Review article

Low Birth Weight Prevalence, Determinants and Prevention in Bangladesh

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Introduction

Low birth weight (LBW) is a leading cause of childhood illness and a factor behind child's survival, not only in Bangladesh but in most developing countries. Those born with less than 2,500 grams is considered low birth weight babies. About 95.6% of LBW babies are born in low and middle-income countries. In South Asia, the rate of LBW births is almost double the global rate. As much as 70% of all babies born with LBW are from Asian countries, with 28% occurring in central and south Asia.[1] In order to reduce child mortality, significant reduction of LBW is essential which will help us achieve the Sustainable Development Goals (SDGs).[2]

Previous studies confirm that LBW contributes significantly to neonatal and infant mortality with 60%–80% of neonatal deaths worldwide occurring within 28 days of life (WHO). Infants with a significant LBW (<1500 g) are around 20 times more likely to die in infancy than those born within normal weight limits. LBW is also accelerating the risk of mortality in later childhood and adolescence due to congenital malformations and perinatal factors.[3]

It is thus important to note that the highest deaths of children occur in the early months of life and is caused by complications largely associated with conditions of pregnancy and safe delivery. Low birth weight, one of the most important factor in neo-natal mortality, is an outcome of several conditions in pregnancy including infections, maternal malnutrition, malaria, hepatitis and anaemia. Complications in delivery can endanger both the lives of the mother and the newborn. Low birth weight and prematurity are the two most important factors in neo-natal mortality. Several conditions in pregnancy like eclampsia and pre-eclampsia, infections, maternal malnutrition, malaria, hepatitis and anaemia contribute to maternal and neonatal mortality. Complications in delivery can endanger both the lives of the mother and the newborn.[4]

It is estimated that between 15% and 20% of all births worldwide are LBW (defined by the World Health Organization (WHO) as < 2500 g) or very low birth weight (< 1500 g), representing a minimum of 20 million infants around the world. The 2500 g cut point is drawn from epidemiologic studies showing that infants with birth weights less than 2500 g are approximately 20 times more likely to die in infancy.[5]

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Prevalence of Low Birth Weight

There has been National Low Birth Weight (NLBW) Surveys conducted in Bangladesh since 2003-2004. As per the first NLBW, it was estimated that about 36% of infants in the country were born with low birth weight, with 29% prevalence in urban areas and 37% in rural areas.[6] However there has been a notable fall in LBW prevalence in Bangladesh found in the NLBW 2012-2013. In the NLBW 2015, 22.6 percent of the babies were born with low birth weight.[7] The average prevalence of LBW in Bangladesh was 16.2%, as per Bangladesh Demographic and Health Survey (BDHS), 2017-18, which shows further reduction of low birth weight in Bangladesh. As per BDHS 2017-18, the average age of a mother whose baby with LBW was 24.8±5.9, with a height of 1.5±0.1 and a weight of 51.49±10.9.[8]

As per Multiple Indicator Cluster Survey (MICS) 2012 data, the lowest rates of LBW was observed in Rajshahi (11%) and highest rates in Rangpur (28%).[1] Education of mothers was found to be negatively associated with LBW. Also, family wealth status, along with the place of delivery, antenatal care coverage (ANC) and delivery assisted by quality health workers were found to be significantly associated with LBW.[9]

Using data from the Bangladesh Demographic and Health Survey, 2014, the rate of LBW was found to be around 19.9% (199 per 1000 live births) with the highest rate found in the Sylhet region (26.2%) while the lowest prevalence was found in the Rangpur region (13.5%). The rate was even higher in the rural areas (20.8%) and among illiterate mothers (26.6%).[10]

As per National Low Birth Weight (LBW) Survey,

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Bangladesh, 2015, "Low birth weight (LBW) is either the result of preterm birth (<37 weeks of gestation) or due to restricted fetal growth, i.e., due to intrauterine growth retardation.[8] Low birth weight is also associated with poor cognitive development, and chronic adulthood diseases-type 2 diabetes, hypertension and cardiovascular disease. It also leads to poor health through reducing immunity and increasing susceptibility to disease. Intra-uterine growth retarded (IUGR) and LBW infants are more susceptible to hypoglycemia and to birth asphyxia.[11] In a substantial number of studies they were seen to suffer from more diarrhea and pneumonia for a few months after birth, showing that LBW may also be a risk factor for post-neonatal death. Under-nutrition in mid-pregnancy may also impair development of the immune system. Weight at birth is a strong predictor for size in later life because most IUGR infants do not catch-up to normal size during childhood.[12]

Many studies have found a strong correlation between mothers who are underweight giving birth to an LBW baby. One significant issue is the high percentage of adolescent girls who have begun childbearing, by age 19 years which has remained consistently high (above 50 percent).[13,14] Adolescent pregnancy is associated with a 50 percent increased risk of stillbirths and neonatal deaths, and an increased risk of low birth weight (which is very high in Bangladesh at 22.6 percent),[7] premature birth, asphyxia, and maternal mortality.[15] In addition, the risk of stunting is 36% higher among first-born children of girls under 18 years in South Asia and it has been found that early motherhood remains a key driver of malnutrition.[16]

Determinants of Low Birth Weight

Many global and country-specific studies have found out the major determinants of LBW. These suggest that low birth weight is associated with gestational age. It has also been found from various research that preterm infants below 37 completed weeks have a higher mortality rate than full-term infants who are low weight for their gestational age.[17] Thus, preterm birth (short gestation), growth restriction or a combination of both are the main biological causes of LBW. From the behavioural aspect, there are studies which show significant causal relationships between maternal and paternal smoking and drug use, as well as nutritional and micro-nutritional, notably anaemia deficiency, and low birth weight.[18]

It has also been found from studies that maternal characteristics including age, maternal anthropometric measurements as well as the availability and uptake of ANC facilities are strong determinants of LBW.[19] Again, in many developing countries, mostly in the South Asian countries, early pregnancy because of high rates of early marriage is considered as a significant social factor in the birth of LBW babies.[20]

Gender is also a determinant of health seeking behavior. In order to improve health-seeking behaviors, gender responsive strategic behavioral communication interventions are being implemented. Also, the government is making efforts to end child marriage which has negative consequences like early pregnancy, birth complications and babies born with low birth weight which tends to perpetuate the intergenerational cycle of death and disability.[21] As per National Low Birth Weight (LBW) Survey Bangladesh, 2015, "LBW could be the main reason why more than 50 percent of the children in South Asia are underweight. Infants who weigh 2,000-2,499 gm at birth have a four-fold higher risk of neonatal death than those who weigh 2,500-2,999 gm, and a ten-fold higher risk than those weighing 3,000 - 3,499 gm." In Bangladesh, the rate of low birth weight was found to be 36 percent in the first ever low birth weight survey conducted in 2003-2004. The rate decreased to 22.6 percent in the low birth weight survey conducted in 2015.[7]

The percent of adolescent girls who have begun childbearing by 19 years has remained consistently high (above 50 percent) since 2000.[14] The increasing prevalence of adolescent underweight combined with persistent and high adolescent pregnancy rates is a disturbing trend. Adolescent pregnancy is associated with a 50 percent increased risk of stillbirths and neonatal deaths, and an increased risk of low birth weight (which is very high in Bangladesh at 22.6 percent),[7] premature birth, asphyxia, and maternal mortality.[15] In addition, the risk of stunting is 36 percent higher among first-born children of girls under 18 years in South Asia and as such, early motherhood is a key driver of malnutrition.[16] Adolescent birth rate in Bangladesh is one of the highest in the world which is 113 per 1,000 live births.[22] The prevalence of exclusive breastfeeding for the first six months of an infant's life is 55 percent.[23]

An analysis of MICS (2012-2013) data shows that the prevalence of low birth weight was lower amongst mothers who had completed a minimum of secondary education or undertook an ANC visit during pregnancy or had a doctor/nurse/midwife/auxiliary midwife assisted at birth. Also, it was found that the rates of LBW were higher (about 28%) among cases involving delivery at home compared to other facilities. Compared to normal delivery, children delivered by caesarean were found to have less of a problem of low birth weight. Again, the prevalence of low birth weight was higher among children from households with low wealth levels than among children from households with mid or high levels of wealth who are assumed to provide better nutrition to family members. In one study it was found that women from poor families were almost two times more likely to give birth to a baby with LBW.[24]

This finding is consistent with other LBW studies carried out in the developing countries in Asia and Sub-Saharan Africa. Pregnant women from poor families take inadequate amount of food, live in houses which lack clean water and proper sanitation facilities, cannot afford

good medical care and medicine, and travel to health centers for regular health check-ups.[25,26]

Low birth weight was proportionately more prevalent in second or subsequent births amongst young mothers, less than 20 years old. The opposite happened in case of older mothers (31+ years old) (Fig. 1). The prevalence of LBW among infants from rural and urban areas did not differ significantly. LBW varied greatly by geographical division, ranging from about 11% in Rajshahi to 28% in Rangpur districts.[1]

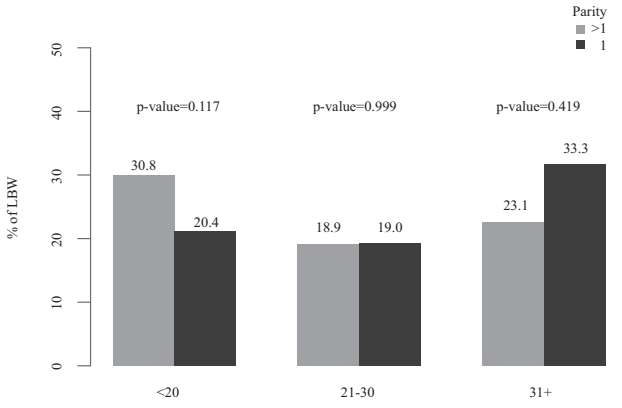

Fig - 1: Prevalence of LBW by mother's age and parity

Fig. 1 Prevalence of LBW by mother's age and parity

It was also found from MICS data that mothers who did not receive any ante natal care (ANC) services were 1.40 times more likely to give birth to low weight babies.

LBW Prevention and Recommendations

The critical importance of preventing LBW is vital for reducing the morbidity and mortality risks. A number of factors are contributing to the LBW in Bangladesh including gestational age, maternal age, pregnancy interval, low hemoglobin, non-pregnant weight, inadequate health services, socioeconomic status, educational achievement, violence during pregnancy, and tobacco use. Therefore, in Bangladesh, the factors which affect birth weight are biological, service related and behavioural in nature.[28]

Since low birth weight is an important public health concern and is an outcome of a combination of health, nutrition, social, educational and economic factors, we should have appropriate strategies and coordinated efforts to address the issue.[29] In order to bring down the rate of LBW and to achieve the SDGs, several areas are recommended for improvement. These are: stronger communication/ social mobilization campaign using appropriate messages with special focus on diarrhoea, malaria, immunization, clean water and improved sanitation, and feeding practices; comprehensive coverage with micro-nutrient supplements such as vitamins A, D, iodized salt, deworming tablets, and iron supplements for women; making available widely the oral rehydration salts (ORS); making impregnated bed nets universally available and used; empowerment of women and development of their socio-economic status; and making stronger efforts to ending child marriage: child marriage has negative consequences which are early pregnancy, birth complications and babies born with low birth weight.[30,31]

Since mother's underweight and the chances of the baby being low birth weight is co-related, in order to address this factor, the importance of proper maternal nutrition is vital. Also, taking four antenatal care (ANC) visits is also critical to mitigate the incidence of LBW since the findings of some studies show that there is higher chance of giving birth to an LBW baby by mothers who used less than four ANC visits.[32]

To reduce the prevalence of LBW further and to control the risk factors in Bangladesh, interventions should also focus on women's educational attainment, continuation of girl's higher secondary level education with the support of stipend programme, stronger social protection systems for improving health-care of mothers, ensure the consumption of adequately iodized salt, and strengthen facility-based perinatal care.[33] Community level interventions such as adequate nutrition for adolescent girls, improvement of linkage and referral for facility level births, planning appropriate birth spacing and antenatal care, postnatal care interventions to all women, early initiation and promotion of exclusive breastfeeding at community and facility level, balanced protein-energy supplementation, daily calcium supplementation for women, progesterone therapy for women at risk of preterm birth, intermittent iron and folic acid supplements for women of reproductive age and adolescent girls due to the high prevalence of anaemia are also recommended for reduction of LBW in the country.[34] Also, since there has not been any national LBW survey in the country since 2015, it is necessary to conduct the next LBW survey to measure the progress towards the reduction of LBW in Bangladesh.

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