developing countries. There is a significant variation in LBW incidence rates across the United Nations regions, with the highest incidence in South-Central Asia (27.1%) and the lowest in Europe (6.4%).^{9,10}

The results of this study showed that the proportion of LBW in a tertiary level hospital is 25.49%, which is low in

comparison to other studies.^{11,12} A previous study, conducted on 1,000 pregnant woman in Dhaka Medical College Hospital, reported the rate of LBW was 31.2%.¹¹ Another study in Sir Salimullah Medical college, Dhaka found that the incidence of LBW was 45.54% amongst admitted patients.¹² Compared to another study done in the Dhaka Shishu Hospital, the current study found that the incidence of LBW was 46.08% among the young mothers (20-25 years), which is supported by another study conducted at the same hospital which showed an incidence rate of 34.31% among mothers below 20 years of age.¹³

In the current study, significant association was found among family income ($p<0.001$) and LBW. In general, the rate of LBW was higher in low family income groups. Similar findings were observed in other studies in Bangladesh^{14,15} and other countries.^{11,12} This study also reveals that women with low body weight (less than 50 kg) were more likely to deliver small babies. Low maternal weight may also increase the risk of prematurity.¹⁶

In this study, respondents universally received a balanced diet and extra nutrients but iron and folic acid supplementation was not universal. Several studies^{11,14,16} identified an association between maternal nutrition and LBW babies but in this study no significant association was found. As most of the mothers were from better socioeconomic backgrounds, it can be assumed that data may not reflect the actual situation as there is no standard concept of having a balanced diet or extra nutrient supplementation among the respondents.

In several studies worldwide, mothers' smoking during pregnancy was identified as one of the most important risk factors for LBW.^{2,17-19} Only a few respondents were smokers so the prevalence of smoking (cigarettes) may be

Table 3: Distribution of new born babies according to gestation age and birth weight category

Gestational age (weeks)	LBW babies (1.5-2.49 kg)	Normal birth weight babies (2.5-3.99 kg)	Total no. of respondents (%)
	Respondents (%)	Respondents (%)	
<37 Weeks	21 (81%)	16 (21%)	37 (36%)
37-42 weeks	5 (19%)	60 (79%)	65 (64%)

underreported in the current study as Bengali women may be reluctant to reveal their smoking habits due to social, cultural, or religious reasons. The current study further identified a significant association between LBW and gestational age ($p < 0.0001$). Other studies²⁰⁻²² confirmed that LBW can result from prematurity.

Limitations

This cross-sectional study involved only a tertiary hospital based in Dhaka (the capital city) and had a small sample size; therefore, caution needs to be taken to generalize the data to other peripheral hospitals, especially hospitals in primary and secondary care settings.

Conclusion

This study was conducted to identify the proportion of LBW in a tertiary hospital in Bangladesh. This study identified that more than a quarter of the babies had LBW, and a significant relationship was demonstrated between LBW and other factors e.g. the socio-economic condition of the families, age, education and physical status of the mothers, and the gestational age of the babies. The findings of the present study will help as guidelines to initiate preventive programs to improve maternal and child health. Large-scale national studies involving other primary and secondary care hospitals should be conducted to identify valid and reliable evidence to outline relevant national policies and guidelines.

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