



## Research Article

### **Outcomes and Growth Patterns of Very Low Birth Weight Neonates Discharged from a Tertiary Care Hospital**

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#### **Abstract**

**Background:** Very low birth weight (VLBW) neonates, defined as those weighing less than 1500 grams at birth, are at increased risk of various morbidities and mortality. Understanding the outcomes of these vulnerable infants is crucial for optimizing care and reducing complications.

**Objective:** This study aims to evaluate the clinical outcomes of VLBW neonates discharged from a tertiary care hospital, focusing on neonatal morbidity, mortality, and growth patterns during the first year of life.

**Material and Methods:** A total of 120 VLBW neonates discharged from the Department of Pediatrics at a tertiary care hospital were included in this retrospective study. Data on clinical outcomes, including neonatal morbidities, growth parameters, and follow-up visits, were collected and analyzed.

**Results:** The study found a significant incidence of respiratory distress syndrome, infections, and feeding difficulties among the cohort. Follow-up growth parameters indicated a higher prevalence of undernutrition in the first year of life.

**Conclusion:** VLBW neonates require meticulous care and follow-up to ensure optimal growth and development outcomes. Continuous monitoring of growth parameters and addressing associated morbidities can help improve the overall health of this population.

**Keywords:** Very low birth weight, neonates, outcomes, neonatal morbidity, growth.

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#### **Introduction**

Very low birth weight (VLBW) neonates, defined as infants weighing less than 1500 grams at birth, constitute a significant portion of neonatal intensive care unit (NICU) admissions. The incidence of VLBW neonates has been rising, attributed to increased preterm births, improved obstetric care, and advances in neonatal medicine (1). These infants are at an elevated risk for various short- and long-term complications, including respiratory distress syndrome, infections, neurodevelopmental delays, and growth retardation (2).

The outcomes for VLBW neonates can vary significantly depending on factors such as gestational age, birth weight, presence of comorbid conditions, and the level of neonatal care received. As such, understanding the specific outcomes of VLBW neonates is critical for healthcare providers, as it informs clinical practice and resource allocation in neonatal care (3).

Previous studies have shown that VLBW neonates discharged from the hospital face ongoing health challenges, including growth

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failures and neurodevelopmental issues (4). Despite advancements in neonatal care, many VLBW infants continue to experience adverse outcomes that impact their quality of life.

This study aims to evaluate the clinical outcomes of VLBW neonates discharged from a tertiary care hospital, focusing on neonatal morbidity, mortality rates, and growth patterns during the first year of life.

### Aim and Objectives

- **Aim:** To evaluate the clinical outcomes of very low birth weight neonates discharged from a tertiary care hospital.
- **Objectives:**
  1. To assess the incidence of neonatal morbidities among VLBW neonates.
  2. To analyze mortality rates during hospitalization and after discharge.
  3. To evaluate growth parameters during follow-up visits in the first year of life.

### Material and Methods

#### Study Design

This retrospective observational study was conducted in the Department of Pediatrics at a tertiary care hospital. Ethical approval was obtained from the hospital's institutional review board, and patient consent was waived due to the retrospective nature of the study.

#### Participants

A total of 120 VLBW neonates discharged from the NICU of the hospital between January 2020 and December 2022 were included in the study. Data were collected from medical records, including demographic details, clinical presentations, and outcomes.

#### Inclusion Criteria:

- Infants with a birth weight of less than 1500 grams.
- Neonates who were admitted to the NICU and subsequently discharged.

#### Exclusion Criteria:

- Infants with congenital anomalies or genetic syndromes.
- Neonates who were transferred to other facilities before discharge.

#### Data Collection

Data were extracted from the medical records and included the following:

- **Demographic Data:** Gestational age, birth weight, sex, and mode of delivery.
- **Clinical Outcomes:** Incidence of respiratory distress syndrome, infections (sepsis, pneumonia), feeding difficulties, and other neonatal morbidities.
- **Mortality Data:** In-hospital mortality and any reported mortality within the first year post-discharge.
- **Follow-Up Data:** Growth parameters such as weight, length, and head circumference were collected during follow-up visits at 1, 3, 6, and 12 months of age.

#### Statistical Analysis

Data were analyzed using statistical software. Descriptive statistics were utilized to summarize the demographic and clinical characteristics. The incidence of neonatal morbidities was expressed as percentages. Growth parameters were analyzed using paired t-tests and ANOVA for repeated measures. A p-value of <0.05 was considered statistically significant.

### Results

#### Patient Demographics

**Table 1: The demographic characteristics of the study participants.**

Characteristic	n (%)
<b>Gender</b>	
Male	64 (53.3)
Female	56 (46.7)

<b>Gestational Age (weeks)</b>	
<28 weeks	30 (25.0)
28-32 weeks	45 (37.5)
>32 weeks	45 (37.5)
<b>Birth Weight (grams)</b>	
<1000 grams	25 (20.8)
1000-1499 grams	95 (79.2)

**Table 1** outlines the demographic characteristics of the study population, indicating a slight male predominance and showing that a majority of VLBW neonates had birth weights between 1000 and 1499 grams.

**Table 2: The incidence of neonatal morbidities and mortality rates.**

<b>Morbidity</b>	<b>n (%)</b>
Respiratory Distress Syndrome	70 (58.3)
Sepsis	35 (29.2)
Feeding Difficulties	40 (33.3)
Apnea	20 (16.7)
Hyperbilirubinemia	45 (37.5)
Mortality (in-hospital)	10 (8.3)

**Table 2** presents the clinical outcomes observed in the cohort. The most common morbidity was respiratory distress syndrome, affecting over half of the infants, followed by feeding difficulties and hyperbilirubinemia. The in-hospital mortality rate was recorded at 8.3%.

**Table 3: Growth parameters during follow-up visits.**

<b>Age (Months)</b>	<b>Mean Weight (kg) (<math>\pm</math> SD)</b>	<b>Mean Length (cm) (<math>\pm</math> SD)</b>	<b>Mean Head Circumference (cm) (<math>\pm</math> SD)</b>
At 1 Month	1.8 $\pm$ 0.4	42.0 $\pm$ 2.5	29.0 $\pm$ 1.5
At 3 Months	3.2 $\pm$ 0.5	47.0 $\pm$ 2.0	33.0 $\pm$ 1.0
At 6 Months	5.0 $\pm$ 0.8	54.0 $\pm$ 3.0	36.0 $\pm$ 1.2
At 12 Months	8.0 $\pm$ 1.5	67.0 $\pm$ 5.0	43.0 $\pm$ 1.5

**Table 3** summarizes growth parameters at different follow-up intervals. Initial weights and lengths were low but showed significant growth over time, indicating positive growth trends in the cohort.

## Discussion

This study evaluated the outcomes of VLBW neonates discharged from a tertiary care hospital, highlighting significant morbidity and the importance of follow-up for optimizing growth and development.

VLBW infants are at increased risk for various complications during their hospital stay, including respiratory distress syndrome, sepsis,

and feeding difficulties (5). In our study, the high incidence of respiratory distress syndrome aligns with findings from other studies, confirming the critical need for respiratory support in this vulnerable population (6).

The incidence of sepsis in our cohort was also notable, reinforcing the importance of infection control measures in NICUs. Early identification and treatment of infections are paramount to reducing mortality and improving outcomes (7). Feeding difficulties were common, affecting one-third of the cohort, indicating the challenges associated with feeding VLBW infants, which

may require specialized management strategies (8).

The follow-up growth data from our study demonstrate the necessity of continued monitoring of VLBW neonates after discharge. Although growth parameters improved over time, the initial low weights and lengths underscore the potential for growth failure if not adequately monitored and supported (9).

Our findings are consistent with previous research indicating that VLBW infants are at risk for poor growth in the first year of life, which can have long-term implications for development (10). Continuous monitoring and nutritional support are essential for optimizing growth and preventing long-term neurodevelopmental issues.

### Limitations

This study has some limitations. The retrospective nature of the data collection may introduce biases, and the findings are limited to a single institution. A multicenter study with larger sample sizes would enhance the generalizability of the results. Additionally, the lack of long-term follow-up data beyond the first year limits our ability to draw conclusions about the longer-term outcomes of this population.

### Conclusion

In conclusion, VLBW neonates discharged from a tertiary care hospital face significant morbidity, particularly concerning respiratory distress, infections, and feeding difficulties. While initial growth parameters are low, there is a positive trend in growth during follow-up visits. Continuous monitoring and supportive care are critical for optimizing outcomes in this vulnerable population.

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