

## Maternal and Neonatal Profile & Immediate Outcome of Term & Preterm Low Birth Weight Infant in Neonatal Period Admitted to a Tertiary Care Centre” in Eastern India.

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### Abstract:

**Objective:** to evaluate the maternal profile and neonatal profile and immediate neonatal morbidity and mortality till discharge.

**Methods:** the study was a hospital based prospective study conducted in the dept. of paediatrics, Chittaranjan seva sadan college of obstetrics, gynaecology and child health, during the period of 2012-2014. 1871 cases of LBW babies were included out of the 3335 admission in the said department during the period from 2013 to 2014.

**Result:** it was observed that the risk of LBW babies was more in the primigravida mothers and there was a higher incidence of LBW babies in younger age group mothers. The mean maternal age was 23.97 yrs, the maternal height was 143.96 cm and the mean maternal weight was 44.52 kg. Maternal height less than 145 cm was found to be a significant risk factor (72%) among the LBW babies. The study revealed that maternal anemia, exposure to smoke, preeclampsia, APH, PROM, bad obstetrics history were risk factors for the LBW babies.

There were few cases of hypertension, diabetes and heart diseases in our study group. The complication of the LBW babies in the neonatal period was studied. Hypoglycemia was observed in 3.74% of LBW babies and that 4.38 % of cases suffered from hypothermia. 52% babies were suffering from hyperbilirubinemia and hypoxic ischemic encephalopathy was observed in 35% of cases. Respiratory distress occurred in 14.27% of cases and PDA was observed in 2.08% of cases. In our study ICH was developed in 1.65% of cases and 45.96% babies developed septicemia. It was found that about 79.05% of term babies and 73.2% babies preterm babies were successfully managed and discharged from the hospital. 7.75% of preterm and 5.82% of term babies needed intensive care treatment. 7.34% of preterm LBW babies and 10.69% term babies discontinued treatment and left hospital against medical advice. Death rate among preterm (19.44%) is more than term (10.25%) LBW babies. the mortality rate among ELBW infant was 33.69% and 27.8% among 1000-1499 gm LBW group babies. Mortality rate is low (9.37%) in higher birth weight (2000-2499 gm) group.

**Conclusion:** in our study maternal and ante natal profile showed a number of high risk factors. The identification of common high risk factor is important for appropriate pre natal care and to reduce the mortality and morbidity of the LBW infant.

**Keywords:** Antenatal Profile, Preterm Labour, Lbw, Vlbw.

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### I. Introduction

low birth weight (LBW) refers to all babies, whose weight at birth is less than 2500gm irrespective of gestational age (WHO 1961). The incidence of lbw babies is an indicator of many variable health related indices like genetic, nutritional, and maternal access to available health care system in the society. The follow up and outcome of such babies are important.

Increased perinatal & infant mortality are major health problem in a developing country. Perinatal mortality is known to be particularly high in infant with low birth weight. Birth weight is a critical determinant for neonatal morbidity & also for the growth & development of the infant in the early neonatal period. Because of its developmental uniqueness, birth weight depends on both maternal and foetal genetic constitution as well as other variable such as socioeconomic status, nutritional supplements, bad obstetric history (BOH), maternal weight and height and maternal illness are known to influence the weight of the baby. For a particular patient, single or several maternal and environmental factors may act individually or jointly in the pathogenesis of the low birth weight babies.

Different workers throughout the world have been working in this field and have determined the risk factors present in their local areas. Due to wide variation, factors operating in one region may not be applicable to other parts of the world or nation. Consequently study of birth weight has remained as an important field of research for effective maternal and child health care programmes. Identification of maternal factors which can

be assessed by history and simple clinical examination can help the peripheral health workers to refer high risk cases to higher centres.

## II. Material And Methods

This is a hospital based prospective study. All newborn term & preterm babies admitted to the department of pediatrics at our hospital, from birth to 28 days of age during jan 2012-oct 2013 was included in the study. After obtaining clearance from institutional ethics committee, 1871 no of neonates among 3335 LBW newborn born in the dept. Fulfilling the inclusion/ exclusion criteria was taken into the study. The analysis will be done in all the in hospital cases wherever indicated as per standard protocol. In all newborn and their respective mothers; relevant information was collected in a predesigned proforma which addressed detailed history, physical examination anthropometric measurement and laboratory parameters. The neonates were classified by gestational age on the basis of the new Ballard score expanded to include extremely premature neonates as preterm<37 completed wks (259 days) and term 37-41wks(260-294 days). All the information regarding maternal history were collected and findings of physical & laboratory examination were recorded. The detailed examination of the baby was done, its weight and any congenital malformation were noted. Clinical examination was done regularly to assess the complication of prematurity and SGA i.e. Hypoglycemia, hypothermia, convulsion, RDS, apnea, anemia, jaundice, NEC and septicemia.

## III. Result

In the present study the incidence of LBW babies was 56.1% of the newborn admission , about 24.79% were VLBW babies and 4.91% were ELBW babies. We had a higher incidence of LBW babies in our study(56.1%) in compared to the national incidence of 28% as because the study was a hospital based study as our hospital is a tertiary care hospital and admit all referral cases of nearby districts and there was a selection bias in admission of cases. Out of 1871 LBW babies, majority (64.02%) were preterm LBW babies and 35.98% babies were term SGA babies. The sex ratio (male:female) was 2.8:1. The higher % of male LBW babies in our study was because of the preferential admission of male newborn in this part of the country.

About 48.04% of the LBW babies had a birth weight between 1500-1999 gm whereas 22.23% babies weighted between 2000-2499 gm and 24.79% babies weighted between 1000-1499 gm. The high incidence of VLBW babies in our hospital may be due to the fact that it is a referral hospital from nearby districts.

It was observed that the risk of LBW babies was more in the primigravida mothers and there was a higher incidence of LBW babies in younger age group mothers. The mean maternal age was 23.97 yrs, the maternal height was 143.96 cm and the mean maternal weight was 44.52 kg. Maternal height less than 145 cm was found to be a significant risk factor(72%) among the LBW babies.

The study revealed that maternal anemia, exposure to smoke, preeclampsia, APH,PROM, bad obstetrics history were risk factors for the LBW babies.

There were few cases of hypertension , diabetes and heart diseases in our study group, though the incidence of diabetes and hypertension are less in child bearing age group in our country. The complication of the LBW babies in the neonatal period was studied. Hypoglycemia was observed in 3.74% of LBW babies and that 4.38 % of cases suffered from hypothermia. 52% babies were suffering from hyperbilirubinemia and hypoxic ischemic encephalopathy was observed in 35% of cases. Respiratory distress occurred in 14.27% of cases and PDA was observed in 2.08% of cases. In our study ich was developed in 1.65% of cases and 45.96% babies developed septicemia. From our study it was found that about 79.05% of term babies and 73.2% babies preterm babies were successfully managed and discharged from the hospital. 7.75% of preterm and 5.82% of term babies needed intensive care treatment.7.34% of preterm LBW babies and 10.69% term babies discontinued treatment and left hospital against medical advice. Death rate among preterm (19.44%) is more than term(10.25%)LBW babies. The mortality rate among ELBW infant was 33.69% and 27.8% among 1000-1499 gm LBW group babies. Mortality rate is low(9.37%) in higher birth weight(2000-2499 gm) group.

**Table 7** Risk factors according to maternal age , height ,And weight for lbw babies

| Wt of baby (gm) | Mean mat Age | Mean mat Ht | Mean mat Wt |
|-----------------|--------------|-------------|-------------|
| 500-999         | 23.94        | 143.94      | 44.55       |
| 1000-1499       | 23.97        | 143.96      | 44.52       |
| 1500-1999       | 24.01        | 143.98      | 44.51       |
| 2000-2499       | 23.96        | 143.97      | 44.51       |

**Table 8** Lbw babies in relation to maternal parity

| Parity | No of lbw | %     |
|--------|-----------|-------|
| P1     | 1268      | 67.77 |
| P2     | 377       | 20.14 |
| P3     | 177       | 9.46  |
| P4     | 29        | 1.54  |
| P5     | 18        | 0.96  |

In our study maximum number (67.77%) of mother of LBW babies were primigravida, 20.14% were second gravida and less number of mother were grand multigravida.

#### IV. Discussion

About 1871 cases of LBW babies amounting to 56.1% of the 3335 new born admission during the period from 2013-2014 were included in our study. However a hospital based study like this may not be true representative of population at large, as majority of deliveries are still conducted at home and this shows the picture of all referral cases as our hospital is a tertiary care hospital and only out born babies are admitted. A community based study might have a different incidence.

The incidence of low birth weight in the country is estimated at around 22.5%<sup>(1)</sup>. The basis for this has mainly come from hospital based data. The data shows a wide range from 2.7% to 40%. In rural india almost 90% of deliveries occur at domiciliary level are conducted by traditional birth attendants. Weighing them soon after birth poses a considerable challenge.<sup>(2,3,4)</sup> The comprehensive rural health services project (CRHSP) ballabgarh<sup>(3)</sup> was run by the all India institute of medical sciences, new delhi(2001) in active collaboration with the state government of haryana. The incidence of low birth weight babies is 8.8 % with only 2 newborn having a birth weight <1800gm.

In our study nearly 31.05 % of the preterm LBW babies were in 34-36 wks group, 14.69 % of cases were in the 31-33 wks group; 16.94% of cases were in 28-30 wks, small no of cases (1.33%) were in <28 wks group, and about 36% cases were >36wks gestation.

A study by singh et al<sup>(5)</sup> showed that 3.6% of preterm were <28 wks of gestation; 37.7% were in 28-34 wks and 48.6% in 34-36 wks of gestation. Only 10.1 % of cases were >36 wks gestation.

**Table 7** shows that the mean maternal age was 23.97 yrs, the maternal height was 143.96 cm and the mean maternal weight was 44.52 kg. Mother weight is a measure of her nutrition, and reflects the nutritional stores potentially available for the developing foetus. Low pre conceptional maternal weight i.e., <45 kg is a known risk factor associated with LBW<sup>(6,7)</sup>. In our study the mean maternal weight was 44.52 kg. As we could not measure the pre- pregnancy weight, we used post partum maternal weight as the criteria. In our study, we observed that the mean maternal height of LBW babies was 143.96, which was close to our study.

There are many studies<sup>(8,9,10)</sup> which report that primi parity and grand multiparity<sup>(11,12,13)</sup> in our study maximum number (67.77%) of mother of lbw babies were primi gravid, 20.14% were second gravida and less number of mother were grand multi gravid Both single and multiple pregnancy were risk factor for LBW. The percentage of lbw babies in relation to multiple pregnancy was 16%. Similar observation were made by **caspi et al**. The effect of maternal anemia on low birth weight is mostly vivid as our observation was similar to that of **mavalankar et al**<sup>(14)</sup> and **desmukh et al**<sup>(15)</sup>

Preeclampsia has been found to be associated with LBW since a very long time. We also found that preeclampsia in mother was associated with LBW babies in 1.33% of cases. In our study it was found that APH(1.06%), premature rupture of membrane(13.41%), bad obstetric history (2.4%) were risk factors for LBW. There were few cases of hypertension diabetes and heart diseases in our study group, though the incidence of hypertension and diabetes are less in child bearing age group in our country

**Chart 11** shows the complication of LBW babies. National neonatal perinatal database showed that only 0.9% LBW babies were suffering from hypoglycemia. In our study, hypoglycemia was observed in 3.74% of LBW babies. LBW babies have less brown fat and thus they are more prone to develop hypothermia. The complication such as birth asphyxia and hypoglycemia which are commonly associated with LBW also increase the risk of hypothermia (meherban singh) in our study, it was observed that 4.38 % of cases suffered from hypothermia. **Naskar n. Et al**<sup>(16)</sup> observed in their study that hyperbilirubinemia is a major problem (43.31%) in VLBW babies. In our study 52% babies were suffering from hyperbilirubinemia. **Fetzhardinge et al**<sup>(17)</sup> and **bhalla et al**<sup>(18)</sup> have reported that the incidence of hypoxic ischemic encephalopathy was 30% and 29% respectively. In our study hypoxic ischemic encephalopathy was observed in 35% of cases. In our study 4.64% babies developed apnea. As ELBW babies number in our study is very less (4.91%) and no. Of < 28 babies are also very less. That may be the cause of less no of apnea in our study compared to above study. In our study respiratory distress was observed in 14.27% of LBW babies.

**Table 12** shows the outcome of LBW baby.

This study suggests that 73.2% of preterm babies were discharged and 7.75 % babies were shifted to intensive care unit, 7.34 % babies went lama .the mortality rate among the preterm babies was found to be 19.44%. Comparatively 79.05% of term babies were discharged, 5.82 % babies needed ICU care, 10.69% went lama. The mortality rate among the term lbw babies found to be 10.25%. Reports of survival among VLBW and ELBW infants by **suthida et al** <sup>(19)</sup> showed that the mortality rate to be 19% which is similar to our study.

## V. Conclusion

The present study showed that LBW is a major health problem encountered in our day to day hospital practice; majority being preterm. The major maternal risk factors associated with the incidence of LBW babies were anemia, malnutrition, preeclampsia, bad obstetrics history, APH, Premature rupture of membrane, short stature , chronic illness . Strengthening of the existing maternal services at the community level with improvement of perinatal care is required to prevent incidence of LBW babies and its associated complication. The major problems encountered in the LBW babies were septicemia, jaundice, birth asphyxia, RDS, NEC, ICH, Hypoglycemia, Hypothermia. Singleton gestation , higher birth weight and gestational age were each associated with improved survival. This study was a hospital based study and the result thus obtained may not give a true picture of the community.

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