

## Maternal risk factors and outcome of low birth weight babies admitted to a Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India- A cross-sectional study

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### Abstract

**Aim:** Present study was conducted to know the maternal risk factors and outcome of low birth weight babies in Department of Pediatrics, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India.

**Materials and Method:** Two hundred cases of low birth weight babies irrespective of gestational age, without any congenital anomalies were included, after informed consent. Detailed histories regarding maternal risk factors were taken and clinical examination done in all cases. Mothers' height and weight were recorded. The babies were followed up during this hospital stay to determine the morbidity and mortality.

**Results:** Low maternal weight, multiparity, low socio economic status, illiteracy, inadequate antenatal care, maternal anemia, maternal malnutrition, maternal hypertension and PROM were the maternal risk factors associated with low birth weight babies. The most common cause of morbidity and mortality in low birth weight babies were sepsis, MODS, HIE, RDS, NEC, hypoglycemia, PDA, IVH, meningitis and feeding difficulties.

**Conclusion:** Identification of high risk factors and appropriate management can reduce neonatal morbidity and mortality.

**Keywords:** Height, Hypoglycemia, Low birth weight, Risk factors

### Introduction

The weight of the infant at birth is a powerful predictor of infant growth and survival and is dependent on maternal health and nutrition during pregnancy.<sup>(1)</sup> Infants with birth weight less than 2500g are considered to fall in LBW category carrying relatively greater risks of perinatal and neonatal mortality.<sup>(2)</sup> LBW is a consequence of prematurity, SGA or both.<sup>(3)</sup> SGA is defined as birth weight below the 10th percentile of a standard optimal reference population for a given gestational age and sex.<sup>(4)</sup> Attempts have been made to classify IUGR as proportionate or disproportionate on the basis of ponderal index. There is significant variation in the incidence of LBW across regions. South Asia has the highest incidence with 21-28% of LBW.<sup>(5)</sup> In India inequality has ranged from a prevalence of 10% among high socioeconomic status to 56% in deprived slum areas. Prevalence of LBW in Orissa is 40%, being the highest in India.<sup>(6)</sup> Socio-demographic and life style factors, such as maternal education, poverty, stress, smoking and alcohol can influence neonatal outcome.<sup>(7)</sup> The present study was conducted to identify maternal risk factors contributing to outcome among LBW babies.

### Materials and Method

This cross-sectional observational study was carried out in the Department of Pediatrics, Gujarat Adani institute of medical science, Bhuj. Ethical clearance was taken from the institutional ethics board. The study consisted of 200 cases of LBW babies admitted during the period from 2014 to 2016.

Selections of cases were according to inclusion criteria. All neonates weighing less than 2500 grams, irrespective of gestational age were included. Babies with major congenital anomalies were excluded. A proforma was made with respect to history taking, physical examination, various appropriate investigations needed for diagnosis and management of cases. Extended Ballard Scoring was used for assessing gestational age. Clinical features and Collarado intrauterine growth charts was used to identify IUGR babies. Ponderal index was used for classification of IUGR babies. All the newborn babies admitted to the pediatric ward of Department of Pediatrics, Gujarat Adani institute of medical science, Bhuj weighing 2500grams were studied. Complete history was taken from the mother regarding age, socio economic status, antenatal care including dietary history, folic acid and iron supplementation, immunization history, complications during pregnancy, mode of delivery. Weight and height of the mother were also recorded. A thorough physical examination of infant was carried out with particular orientation of gestational age, using extended Ballard Scoring. Systemic examination was done to detect any congenital anomalies, infection and diseases. Routine investigations like hemogram, sepsis screening, serum bilirubin, blood sugar was done. CSF analysis, serum calcium, blood grouping, Chest x-ray, cranial ultrasound was done in relevant cases.

The babies were followed up during this hospital stay to determine the morbidity and mortality. Adequate antenatal care was considered, when the pregnant women registered at anytime during pregnancy had at

least three antenatal checkups. Weight gain was calculated by subtracting weight of the mother 12 weeks or before from weight of the mother at term. Maternal exposure to tobacco meant use of any tobacco product such as tobacco chewing, cigarette or bidi smoking or any form of smoking.

**Statistical analysis:** Data The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 15 (SPSS Inc. Chicago, IL, USA) Windows software program. Descriptive statistics included computation of percentages. For all tests, confidence level and level of significance were set at 95% and 5% respectively.

## Results

The total number delivery in Department of Pediatrics, Gujarat Adani institute of medical science, Bhuj is 3912 during the study period. Among them 1080 babies were admitted to NICU with 612 being LBW. There were 72 cases of IUGR and 128 preterm LBW babies in the study. The percentage of LBW was 56.7% male predominance. Out of which 64% were preterm and 36% IUGR babies. Most of the LBW babies were in the range of 28-32 weeks with the mean birth weight of 1230 grams. The percentage of LBW babies was 64.9% in women less than 45 kg as against only 34.9% in women more than 46kg weight.

The LBW babies in present study was reported to be highest in mothers with third parity, minimum birth weight recorded in para 4 & 5. The lowest mean birth weight was noted in mother less than 20 years. Maximum numbers of LBW babies were among mothers receiving no antenatal care and 90% of them were from rural areas. More LBW babies belong to mother of low socioeconomic class and 64% of them were laborers. Out of 200 LBW babies studied, 88.4% mothers had pregnancy related complications. Table 1 shows that most common maternal risk factors associated with LBW babies were PROM, (26.5%), anaemia (23.5%) followed by maternal nutrition, maternal pyrexia(6%), PIH(5%), APH(4%). Out of 200 LBW babies 54% were delivered at home and rest (46%) were delivered in hospital.

Among LBW babies 89% of babies were products of spontaneous vaginal delivery. Common complications in LBW babies were sepsis (22.5%), MODS (43%), HIE(12%), RDS(5%), NEC (3%), hypoglycemia (2.5%), PDA (1%), IVH (1%), meningitis (3%), hyperbilirubinemia (4.5%), and feeding difficulties (2.5%). Out of 200 LBW babies 59 (29.5%) expired. Out of 59 deaths, 20 were in Term IUGR and 39 in preterm babies. The most common cause of mortality being sepsis 36%, HIE (21%), RDS (6%), IVH (3%). Mortality among LBW babies was more common among male babies (20.5%) as opposed to (9%) among female babies.

## Discussion

This study describes the influence of maternal risk factors on birth weight of infants. It presents that LBW was the result of maternal risk factors such as maternal malnutrition, anemia, PROM, PIH, APH, maternal infections, low pre-pregnancy weight, multiparity, inadequate antenatal care, low socioeconomic status. Similar results were noticed by Mccowen et al who found that independent risk factors for LBW babies were low maternal weight, increased maternal age, daily vigorous activity, cigarette smoking.<sup>(8)</sup> In a study by Deshmukh et al, it was documented that LBW was associated with anemia, low socio-economic status, short birth interval, maternal height, maternal age, low BMI, primiparity.<sup>(9,10)</sup> Similar results were also noticed by Siddhi et al, who showed that maternal risk factors for LBW were low socio-economic status, non pregnant weight less than 40kg, hemoglobin less than 9grams/dl, third trimester bleeding.<sup>(11-14)</sup> This study showed that complication related to LBW babies were sepsis, MODS, HIE, RDS, NEC, jaundice, hypoglycemia, meningitis and feeding difficulty. David osrin found that preterm infants are more likely to experience illness as a result of thermal instability, hypoglycemia, respiratory distress, jaundice, apnea and feeding difficulties.<sup>(15,16)</sup> This study observed that the causes of mortality in LBW babies were sepsis, HIE, RDS, IVH. Similar observation was seen by Jeeva Sankar et al.<sup>(17-21)</sup>

This study showed that LBW is a result of multiple risk maternal factors like multiparity, low socio-economic factors, inadequate antenatal care, maternal malnutrition, low maternal weight, anemia, 3 rd trimester bleeding.

## Conclusion

Since the proportion of infants with LBW is a key indicator of general population health, and Orissa having the highest LBW rate in India, it is said that if some of the maternal risk factors are taken care, then LBW rate can be reduced to a significant extent. Prevention of early marriage and early child birth and sticking to a small family norm and utmost emphasis on good antenatal care, improving literacy, socioeconomic status, avoidance of smoking, alcohol, tobacco chewing, heavy work during pregnancy will go a long way in preventing fetal malnutrition.

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