

Maternal Factors Associated With Low Birth Weight Babies

Shazia Aftab, Paras Golo, Alma Muhammad Iqbal

ABSTRACT

Objective: To determine the obstetric, antenatal, natal and socio-economic factors affecting low birth weight (LBW) babies.

Study design and setting: The cross-sectional study was conducted from February 2019 till May 2019 at Jinnah Medical College hospital Karachi.

Methodology: The targeted population was 100 mothers who recently delivered their babies and were present in the hospital during postpartum period. Variables included obstetric history, maternal risk factors, socioeconomic status and education of parents. Weight of the neonates was noted by the doctors within 24 hours of birth. Data was analysed on SPSS version 21.

Results: Variables having significant and positive influence on LBW were; age, activity and occupation of mother, age at first pregnancy, no. of pregnancies, maternal anemia. The 48% of low birth weight babies were present in mothers belonging to younger age group (18-20 years). The incidence of low birth weight increases with increased number of pregnancies, women with greater than 3 pregnancies had 18% of 1.6-2kg of weight of babies, 12% of 2.1-2.5kg of weight, 10% of 1.1-1.5kg of weight. Mother's with poor diet had 36% of 2.1-2.5kg of weight. Women with high activity during pregnancy having 53% of 1.6-2kg of weight babies. Regarding occupation 40% of housewife's risks of 1.6-2kg weight of baby with p-value of <0.05 as activity during pregnancy was high.

Conclusion: Factors like younger age women, multi-parity, increased physical activity maternal diet, anemia due to nutritional deficiency were contributed to low birth weight babies.

Keywords: Antenatal care (ANC), Anemia, Low birth weight babies (LBW), Maternal diet, Perinatal death.

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INTRODUCTION:

Low Birth Weight Babies (LBW) is a multifactorial outcome and remains a public health problem. It is an important predictor of newborn health and survival and is closely associated with fetal and perinatal mortality and morbidity.¹ LBW contributes 60% to 80% of all neonatal deaths.² The World Health Organization (WHO) defined low birth weight (LBW) as birth weight (BW) below 2500gms.³

More than 20 million infants worldwide, representing 15.5 percent of all births are born with low birth weight, 95.6 percent of them in developing countries², 9% in Latin America, and Brazil showed 8.0%³. According to data from 111

countries, Yemen has the highest percentage of LBW (32%) and 30% for India and Bangladesh. In contrast to neighboring countries like China and Iran; the prevalence of LBB accounted for (6%) and (7%) respectively.⁴

Pakistan is a developing countries with highest rates of LBW, ranging from 19% in urban areas to 32% in rural areas. It contribute high neonatal mortality which is estimated to be 58 per 1000 live births and high stunting rates in children aged < 5 years such as 44%.⁵

The birth weight is not only related with critical determinant of child survival, growth and development but also it is valuable indicator of maternal issues or risk factors and socio economic values such as residence (urban-rural difference), mother's age and occupation, birth order, the family's income and many maternal conditions such a nutritional status, mother's educational and health status.⁶ Studies suggest that short maternal stature, very young age, high parity, close birth spacing were all associated factors.⁷

Low birth weight children may face health complications throughout their lives like atherosclerosis, renal disease, non-insulin dependent diabetes mellitus, asthma, hypertension, obesity, psychological stress, hepatoblastoma, respiratory problems, ophthalmologic complications⁴, abnormal cognitive development, neurological impairment

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and poor school performance.⁸ Low birth weight is an indicator to calculate the possibility of a child surviving and many researches have been carried out on its causes and its effects. Actually, there is an exponential correlation between low weight, gestational age, and perinatal mortality.⁹

The prevalence of LBW in any population reflects its socio-economic development and it is a good alternative to measure the developmental status of the country⁷ and it can also be used as a good indicator of mother's nutritional status. The measure to reduce the incidence of low birth weight becomes most successful during the first year of life as it is most important factor affecting the infant mortality and morbidity. Weight of the newborn is a universal undeniable predictor of healthy infancy and childhood.

The risks of perinatal and infant mortality rates are greater among the low birth weight infants. In addition to increasing risk of mortality, low birth weight is also found to be associated with morbidity and long term developmental problems among those babies who survive.¹⁰ It is also recognized that the known factors for pre-term delivery and fetal growth retardation are associated with LBW such as low maternal food intake and illness, especially infections.⁷

It is public health significance that LBW causes mental retardation and high risk of perinatal, infant mortality and morbidity and it is evident that LBW is responsible for high perinatal and infant mortality.¹¹

LBW reflects inadequate nutrition and ill health of the mother. There is a strong and significant positive relationship between maternal factors and birth weight of the babies and it is generally assumed that prevention of LBW results in a reduction in perinatal mortality hence the rationale of the study was to identify the maternal factors associated with low birth weight.

Therefore aim of our study was to determine the obstetric, antenatal, natal and socio-economic factors affecting low birth weight (LBW) babies.

METHODOLOGY:

This was a cross sectional study for determination of LBW incidences and factors that lead to LBW of neonates at the time of delivery. The research work was conducted from February 2019 till May 2019 at tertiary care hospital of Jinnah Medical College hospital Karachi. The ethical approval was obtained from the relevant ethical review committee of Jinnah Medical College hospital Karachi (Ref# JMC. ERC.02.0802.19). The records were checked in the NICU of hospital and then questionnaire were being filled by doctor after taking verbal consent from mothers.

The exclusion criteria included babies of normal birth weight. Purposive sampling technique was adopted to reach the specified sample size that was calculated by WHO sample size calculator. A sample size of 100 mothers with their neonates was taken. The targeted populations were women

who recently delivered their babies and were present in hospital during postpartum period. Only mothers of live born single babies with birth weight less than 2500 grams LBW (low birth weight) irrespective of gestational age were recorded by the doctors within 24 hours of birth.

All the eligible cases were recruited into the study and data was recovered after interviewing the women, from the patient files, labor ward register and hospital maternal health medical records. The data included maternal and neonatal outcome which includes demographic details, labor and delivery details and immediate postpartum period complications of pregnancy.

The socio-demographic variables such as age, parity, age at first pregnancy, interval between pregnancies, maternal anemia, occupation of mother, diet, activity, antenatal visits, maternal education and occupation of husband and household income, type of delivery i.e. spontaneous vaginal delivery (SVD) and caesarean section and perinatal outcome measured were preterm delivery (<37 completed weeks), low birth weight (= 2.5kg at any gestational age) were assessed. Data were analyzed on SPSS version 21. The data was calculated by chi-square testing. P value < 0.05 was considered as statistically significant.

RESULTS:

Total 100 mothers were assessed and given birth to low weight babies. Assessing the age; 48% of low birth weight babies were present in mothers belonging to younger age group (18-20 years), 50% in >20 years group and only 2% in <40 years age group. Table 1: Depicted the antenatal factors affecting LBW of baby. The incidence of low birth weight increases with increased number of pregnancies, women with greater than 3 pregnancies had 18% of 1.6-2kg of weight of babies, 12% of 2.1-2.5kg of weight, 10% of 1.1-1.5kg of weight, 5% of 0.5-1kg of weight. Women with 2 pregnancies had 10% of 1.6-2kg of weight, 7% of 1.1-1.5kg of weight, 3% of 2.1-2.5kg of weight and women with 1 pregnancy causing 13% of 1.6-2kg. There was statistically significant association was found for diet During Pregnancy causing low weight babies at p value of <0.03. There were 45% mothers gave birth to 1.6-2kg of baby weight and 19% with 2.1-2.5kg weight of babies having average diet during pregnancy.

Women with high activity during pregnancy having 53% of 1.6-2kg of weight babies, 30% of 2.1-2.5kg of weight. Moderate activity during pregnancy causing 33% of 1.6-2kg of weight and 2.1-2.5kg of weight of babies at p-value of < 0.03. Maternal anemia was present in 17% in 1.6-2kg of LBW newborns and 11% in 2.1-2.5kg of LBW newborns p value of <0.05 shows significant association. Association of contraceptive causing low birth weight of babies was found at p value of <0.053. Not using of contraceptives is increasing the risk of low birth weight of baby. From socio-economic status of the enrolled participants; significant

variables were education and occupation of father and household income that contributes p-value of <0.046 and <0.03 respectively.

Table 1: Antenatal factors of pregnant mother affecting LBW of Neonates

Antenatal Factors	%	P value (0.05)*
Age at marriage		
18-20yrs	48	0.03
>20yrs	50	
<40yrs	2	
Parity		
Primipara	13	0.01
Multi-para	87	
Contraceptive use		
Yes	07	0.05
No	86	
Education of mother		
Can sign only	29	0.05
Middle	33	
Higher	38	
*Chi-square		

DISCUSSION:

In this study effort has been made to find out the prevalence and associated factors of low birth weight in the study area and the results helps to determine the causes of low birth weight babies. In our study factors associated with low birth weight of mothers included were maternal age, parity, monthly household income, maternal anemia, diet during pregnancy, maternal occupation, husband occupation, husband education and low socioeconomic status. The role of contraception and birth interval between pregnancies is found to be very important in the study.

In our research low birth weight babies found among mothers having younger age group (18-25 years) and this result is supported by other studies of Joseph Johnson et al¹⁰ and Nirmali Gogoi et al² reported that young mothers less than 20 years were related to low birth weight.

There is a significant association of parity & low birth weight found in our study; multigravida mothers had increased risk of low birth weight which is comparable with the study of Radha Kumari et al study¹¹ that multigravida mother's had more low birth weight babies while primigravida had 2% or less chances of giving birth to low birth weight. While Nayer et al¹² showed significant association of primiparity and low birth weight.

Pregnancy represents a state of increased metabolic requirement, the inadequate intake of key micronutrients may exacerbate the preexisting maternal deficiency, the diet

during pregnancy contributed to 90.7% cases of low birth weight babies in literature¹³ while it is 60% in our study. Anemia is a common nutritional deficiency disorder and is very common in pregnant women worldwide.¹⁴ Prevalence of anemia in pregnant women in developing countries is higher than in developed countries.¹³

In order to get the nutrients you need, you must eat from a variety of food groups, including fruits and vegetables, breads and grains, protein sources and dairy products. A previous study reported that maternal anemia was associated with fetal anemia and stillbirth and further affected embryo development, leading to LBW.¹⁵ Iron deficiency anemia in pregnancy is a risk factor for preterm delivery and subsequent low birth weight. Maternal anemia is not only responsible for maternal mortality but also associated with preterm birth and the incidence of LBW.¹⁶ In our study maternal anemia was associated with LBW and this result is in harmony with various other studies of Dhaka 2009¹⁷, Joseph and Khan A in 2016.^{2,9,11}

Maternal average monthly income was observed to influence the birth weight (BW) of a newborn as mothers who earn higher incomes had less LBW incidence. In current study household income showed to cause 26% cases of low birth weight babies which is evident from the study of Nepal¹⁸ which showed that 57% cases of low birth weight babies were due to low maternal income. Regarding to maternal occupation the present study demonstrated that pregnant mothers who engaged in jobs delivered more LBW babies (p<0.05) than others which is similar to other researches.^{19,20} Socioeconomic status in 90% cases causes low birth weight babies according to other studies^{13,16} but in our research it caused 26%. Comparing the others research with the current one few factors were found not causing low birth weight in babies such as maternal education, supplements during pregnancy and antenatal visits.^{13,16}

In the study few factors were found not causing low birth weight in babies such as maternal education, supplements during pregnancy, interval between pregnancies and antenatal visits while mother's education had shown a strong association with low birth weight babies in other studies and the incidence of low birth weight is observed more in mothers who were illiterate than in literate mothers which is also supported by study by Joseph et al.⁷

The incidence of LBW was high in mothers which were not using any type of contraception and was found to be statistically significant similarly in the study women with no birth control have high incidence of LBW which is also observed in other studies.^{2,11} There were few limitations encountered during carrying out research like language barrier as to speak to participants in their native language. This is recommended that during antenatal period mothers require proper follow-up visits and taking proper doses of iron supplements during pregnancy. Awareness programs

regarding consequences of teenage pregnancy should be conducted. In our study 86% women were not using contraception so the provision of safe motherhood services and expanding access and improving the quality of family planning services may help in reducing the perinatal deaths and LBW babies.

CONCLUSION:

It was concluded that few factors like younger age women, multi-parity, maternal diet and anemia due to nutritional deficiency were contributed to low birth weight babies.

Author Contribution:

Shazia Aftab: Statistical Analysis & References Writing, Drafting of the article, Results and Final Layout, Review of Manuscript.
Paras Golo: Data Collection, Tabulation of Results, Literature Review
Alma Muhammad Iqbal: Data Interpretation & Preparation, Literature Review

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