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Research Paper

Low Birth Weight Babies: Prevalence and Associated Maternal Risk Factors At Tertiary Level Hospital

Medical Science

KEYWORDS : Low birth weight, Prevalence, Maternal risk factors

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ABSTRACT

Introduction: Low birth weight (LBW) is responsible for 60% of the infant mortality in the first year of life and it carries a 40-fold increase in the risk of neonatal mortality during the first month. Since birth weight has a strong correlation with infant survival, attentions have been given to strategies that will reduce the proportion of infants with LBW.

Objective: To identify the prevalence of low birth weight (LBW) babies in year 2013-14 and associated maternal risk factors in tertiary level hospital.

Material and Methods: In this prospective cross-sectional study, LBW babies were evaluated between April 2013 to March 2014 in tertiary level hospital. LBW was defined as babies weighing below 2500g and these babies constituted the study group. Maternal age, socio-economic status, educational status, height, any substance abuse, parity, frequency of antenatal visits, previous history of preterm delivery, multiple gestations, fetal presentation, medical conditions like anemia, hypertension, diabetes, thyroid disorders and placental anomalies were taken into consideration.

Results: Out of 4805 live born babies, prevalence of LBW was 28.2%. The prevalence of preterm and full term was 18.1% and 10.1% respectively. Of the LBW babies, 64.2% were preterm, 35.8% were full term. Prevalence rate of LBW babies is higher in mothers below 20 and above 35 years of age, mothers belonging to lower socio-economic class, poorly educated mothers and mothers with history of smoking, tobacco chewing or any other substance abuse. Prevalence rate of LBW babies is also higher in primiparous and grand multi-para patients, patients with inadequate antenatal visits (<3 visits), patients having past history of preterm delivery, multiple gestation, non-cephalic fetal presentation, placental anomalies and patients with medical conditions like anemia, hypertension, diabetes and thyroid disorders.

Conclusion: Extremes of maternal age (<20 and >35 years), lower socio-economic status, poor education, substance abuse, primiparity and grand multiparity, inadequate antenatal visits (<3), past history of preterm delivery, multiple gestation, non-cephalic presentation, medical conditions like anemia, hypertension, diabetes and thyroid disorders are important maternal risk factors related to LBW babies.

INTRODUCTION

Low birth weight (LBW) is responsible for 60% of the infant mortality in the first year of life and it carries a 40-fold increase in the risk of neonatal mortality during the first month. Since birth weight has a strong correlation with infant survival, attentions have been given to strategies that will reduce the proportion of infants with LBW. With recent advances in modern obstetric and neonatal care and technological development, high risk neonates have a greater chance of survival in the newly formed intensive care units. This also causes an increase in the rate of LBW infants, and subsequently an increased rate of long-term neurological sequelae.

The World Health Organization has estimated that annually 24 million LBW infants are born in developing countries. As the prevalence of LBW infants is around 5% in many industrialized countries, it changes between 5-30% in underdeveloped or developing countries. If we take into account that, millions of LBW infants are born annually in the World, we need to begin researching the health of neonates starting with birth weight. In this prospective study, we aimed to identify the LBW prevalence in 4805 live born babies in our hospital in year 2013-14 and the associated maternal risk factors of LBW babies.

MATERIAL AND METHODS

In this prospective cross-sectional study, 4805 live born babies were evaluated between April 2013 to March 2014 in tertiary level hospital. Aborted babies and stillbirths were excluded because of difficulties in accurately defining gestational age. The infants were weighed on an electronic metric scale in the delivery room immediately after birth. LBW was defined as babies weighing below 2500g and these babies constituted the study group. Babies born before 37 completed gestational weeks were defined as preterm. The neonates were examined and all anthropometric measurements were obtained at the same time. A baby was classified as SGA if the birth weight fell below the 10th percentile for gestational age. Maternal age, socio-economic status, educational status, height, any substance abuse, parity, frequency of antenatal visits, previous history of preterm delivery, multiple gestations, fetal presentation, medical conditions like anemia, hypertension, diabetes, thyroid disorders and placental anomalies were recorded on prepared forms.

OBSERVATIONS AND DISCUSSION

Table 1: Prevalence of LBW babies

Total No. of live born babies	No. of LBW babies	No. of NBW babies
4805	1355 **(28.2%)**	3450

Table 2: Prevalence of Preterm and Full term babies amongst LBW group

Total No. of LBW babies	Preterm babies	Full term babies
1355	870 **(64.2%) (18.1%)**	485 **(35.8%) (10.1%)**

Table 3: Prevalence according to different weight categories amongst LBW group

No. of LBW babies	2.0-2.5 kg babies	1.5-2.0 kg babies	<1.5 kg babies
1355	850 **(62.7%)**	360 **(26.6%)**	145 **(10.7%)**

Of the 4805 live born babies, 1355 were LBW babies. The overall prevalence of the LBW was 28.2% and 64.2% of the LBW babies were preterm, 35.8% were full term. The prevalence of preterm and full term LBW was 18.1% and 10.1% respectively. The birth weight of 10.7% of the LBW infants was less than 1500g, 26.6% weighed between 1500-2000g, 62.7% weighed between 2001-2500g. Previous studies have reported similar results, for example, the LBW rates in two different studies in India were 20% [1,2]. In many developed countries, LBW rates are around 5% [3]. The rate of LBW in our study was higher to rates reported in developed countries. This difference is most probably due to under nourished patients from lower socio-economic class form major group attending our institute. The perinatal mortality (29%) is very high in our country and a great number of LBW and very LBW infants are lost during parturition [4].

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Table 4: Demographic and Behavioural Maternal risk factors

	LBW babies
Maternal Age <20 years	245 **(18.1%)**
Maternal Age >35 years	140 **(10.3%)**
Lower Socio-economic status	977 **(72.1%)**
Lower Educational status	870 **(65.7%)**
Short stature <145 cms	123 **(9.1%)**
Smoking/ Tobacco chewing/ Substance abuse	221 **(16.3%)**

Extremes of maternal age is a significant risk factor associated with LBW. In our study, 18.1% LBW babies were born to mothers below 20 years of age and 10.3% LBW babies were born to mothers above 35 years of age. There is U-shaped relationship between maternal age and LBW, with the youngest (younger than 18) and the oldest (aged 40 and older) mothers being at high risk than 25-29 years old [5]. Low socio-economic status and uneducated mother are important determinants of LBW contributing 72.1% and 65.7% respectively in our study. One of the study in US compared associations between five indicators of socioeconomic status (maternal education, paternal education, maternal occupation, paternal occupation, family income) and three reproductive outcomes (low birth weight, small for gestational age, preterm delivery), maternal and paternal education levels were the best overall predictor [6]. In our study, maternal short stature (<145 cms) was responsible for 9.1% LBW babies, in favour of other study which states that maternal height alone accounted for 12.9% and 16.1% variation in neonate weight and length, respectively [7]. In our study, smoking, tobacco chewing and any other substance abuse accounted for 16.3% LBW babies. According to American Cancer Society, up to 5% of infant deaths could be prevented if pregnant women did not smoke [8].

Table 5: Obstetric and Medical Maternal risk factors

	LBW babies
Primiparity	618 **(45.6%)**
Grand Multiparity	170 **(12.5%)**
Infrequent Antenatal visits (<3)	304 **(22.4%)**
Past H/o Preterm delivery	168 **(12.4%)**
Moderate/ Severe Anemia (<9gm Hb)	554 **(40.9%)**
Pregnancy induced Hypertension	110 **(8.1%)**
Multiple Gestations	71 **(5.2%)**
Non-Cephalic presentation	95 **(7%)**
Placental Anomalies	38 **(2.8%)**
Diabetes	22 **(1.6%)**
Thyroid disorders	18 **(1.3%)**
Idiopathic	551 **(40.7%)**

In our study, primiparity as well as grand multiparity were associated with LBW babies. Mothers of 45.6% and 12.5% LBW babies were primiparous and grand multiparous respectively, while in another study carried out in canada, only primiparity was associated with a significantly increased unadjusted risk of LBW/SGA birth, whereas grand multiparity was not associated with increased risk of pregnancy outcomes [9]. Antenatal care plays a vital role in pregnancy outcome. 22.4% LBW babies were associated with inadequate antenatal care. Even though the average number of antenatal visits was satisfactory, early booking at a health centre need to be properly advocated to mothers to avoid poor birth outcome such as low birth weight [10]. Preterm births directly leading to LBW babies is recurrent risk factor. In our study 12.4% mothers of LBW babies had history of preterm delivery in previous pregnancy. The earlier the gestational age of the preterm birth, the higher the likelihood of recurrence. It is important to be aware that recurrent preterm births tend to occur at the same gestational age [11]. Although multiple gestations represented only 5.2% of the LBW babies, they account for a disproportionately large share of adverse pregnancy outcomes. With the development of obstetrical approaches, the incidence of multiple gestations began to increase. The risk of giving birth to a LBW infant increased significantly in multiple gestations in our study. When compared with cephalic presentation, non-cephalic births were associated with an increased rate of LBW. The prevalence of non-cephalic presentation in deliveries of LBW babies is 7%. With a LBW infant, the size of the head is even greater in relation to that of the buttocks and the chance of entrapment is markedly increased. This condition results in increased hypoxia and because it needs traction, it can cause trauma to the spinal cord and skeletal system. Goldenberg and Nelson found that, during labour, the premature fetus in breech presentation was 16 times more likely to die than the premature fetus in vertex presentation [12]. For these reasons, in LBW foetus in non-cephalic presentation, the most rational method of delivery is caesarean section [13]. High risk pregnancies associated with various medical conditions were important risk factors for LBW babies. Anemia, pregnancy induced hypertension, diabetes and thyroid disorders are major medical conditions associated with LBW accounting for 40.9%, 8.1%, 1.6% and 1.3% LBW babies in our study. 40.7% LBW were idiopathic in our study. There were limitations in this study. Because our study was performed in a maternity ward and labour room, if there were no symptoms or signs reflecting congenital infections, we did not check for congenital infections because of high cost. So we did not include the incidence of congenital infections in the etiology of LBW. We have also not included congenital malformations in etiology of LBW as most of were detected early in second trimester and terminated medically. In summary, improving the community health should start with improving baby health, and developing new strategies to decrease the incidence of LBW infants should be the one of our first goals. A history of a LBW infant should be an indication to seek recurrent cases of low birth weight and to ensure that close monitoring of fetal growth is implemented in subsequent pregnancies.

CONCLUSION

Extremes of maternal age (<20 and >35 years), lower socio-economic status, poor education, substance abuse, primiparity and grand multiparity, inadequate antenatal visits (<3), past history of preterm delivery, multiple gestation, non-cephalic presentation, medical conditions like anemia, hypertension, diabetes and thyroid disorders are important maternal risk factors related to LBW babies. Public health programs should focus on raising awareness on avoiding early marriage and pregnancy of females and raising educational levels amongst females. Moreover, it should provide emphasis on routine antenatal care and adequate rest and nutrition during pregnancy in order to decrease the prevalence of low birth weight. Provision of a more intensive ANC to mothers with a history of premature deliveries and medical conditions like anemia, hypertension, diabetes and thyroid disorders can be another important strategy to prevent low birth weight babies. The role of family members is important especially in fulfilling the nutritional and health care needs of the pregnant mothers along with supporting her to take adequate rest.

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