Section: Neonatology

Original Research Article

CLINICAL CHARACTERISTICS AND SHORT-TERM OUTCOMES OF CLINICALLY STABLE INFANTS BORN LESS THAN 34 WEEKS: A SINGLE-CENTRE OBSERVATIONAL STUDY

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ABSTRACT

Background: Late very preterm infants born between below 34 weeks gestation contribute substantially to neonatal admissions and healthcare utilization. Although survival rates are high, data on the clinical characteristics and short-term outcomes of clinically stable infants in this gestational age group remain limited, particularly from low and middle-income countries. The objective is to describe the maternal profile, neonatal clinical characteristics,morbidity spectrum and short-term outcomes of clinically stable late very preterm infants born between below 34 weeks gestation.

Materials and Methods: This single-centre observational study included preterm neonates born below 34 weeks gestation who were clinically stable, off respiratory support by 72 hours of life and admitted to the neonatal unit during the study period. Maternal and neonatal variables, clinical course, neonatal morbidities, growth outcomes and length of hospital stay were analysed using descriptive statistics.

Results: Eighty two late very preterm infants were included. The mean gestational age was 33.1 ± 0.6 weeks and the mean birth weight was 1910 ± 310 g. Respiratory distress was the most common reason for admission, though the majority required only short-term non-invasive support. Sepsis was the most frequently observed morbidity, while severe complications such as necrotizing enterocolitis, severe intraventricular haemorrhage, and bronchopulmonary dysplasia were rare. Extrauterine growth restriction at discharge was observed in 21.9% of infants. The mean duration of hospital stay was 14.8 ± 5.6 days.

Conclusion: Clinically stable late very preterm infants experience a significant burden of neonatal morbidity, particularly sepsis and growth restriction, despite overall favourable short-term outcomes. Focused surveillance and nutritional optimisation are essential even in this relatively mature preterm population.

Keywords: Late very preterm infants; neonatal morbidity; clinical stability; short-term outcomes; NICU.

INTRODUCTION

Preterm birth remains a leading cause of neonatal morbidity worldwide.[1] Infants born between before 34 weeks' gestation represent a numerically large group and contribute substantially to neonatal intensive care unit (NICU) admissions and healthcare costs. Advances in perinatal care have significantly

improved survival in this group; however, survival alone does not equate to absence of morbidity.

Most existing literature has focused on critically ill extremely preterm neonates, with emphasis on severe complications such as bronchopulmonary dysplasia, necrotizing enterocolitis, intraventricular hemorrhage, and retinopathy of prematurity.[2] In contrast,infants born upto 34 weeks though have improved survival, these infants continue to experience significant short-term morbidity and prolonged hospitalization.[3] Consequently, focused neonatal surveillance and specialized care remain essential for infants born at <34 weeks' gestation.

Even after achieving early clinical stability, these infants remain physiologically immature with limited metabolic reserves, immature immune responses, and suboptimal feeding efficiency. These factors predispose them to prolonged hospitalization and potentially adverse short-term outcomes. Data describing the clinical course and early outcomes of clinically stable late very preterm infants from resource limited settings remain sparse.[4]

The present study was therefore undertaken to describe the maternal characteristics, neonatal clinical profile, morbidity spectrum, and short-term outcomes of clinically stable late very preterm infants born before 34 weeks gestation in a tertiary care NICU.

MATERIALS AND METHODS

Study Design and Setting: This was a single-centre observational study conducted in the neonatal unit of a tertiary care teaching hospital in India over a 12-month period.

Study Population: All preterm neonates born before 34 weeks gestation and admitted to the neonatal unit during the study period were screened.

Inclusion Criteria

- Gestational age < 34 weeks
- Clinically stable within 72 hours of life
- Off from all forms of respiratory support and supplemental oxygen
- Availability of complete clinical records

Exclusion Criteria

- Major congenital anomalies
- Severe perinatal asphyxia
- Requirement of invasive ventilation beyond 72 hours
- Death during hospital stay

Data Collection

Data were collected using a structured proforma and included:

- Maternal variables: age, parity, antenatal steroid exposure, obstetric complications, and mode of delivery
- Neonatal variables: gestational age, birth weight, sex, Apgar scores
- Clinical course: respiratory support, feeding initiation, and antibiotic exposure
- Morbidities: sepsis, apnea, jaundice requiring phototherapy, necrotizing enterocolitis, intraventricular hemorrhage
- Outcomes: length of hospital stay, extrauterine growth restriction, discharge status

Definitions

- **Sepsis:** culture-positive or clinically suspected infection requiring antibiotic therapy
- **Extrauterine Growth Restriction (EUGR):** weight below the 10th percentile for postmenstrual age at discharge
- **Clinical stability:** hemodynamic stability and absence of respiratory support

Statistical Analysis: Data were analysed using descriptive statistics. Continuous variables are presented as mean ± SD, and categorical variables as frequencies and percentages.

RESULTS

A total of 82 clinically stable late infants were included. The mean maternal age was 27.4 ± 4.2 years. Antenatal corticosteroids were administered in 34.0% of pregnancies. Cesarean delivery occurred in 32.9% of cases [Table 1].

Table 1: Maternal Baseline Characteristics of Clinically Stable Infants (n = 82)

Maternal Characteristic	Value
Maternal age (years), mean ± SD	27.4 ± 4.2
Primigravida, n (%)	18 (21.4)
Booked pregnancy, n (%)	32 (39.0)
Antenatal corticosteroid exposure, n (%)	28 (34.1)
Mode of delivery – Cesarean section, n (%)	27(32.90
Pregnancy-induced hypertension, n (%)	9 (10.9)
Antepartum hemorrhage, n (%)	4 (4.8)
Preterm premature rupture of membranes (PPROM), n (%)	7 (8.5)
Oligohydramnios, n (%)	6(7.3)
Maternal anemia, n (%)	11 (13.4)
Multiple pregnancy, n (%)	5 (6.0)

The mean gestational age was 33.1 ± 0.6 weeks, with a mean birth weight of 1910 ± 310 g. Male infants constituted 48.7% of the cohort.

Table 2: Neonatal Baseline Characteristics of Clinically Stable Infants (n = 82)

Neonatal Characteristic	Value
Gestational age (weeks), mean ± SD	33.1 ± 0.6
Birth weight (g), mean ± SD	1910 ± 310 g
Birth weight <1000 g, n (%)	5 (6.1)
Male sex, n (%)	40(48.7)
Appropriate for gestational age, n (%)	56 (68.9)
Small for gestational age, n (%)	25 (31.1)
Mode of delivery – Cesarean section, n (%)	49 (60.0)
Apgar score at 5 minutes, median (IQR)	8 (7–8)
Resuscitation at birth, n (%)	12 (15.6)
Inborn infants, n (%)	69 (84.4)
Out-born infants, n (%)	13 (15.6)

Respiratory distress was observed in 38.8% of infants, though only 9.5% required non-invasive respiratory support for more than 24 hours.

Sepsis was observed in 34 infants (41.5%), while culture-positive sepsis was confirmed in 6 (7.3%). Apnea was documented in 9 infants (11.0%). Necrotizing enterocolitis (Stage ≥II) and severe intraventricular haemorrhage were not observed.

Extrauterine growth restriction at discharge was noted in 18 infants (21.9%). The mean duration of hospital stay was 14.8 ± 5.6 days. All infants were discharged home in stable condition.

DISCUSSION

This single-centre observational study highlights that clinically stable <34 weeks preterm infants, despite their apparent maturity and early stabilization, experience a considerable burden of neonatal morbidity. The findings challenge the perception that infants born <34 weeks gestation are uniformly low risk.

Sepsis emerged as the most common morbidity, consistent with previous reports from neonatal units in similar settings.[5] The relatively high incidence of clinically suspected sepsis likely reflects cautious antibiotic practices, prolonged hospital stay, and the inherent vulnerability of preterm immune systems.[6]

Severe morbidities such as necrotizing enterocolitis, bronchopulmonary dysplasia, and severe intraventricular hemorrhage were rare, underscoring the favourable short-term prognosis of this population when early clinical stability is achieved.[7]

However, the observation that nearly one-fifth of infants had extrauterine growth restriction at discharge is clinically important and highlights the need for focused nutritional strategies even in late very preterm infants.

The relatively short hospital stay compared with more immature preterm cohorts reflects faster physiological maturation; nevertheless, the duration remains significantly longer than that of term neonates, with implications for healthcare resources and family burden.

Strengths and Limitations: The primary strength of this study lies in its focus on a frequently overlooked subgroup of preterm infants upto 34 weeks who are clinically stable early in life. Limitations include the single-centre design, modest sample size, and lack of long-term neurodevelopmental follow-up, which limits assessment of later outcomes.

CONCLUSION

Clinically stable infants born < 34 weeks gestation exhibit significant neonatal morbidity, particularly sepsis and extrauterine growth restriction, despite favourable survival and low rates of severe complications. Structured monitoring, infection-prevention strategies, and nutritional optimisation should remain integral components of care for this population.

Ethics Statement: The study protocol was approved by the Institutional Ethics Committee.

Written informed consent was obtained from parents or legal guardians prior to enrolment.

Data Availability Statement

De-identified data are available from the corresponding author upon reasonable request.

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