

Determinants of Low Birth Weight Babies (A prospective study of associated factors and outcome)

I NAHEED* A YASIN**

*Department of Gynaecology, Services Hospital, Lahore

**Department of Gynaecology, Sir Ganga Ram Hospital, Lahore

Correspondence to Dr. Iffat Naheed

The weight of an infant below 2.5 kg. is classified as low birth weight (LBW). To establish the incidence of LBW babies, with particular reference to associated features and neonatal outcome a prospective study was conducted in the department of Obstetrics and Gynecology, Sir Ganga Ram Hospital over a period of one year from June 1, 1997 to May 31, 1998. Out of 3315 babies delivered, 135 (4.08%) were of low birth weight. 89 (65.92%) were delivered by mothers who never had the antenatal checkups done. Majority of the women i.e. 63(46.66%) were from poor socioeconomic class and most of the babies were delivered by young primigravidas 50(37%). Majority of the women was of average height and weight. 49(36.29%) babies were delivered by cesarean section and others were delivered by either spontaneous vaginal delivery or assisted with forceps or breech deliveries. Only 55(40.74%) babies had good Apgar score. Birth weight of 75 (55.55%) babies was between 2-2.4kg and of 21 (15.5%) was less than 1.5 kg. No cause was found in 12 (8.8%) cases, however, 91% of LBW had verifiable cause. No complication was noted in 76(56.24%) of the cases while 37% LBW babies developed complications like RDS, asphyxia neonatorum and sepsis. 104 babies were sent home. Out of these 75(72.11%) were alive and healthy after 6 weeks and 16(15.38%) died at home 13(12.5%) cases were lost to follow-up. It was concluded that high quality obstetrics and pediatric input is necessary at all stages of fetal development and the importance of education for the mothers in particular, and women in general was proved.

Keywords. Low birth rate, obstetrics/paediatric care, education of woman.

The weight of an infant at birth below 2.5kg is classified as low birth weight¹. The reported incidence of low birth weight is about 7% in England and Wales. In Sweden, which has a low perinatal mortality only 4% of babies, are born weighing less than 2.5 kg². Japan is the country where the proportion of LBW babies has fallen in the last 20 years; consequently a sharp decrease has occurred in perinatal mortality³. Incidence of LBW is 29% in some rural areas of India. Here the relative risk of LBW was found to be significantly higher among women of lower socioeconomic status, whose maternal age was less than 20 years, were primiparous, or whose last pregnancy interval was less than 6 months⁴.

Low birth weight neonate may be preterm or growth retarded. LBW babies are more common in African-Americans. Risk is more than twice as high among blacks as among whites in USA⁵. Younger mothers between 13 and 19 years of age ran 1.5 times as high a risk of having a preterm baby as women between the ages of 20-29 years and risk of IUD was 4 times higher⁶. The low birth weight rate was higher among first born than in other child⁷.

In urban areas of Canada, LBW rate was 1.5 times higher than in rural areas⁷. Low socioeconomic status of the mother within the family has a significant correlation with the incidence of LBW⁸. Poor periodontal health of the mother is a potential independent risk factor for LBW⁹. Constitutionally small mothers and women having weight less than 100 lbs or height less than 145 cm have lighter babies¹⁰. Pre pregnancy maternal weight is an important risk factor for LBW and IUGR¹¹. Women who developed 2 or more medical risks had about 3.5 times more the risk of

preterm delivery and 2.5 times the risk of LBW as compared to those without such risk¹². In multiple pregnancy 20-25% twins are small for gestational age¹³. The preventable determinants of preterm delivery have been identified as age of gravida under 20 years, weight less than 120 lbs, smoking and infrequent visits¹⁴.

Low birth weight infant born preterm can develop hypoglycemia, hypocalcaemia hyponatremia, anemia and infection¹⁵. RDS is the most common prevalent cause of death in very low birth weight infants, followed by infection¹⁶. Coagulase negative staphylococcal bacteremia is an important complication among VLBW infants¹⁷. Low birthweight infants tend to have accelerated growth for the first 6 months after birth particularly if intrauterine deprivation was a major factor¹⁸. Long-term complications include low IQ, learning and behavioral disorders major neurological disorders, cerebral palsies and severe mental retardation. Adult health may also be significantly impaired owing to hypertension, cardiovascular disease and carbohydrate intolerance¹⁹. Management depends upon prevention, detection and assessment at the time of delivery.

Aims and Objectives

To determine the incidence of LBW babies in the study population, with particular reference to cause and mode of prevention thereof, in order to improve existing practices.

Materials and Methods.

This study was carried out in unit -1 of department of obstetrics and gynecology, Sir Ganga Ram Hospital over a

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period of one year from June 01, 1997 to May 31, 1998. All those mothers who gave birth to babies weighing less than 2.5 kg were included in the study population. Patients who had three antenatal checkups were considered as booked and others were considered as unbooked cases. On admission, detailed history was taken and thorough examination was carried out to look for the reasons thereof. Relevant investigations were carried out. The timing and mode of delivery was decided after considering the condition of the mother and the baby. The babies were handed over to the paediatrician and were subsequently followed up in the nursery.

Results

During the one-year period total number of deliveries were 3315. 135(43.08%) babies were of low birth weight. 46(34.07%) were booked patients and 89 (65.92%) were un-booked. 32(23.70%) belonged to upper middle class. 40(29.62%) belonged to lower middle and 63 (46.66%) belonged to lower class. 50(37%) were primiparas, 38(28.14%) were para 1-2, 42(31.11%) were para 3-5 and 5(3.70%) were para 6-10.

Presenting features were labor pains in 55 (40.74%) cases, leaking per vaginum in 36(26.66%), vaginal bleeding in 19(14.04%), multiple pregnancy in 7(5.18%), loss of fetal movements in 6(4.44%), sluggish movements in 2(1.48%), and imminent eclampsia in 4(2.96%) and eclampsia in 5(3.70%) patients.

107 patients (79.26%) were more than 5 feet tall and 28 (20.74%) were less than 5 feet. The weight of 108 patients (80%) was more than 50 kg and 27 patients (20%) had weight less than 50 kg.

63(46.66%) patients delivered vaginally, 12(8.8%) were induced, outlet forceps were applied in 8(5.92%) patients, assisted breech delivery was carried out in 2(1.48%) decapitation was done in one (0.74%) and caesarean section was carried out in 49 (36.29%) patients.

Table 1 Apgar score and birth weight of babies.

Apgar Score	No. of LBW babies.	%age
8-10	55	40.74
6-7	36	26.66
Less than 5	28	20.74
Zero	16	11.85
Weight of babies in Kg.		
2-2.4	75	5.55
1.5-1.9	39	28.88
Less than 1.5	21	15.55

Apgar score and weight of the babies is given in Table 1. 28 babies with Apgar score less than 5 developed complications like respiratory distress syndrome, asphyxia neonatorum and sepsis. 15 babies died in nursery. 5 babies were discharged in healthy condition and 8 were discharged on request. Out of 16 stillborn babies, 4 were cases with intrauterine death, 8 had congenital

abnormalities not compatible with life and 4 were extremely low birth weight. Determinants of low birth weight babies are given in Table-II.

Table-II Determinants of low birth weight

Determinants	No. of babies	%age.
Preterm labor	47	34.81
PROM	21	15.55
IUGR	33	24.44
Undetermined	12	8.8
Constitutional	10	7.4
Congenital anomaly	08	5.92
IUD	04	2.96

Regarding the neonatal outcome, 76(56.2%) babies had no complication, 2(1.6%) developed sepsis, 9(6.66%) developed asphyxia neonatorum, 15(11.11%) were premature, 2(1.46%) developed anemia, 27(20%) had RDS and 4(2.9%) were intrauterine deaths.

Out of 104 babies sent home, after 6 weeks 75(72.11%) were alive, 16(15.38%) died at home after variable time and 13(12.5%) were lost to follow-up.

Discussion

In the study, out of 3315 babies delivered, 135(4.08%) were of low birth weight. This compares favourably with the results obtained in Sweden (4%), England and Wales (7%) and 29% for India (2&9).

In this study, mothers who never had the benefit of antenatal checkup delivered 65.92% babies. Women predisposed, registered 1.5 to 2-fold increase in preterm delivery of LBW babies¹². This shows the importance of early booking and regular antenatal checkups for detection of problems and their management.

Most of the LBW babies were delivered by young primigravidas (37%). Multiparas delivered only 3.7% of LBW babies. In Canada, the ratio of primiparas to multiparas was 6.7% and 4.9% respectively⁷. This may not, however, be a valid comparison as birth rates in Pakistan and Canada differ substantially.

In this study, it was noted that majority of the women (46.6%) were from poor socioeconomic class. Ng E et al noted that LBW rate was 1.4 times higher among women of lower income group as compared to those from the highest income group in Canada (16). Arif et al in Pakistan also noted the correlation between poverty and LBW⁸.

Previous intrauterine death, LBW and midtrimester abortion were found to be important features of past obstetrics history. Similar results have been found by Sharma et al 1994, USA¹². Women with previous fetal loss had two-fold increase in the risk of preterm delivery and LBW.

In this study it was noted that majority of women were of average height and weight. Albeit, 20% of the LBW babies were delivered by mothers whose height was less than 5 feet and weight less than 50 kg. Thin women

tend to give LBW babies¹⁰.

In this study 36.29% of LBW babies were delivered by caesarean section, either electively or emergently. This indicates a high ratio of deliveries by caesarean section for LBW babies as compared with babies of normal weight. The normal rate of caesarean section is 33% and 10% in USA and Europe, respectively²⁰. The common indications for caesarean section were fetal distress, severe fetal growth retardation, uncontrolled blood pressure and preterm baby with previous caesarean section.

Babies with normal birth weight invariably have good Apgar score, unless there is fetal or maternal disease. Interestingly, in this study only 40.70% of infants had good A/S. Birth weight of 55.5% infants was between 2 and 2.4 kg. 28.8% babies weighed between 1.5 and 1.9 kg and 15.5% were less than 1.5 kg.

No cause for LBW was found in 8.88% of cases, however, 91% of LBW had verifiable cause. 54.4% of the babies were delivered before term, either due to preterm labor or premature rupture of membranes. 24.44% of the babies were growth-retarded. Other cause of LBW babies were either constitutional or intrauterine death or congenital abnormalities.

LBW is one of the three major causes of perinatal mortality. Other causes are congenital abnormality and hypoxia. In this study it was noted that 56.24% of the babies did not develop any complication, while 37% of the LBW babies developed complication like RDS, ANN and sepsis. 2.96% of the babies were delivered dead. 20% of the babies died in nursery due to RDS. Coagulase negative bacteria has been determined as a significant complication among VLBW infants¹⁷.

After 6 weeks, 72.11% babies were alive and healthy. 15.16% infants died either due to prematurity or infection. 12.5% of the babies were not brought for follow-up. Efforts should be made to increase the accessibility of high quality prenatal care for the high risk group with previous LBW babies and to implement smoking intervention³.

Conclusion

While yielding some interesting findings in regard to nexus between poverty and LBW, the study clearly demonstrated the importance of high quality obstetrics and pediatric input at all stages of fetal development. It further highlighted the importance of well-equipped hospitals, duly staffed by trained professionals to minimise risks to LBW infants. Most importantly, however, it furnished incontrovertible proof of the importance of education of mothers in particular and women, in general.

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