

Maternal Risk Factors Associated with Low Birth Weight Babies

Muhammad Ashraf*, Umar Hayat Khan**, Ahmad Ali***, Aziz Marjan Khattak****

ABSTRACT

Objective: The present study was conducted to know the maternal risk factors of LBW babies.

Place & Duration: This cross-sectional analytical study was carried out in the teaching hospital of Khyber Medical University Institute of Medical Sciences, Kohat, from 1st September, 2012 to 10th October, 2013.

Material and Methods: 100 apparently healthy mothers of full term pregnancy with normal vaginal singleton viable babies with low birth weight were included in the study and they were interviewed using structured questionnaire. All the mothers with preterm infants, twins, or those born via Cesarean section were not included in our study. Newborns weighing < 2500 gram were labelled as low birth. The mothers were analyzed for the risk factors of LBW including mother's age, height, Body Mass Index (BMI), level of antenatal care, level of education, socioeconomic status and the area of residence.

Results: Out of 100 mothers aged between 18 to 35 years, 64 belong to rural areas while 36 belong to urban locality. 27 percent were completely uneducated while 73 percent were educated to different levels. 55 out of 100 respondents were underweight (BMI < 18 kg/m²) with 23 Grand Multi Para. Majority of them 53% belong to poor families and 41 % had 3 or more ante-natal visits.

Conclusion: Low maternal level of education, low BMI, poverty and less antenatal visits are important risk factors for LBW.

Keywords: Low Birth Weight, Full term Pregnancy, Normal Delivery.

INTRODUCTION

Low birth weight is an important indicator of reproductive and general health status of population¹. Low birth weight (LBW) is considered the single most important predictor of infant mortality especially in first month of life. It is also significant determinant of infant and childhood morbidity, especially of neuro-

developmental impairment, such as mental retardation and learning disabilities². The burden of disease is high and has been universally recognized which is included in one of the Millennium Development Goal, to reduce infant mortality and improve maternal health status³. Both the uterus and fetus has long been supposed to be protected from environmental influences, and birth weight considered to be determined by genetic and ethnic factors⁴.

LBW is multi-factorial phenomenon. Several maternal and fetal factors are implicated in the etiology of LBW. Younger maternal age, maternal short stature, less antenatal visits and complicated pregnancies significantly associated with LBW⁵.

Maternal age is also significant regarding the incidence of low birth weight babies; maternal age below 18 years and above 35 years is a risk factor for LBW babies. At the lower extreme of age, there is uterine incompetence to the products of

- * Assistant Professor, Dept. of Pharmacology, Khyber Medical University Institute of Medical Sciences, Kohat.
 ** Associate Professor, Dept. of Community Medicine, Khyber Medical University Institute of Medical Sciences, Kohat.
 *** Lecturer, Dept. of Community Medicine, Khyber Medical University Institute of Medical Sciences, Kohat.
 **** Professor, Dept. of Pathology, Khyber Medical University Institute of Medical Sciences, Kohat.

Correspondence to:

Dr. Umar Hayat Khan

Associate Professor
 Deptt. of Community Medicine,
 KMU-IMS, KDA Hospital, Kohat.
 Cell: 0346-9296039
 Email: drhayatktk@yahoo.com

conception; and at the higher extreme, there is hormonal imbalance, which is inappropriate for different gestational events to occur⁶. Every year it is estimated that 20 million LBW babies are born globally, making up nearly 15.5% of all live births. Half of all low birth-weight babies are born in South-central Asia, where more than a quarter (27 per cent) of all infants weighs less than 2,500 gram at birth⁷. More than 95% of these low birth weight babies are born in developing countries, an estimated level (16.5%) is two-fold higher than the level observed in developed countries (7%)⁸. In South Asia, the incidence of Low Birth Weight is 36% of all live births. In India and Bangladesh, 30% of live babies born had LBW whereas in Pakistan the incidence was 19%⁹.

Neonatal death is 40 times more likely among LBW infants and 200 times greater among very-low-birth-weight infants (infants weighing <1,500 g at birth) than it is among infants of normal birth weight of 2500 g.

LBW is major predictor of morbidity both during childhood and adult life leading to growth failure, poor cognitive development and neurological impairment, higher probability of acquiring infections, malnutrition, and the development of chronic diseases like high blood pressure, cardiovascular disease, obstructive lung disease, diabetes, high cholesterol concentrations and renal damage later in life¹⁰.

Such babies contribute substantially to the overall burden on public expenditure and are also a permanent setback for their families. The present study was conducted to know the maternal risk factors of LBW babies.

MATERIAL AND METHODS

This was a hospital based cross-sectional study carried out in the teaching hospital of Khyber Medical University Institute of Medical Sciences, Kohat, involved 100 newborns with low birth weight. Study was carried out from 1st September, 2012 to 10th October, 2013. Mothers with their new born babies admitted in the above said hospital were included in our study. Among them, a sample of 100 was selected.

All babies with a birth weight of less than 2,500 grams were labeled as low birth weight (LBW) babies. All the mothers with full term

singleton babies, born through normal vaginal delivery were included in our study. Our study was restricted to the mothers who had not passed their puerperal period. All the mothers with preterm infants, twins, or those born via Cesarean section were not included.

Data was collected using a preformed closed questionnaire. The study variables were mother's level of education, BMI, age, level of antenatal care, socioeconomic status and the area of residence.

The education status of mothers was coded to distinguish between mothers who had received no school education (illiterate), had primary school education (5th grade), had completed secondary school (Matric) or had gone to college / university.

Maternal age was recorded as completed years of life. To determine the BMI, the mother's weight was measured first. Maternal weight was measured by portable adult weighing scale (analogue spring balance) in kilograms. The scale on this balance measured weight to the nearest kg. BMI was calculated by using the formula: $BMI = \text{weight (kg)} / \text{height (m)}^2$

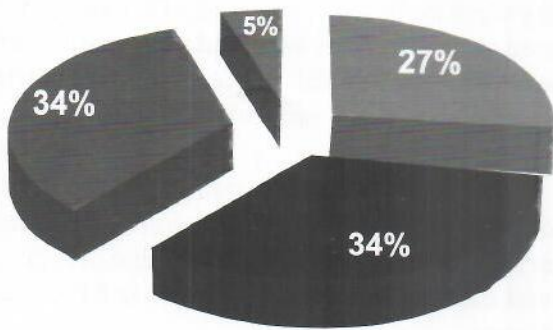
The socioeconomic status was established by asking about the monthly household income in Rupees. The area of residence was divided into two categories, urban and rural. Prenatal visits to a qualified health professional were established both by asking the mother and using past records. Data was coded, compiled in Statistical Package for Social Sciences.

RESULTS

Our study comprised of 100 female aged between 18 to 35 years. Out of them, 64 belong to rural areas while 36 belong to urban locality. Out of them 73 percent were educated at different levels while 27 percent were completely uneducated. The spectrum of respondent's education is shown in [Figure 1].

Our study showed that 55 out of 100 respondents were underweight ($BMI < 18 \text{ kg/m}^2$). Those having normal body weight (BMI in the range of 18-25 kg/m^2) were 41 in numbers and 4 were overweight ($BMI > 25 \text{ Kg/m}^2$). Grand Multi Para were 23 in number (those having more than 4 children) illustrated in [Figure 2].

Level of respondent's education



■ Illiterate ■ Primary ■ Secondary ■ Graduate

Figure 1: Literacy Level Of Respondents

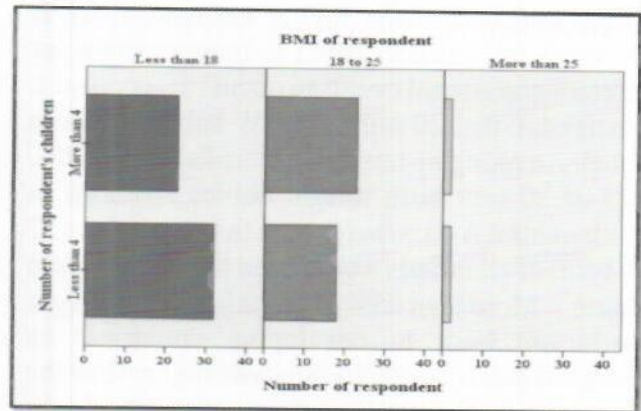


Figure 2: Body Mass Index & Status of Parity

Concerning the socioeconomic status of mothers, we find that majority of them 53 % belong to poor families and 29 % live below poverty line. 51 % had 4 to 8 family members dependent on monthly household income figures given in Table 1

Level of awareness of ante-natal visits was dependent on her husband employment status. 3 or more ante-natal visits were 31 % in employed husbands and in 36 % the ante-natal visits were less than 3, figures given in Table 2.

Table 1: Socioeconomic Status

Number of dependents on household income	Monthly household income / residence					
	< 10,000 Rupees (29 / 100)		10,000 to 30,000 Rupees (53 / 100)		□ 30,000 Rupees (18 / 100)	
	Urban	Rural	Urban	Rural	Urban	Rural
< 4 members	3	6	11	7	3	0
4 to 8 members	3	15	10	16	3	4
□ 8 members	0	2	2	7	1	7

Table 2: Ante-Natal Visits Of Mother in relation To The Employment Status Of Her Husband

Number Of Antenatal Visits	Husband Employment Status / Residence			
	Employed		Unemployed	
	Urban	Rural	Urban	Rural
< 3	16	20	3	20
≥ 3	15	16	2	8

DISCUSSION:

LBW babies have a higher risk of mortality, especially during neonatal period and infancy. Their organ systems are immature so they need stronger fight for their survival. Birth weight has long been the subject of clinical and epidemiological interest and a target for public health intervention¹¹. LBW has multiple risk factors. In fact, birth weight is determined by an interaction of socio-demographic and biological forces. To some extent it is a reflection of maternal health and an indicator of the health status of a given population. It is also the most common determinant of the chances of newborn survival and potential for future growth and development.

The findings of our study illustrate that maternal factors like education, BMI, socio-economic status and antenatal visits, all influence the incidence of LBW babies. Our study shows strong relationship between maternal health education and risk of LBW babies. In this study, we showed low maternal health education is significant risk factors for LBW babies. Low maternal health education is associated with delivery of LBW babies⁶. This is expected as low education leads to low health consciousness, lower nutritional status and low antenatal attendance, leading to the increased risk of LBW babies¹². The proportion of LBW deliveries significantly decreased as maternal education level increased and its results are in support of our findings. In this study we observed low maternal BMI is significant risk factor for LBW. Mothers having low BMI gave birth to higher proportions of LBW babies. The likely hood of these women to deliver LBW babies concurred with findings from a study done among pregnant women in east Java^{13,14}. This result also concurs with another already published study¹⁵. Other studies from developing countries have observed maternal underweight, as a potential risk factor for LBW¹⁶⁻¹⁹.

So, our study observation regarding Low BMI as risk factor for LBW babies are supported by the observations of other such type of studies. In our study we observed that low socio-economic status of mothers is a significant risk factor for delivery of LBW babies. This finding is consistent with many other studies²⁰⁻²³.

LBW was comparatively higher among babies born to mothers who were belonging to low socio-economic status. The risk of LBW babies decreased with improved socio-economic status of mothers as shown by increased household income of husband. Antenatal visits of the pregnant mothers are very important as they provide chances for monitoring the fetal well being and allow timely intervention for fetomaternal protection. Our study revealed relationship between antenatal visits and risk of LBW babies. Mothers with less than three antenatal visits during pregnancy were at higher risk to deliver LBW babies as compared to mothers with more than three antenatal visits. The results of other studies are supporting observations of our study⁵. One another study also reported this variable as a significant risk factor for LBW babies²³. Our study shows that risk of low birth weight babies is more in women living in rural areas as compared to women living in urban areas. It might be associated with better health care accessibility and more health friendly environment in urban areas. Mothers living in urban areas are also well educated and have a good income as compared to those living in rural areas^{24,26}.

CONCLUSION

It is concluded that low maternal education, low BMI, low socio-economic status, less antenatal visits and rural residence have strong association with LBW. To rectify this problem special attention is required to carry out further studies and to strengthen the mother and child health care services in the community.

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