

A Hospital Based Prospective Study to Evaluate the Outcome of Very Low Birth Weight (VLBW) Neonates Discharged from District Hospital

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Abstract

Background: Birth weight is the most important determinant of perinatal, neonatal and postnatal outcomes. The main reason for increasing morbidity & mortality in VLBW neonates is due to their physiologic & metabolic immaturity. The aim of this study to assessed the morbidity and mortality profile in very low birth weight neonates in Neonatal Intensive Care Unit in District hospital in Rajasthan. **Materials & Methods:** A hospital based prospective observational study was conducted in the Department of Pediatrics, District hospital, Dholpur, Rajasthan, India during one year period. All VLBW neonates were included in the study after getting written informed consent from the parents for using their neonates' clinical data for the study purpose. All VLBW neonates admitted in our NICU were enrolled in the study. Relevant details were collected which includes maternal details like their age, address, socioeconomic status, educational status, maternal weight, risk factors, gestational age, Antenatal steroids, premature rupture of membranes, mode of delivery and Baby's details include their sex, need of resuscitation, Apgar score, gestational age, birth weight and their illness, need of mechanical ventilation and surfactant therapy were recorded. **Results:** Our study showed that maternal age < 18 years were 2 (2%) and most of the mothers were in the age 18-21 years – 35 (35%). Maternal hypertension being the most common cause for VLBW babies. Place of birth, mode of delivery and gender had no correlation with outcome of very low birth weight neonates (P=0.082, p=0.076, P=0.067 respectively). There is significant association of gestational age with outcome of very low birth weight neonates (P<0.05*). **Conclusion:** Prematurity is the primary cause behind this neonatal death. This emphasizes the need to prevent preterm deliveries. Effective preventive strategies to decrease the preterm birth can only be the next big step to decrease the perinatal morbidity rate of our state.

Keywords: VLBW, Outcome, Mortality, Birth Weight.

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Introduction

Birth weight is the most important determinant of perinatal, neonatal and postnatal outcomes. It is dependent on the length of the gestation and the intrauterine growth of the fetus[1]. The incidence of VLBW babies is less than 2 % of the births globally. In India, VLBW babies constitute 4 % to 7 % of live births and approximately 30 % of Neonatal death. The VLBW rate is an accurate predictor of the infant mortality rate. VLBW infants account for more than 50% of neonatal death[2].

The WHO defines Very low birth weight neonates as birth weight less than 1500g at birth irrespective of gestational age. Neonatal mortality rate is an important contributing factor for underfive mortality rate. Out of the 26 lakh neonatal deaths occurring worldwide per year, 6.4 lakh neonatal deaths occur in India[2]. The main reason for increasing morbidity & mortality in VLBW neonates is due to their physiologic & metabolic immaturity. These neonates are prone for increased risk of hypoglycemia, jaundice, infection & re-hospitalization during their neonatal period. VLBW is one of the most serious challenges in Maternal and Child Health in developing countries[3].

Nearly half of neonates who survive to hospital discharge have complications later which will affect the quality of their life. Despite improvement in the neonatal care & facilities, neonatal mortality remains high particularly in the developing countries[3]. The aim of this study to assessed the morbidity and mortality profile in very low birth weight neonates in Neonatal Intensive Care Unit in District hospital in Rajasthan.

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Materials & methods

A hospital based prospective observational study was conducted in the Department of Pediatrics, District hospital, Dholpur, Rajasthan, India during one year period. All VLBW neonates were included in the study after getting written informed consent from the parents for using their neonates' clinical data for the study purpose.

Inclusion Criteria

All very low birth weight neonates admitted in NICU.

Exclusion Criteria

1. Neonates with major congenital anomalies.
2. Neonates with clinically identified chromosomal syndromes

Methods

All VLBW neonates admitted in our NICU were enrolled in the study. Relevant details were collected which includes maternal details like their age, address, socioeconomic status, educational status, maternal weight, risk factors, gestational age, Antenatal steroids, premature rupture of membranes, mode of delivery and Baby's details include their sex, need of resuscitation, Apgar score, gestational age, birth weight and their illness, need of mechanical ventilation and surfactant therapy were recorded.

Routine Care in Delivery Room

Low risk neonates may initially be placed on mother's abdomen after delivery. Secretions from mouth can be cleared using a bulb syringe or soft catheter. Spontaneously breathing neonates with no distress do not need any assisted method to clear their airway. Delayed clamping of cord (30 s) has value in reducing the incidence of anemia in infancy. Apgar score is a routine method of systematically assessing newborn infants immediately after birth. It was not designed to predict the neurological outcome. The incidence of cerebral palsy is

low in neonates with Apgar scores of 0-3 at 5 minutes, but higher than in infants with Apgar scores of 7-10. Low Apgar score and umbilical artery blood pH predict neonatal death.

Results

Our study showed that maternal age < 18 years were 2 (2%) and most of the mothers were in the age 18-21 years – 35 (35%) followed by 50 (50%) between 21-30 years, 13 (13%) in the age > 30 years. Maternal hypertension being the most common cause for VLBW babies. Most of the mothers belong to low socioeconomic status (table 1 & 2).

Table 1: Distribution of patients according to Maternal age (years)

| Maternal age (years) | No. of patients | Percentage |
|----------------------|-----------------|-------------|
| <18 years | 2 | 2% |
| 18-21 years | 35 | 35% |
| 21-30 years | 50 | 50% |
| >30 years | 13 | 13% |
| Total | 100 | 100% |

Table 2: Distribution of patients according to maternal disease

| Maternal disease | No. of patients | Percentage |
|---------------------------------|-----------------|-------------|
| No risk | 25 | 25% |
| Gestational hypertension | 55 | 55% |
| Anemia | 17 | 17% |
| Hypothyroid | 1 | 1% |
| Gestational diabetes | 2 | 2% |
| Total | 100 | 100% |

Place of birth, mode of delivery and gender had no correlation with outcome of very low birth weight neonates (P=0.082, p=0.076, P=0.067 respectively). There is significant association of gestational age with outcome of very low birth weight neonates (P<0.05*) (table 3).

Table 3: Association Of Various parameters With Outcome

| Parameters | Outcome | | Total (N=100) | P-value |
|-------------------------|-----------------|--------------|---------------|---------|
| | Survival (N=75) | Death (N=25) | | |
| Gender | | | | |
| Male | 35 | 17 | 52 | >0.05 |
| Female | 40 | 8 | 48 | |
| Locality | | | | |
| Inborn | 45 | 15 | 60 | >0.05 |
| Outborn | 30 | 10 | 40 | |
| Gestational age | | | | |
| <28 weeks | 2 | 4 | 6 | <0.05* |
| 28-32 weeks | 42 | 17 | 59 | |
| 32-34 weeks | 21 | 3 | 24 | |
| 34-36 weeks | 10 | 1 | 11 | |
| Mode of delivery | | | | |
| Normal | 37 | 14 | 51 | >0.05 |
| LSCS | 38 | 11 | 49 | |

Table 4 shows the major cause of mortality in VLBW neonates were found to be Sepsis 13 (52%), followed by respiratory distress syndrome 10 (40%). Other causes accounted to 8% of total VLBW neonatal death.

Table 4: Cause of death

| Mortality | No. of patients | Percentage |
|---------------------|-----------------|------------|
| Sepsis | 13 | 52% |
| RDS | 10 | 40% |
| Pneumothorax | 1 | 4% |
| IVH | 1 | 4% |
| Total | 25 | 25% |

Discussion

Neonatal Mortality statistics serve as sensitive indicators of the availability, utilization, and effectiveness of maternal child health service in the community. The incidence of Neonatal Mortality rate is variable from place to place and is also different from hospital to hospital and home born babies. Data derived from hospital record do not truly represent Neonatal Mortality rate and its various causes in the community at large but has the advantage of being more reliable in term of causes of death and reflect the quality of service available[4].

In Jaiswal et al[5] study, Neonatal jaundice requiring phototherapy (55.1%) followed by respiratory morbidity (10.5%) and hypoglycemic (8.8%) were the frequent identified morbidities in late

preterm infants. Sepsis (52%) found to be the major morbidity in our study. Multiple gestation, IUGR and cesarean deliveries were found to be the risk factors for morbidity in Jaiswal et al. study. But in our study, Gestational hypertension (55%) followed by anemia (17%) were the major risk factors. Cesarean delivery and normal vaginal delivery were found to be equal and does not contribute to morbidity in VLBW neonates in our study. In schinder et al[6]. study, IVH followed acute respiratory illness & sepsis were the most common cause of death.

In Kaur A.et al[7] study, sepsis was the major cause of morbidity followed by HMD and Jaundice. Majority of them were in the gestational age 33-36 weeks (n=68, 44.2%), small for gestational age (n=89, 57.8). Similar to this study, Sepsis and RDS were the major

cause of morbidity in VLBW neonates in our study. But most of them were in the gestational age between 28-32 weeks (59%) and 32-34 weeks (24%).

In Sangamam et al[8]. study, the most common morbidity was Hyperbilirubinemia (16.77%) followed by Hypoglycemia (14.99%) and Hyaline membrane disease (14.86 %). Maternal hypertension and anemia being the most common risk factors leading to VLBW in our study. Hypoglycemia accounts for 2(2%) of morbidity in our study. Preterm infants are at risk of developing hypoglycemia after birth, because they have immature hepatic glycogenolysis and adipose tissue lipolysis, hormonal dysregulation and deficient hepatic gluconeogenesis and ketogenesis.

There was no association of gender, birth, locality and sex with outcome. Gestational age and Mechanical ventilation had positive correlation with outcome. As the gestational age decreases, both morbidity and mortality increases. Since RDS and sepsis are the major cause of mortality, quality of care in the antenatal, perinatal and postnatal periods of newborn to be improved.

We need to strengthen the ongoing trainings of health care personnel like NRP and to provide appropriate antenatal education and care from the grass root level.

Conclusion

Uplifting the socioeconomic status of women, Nutritional counselling to reduce anemia should be considered to reduce the incidence of very low birth weight babies. Prematurity is the primary cause behind these neonatal death. This emphasizes the need to prevent preterm deliveries. Effective preventive strategies to decrease the preterm

birth can only be the next big step to decrease the perinatal morbidity rate of our state.

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