

Original Article

Outcome of early preterm, late preterm and term infants- A clinical study

Sunil Agarwal

Assistant Professor, Department of Paediatrics, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

ABSTRACT:

Background: Late preterm infants (LPIs), born between 34 0/7 and 36 6/7 weeks' gestational age (GA), account for >70% of preterm deliveries in the United States. The present study was conducted to assess outcome of preterm infants. **Materials & Methods:** 90 early preterm, late preterm and term infants of both genders were classified into 3 groups. Parameters such as hospitalizations, multiple gestation, small for GA status, maternal age etc. were recorded. **Results:** Out of 90 patients, boys were 30 and girls were 60. The mean gestation age was 32.1 weeks in group I and 36.2 weeks in group II and 37.4 weeks in group III. The mean birth weight was 2032.6 grams in group I, 2868.2 grams in group II and 3490.2 grams in group III. Multiple gestation was seen in 4 in group I, 3 in group II and 2 in group III. Small for GA was 3 in group I, 3 in group II and 2 in group III. The difference was significant ($P < 0.05$). The mean birth hospitalization length was 13.5 days, 2.5 days and 2.0 days. Hospitalization within 14 days of birth discharge was seen in 3.2%, 3.5% and 3.1%. Hospitalization within 30 days of birth discharge was seen in 6.7%, 5.3% and 3.2%. Hospitalization within 90 days of birth discharge was seen in 10.5%, 8.1% and 5.4%. Hospitalization between birth discharge and day 365 of life was seen in 17.5%, 13.4% and 9.2% in group I, II and III respectively. The difference was significant ($P < 0.05$). **Conclusion:** There was high rate of hospitalization in early preterm infants as compared to late preterm and term infants.

Key words: Preterm infants, Outcome, Gestation age

Corresponding author: Sunil Agarwal, Assistant Professor, Department of Paediatrics, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

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INTRODUCTION

Late preterm infants (LPIs), born between 34 0/7 and 36 6/7 weeks' gestational age (GA), account for >70% of preterm deliveries in the United States. Late preterm infants face more problems in the immediate newborn period compared with their full-term counterparts.¹ Concerns about higher morbidity and mortality in this demographic during childbirth hospitalisation are being raised by an increasing body of studies. Within the first 14 days, 28 days, and one year following discharge, studies looking at longer-term outcomes have found that LPIs have a higher chance of hospitalisation and higher associated expenses than term babies (TIs).²

The evidence acknowledges that late preterm infants have readmission rates that are 1.5 to 3 times higher than term infants, indicating that this excess morbidity persists after the initial hospitalisation for birth. Jaundice and feeding issues are by far the most common causes of rehospitalization in this group of newborns. Serious negative events including necrotizing enterocolitis and grade 3 or 4 intraventricular haemorrhage were uncommon.³ Respiratory distress, sepsis work-ups, and phototherapy for hyperbilirubinemia were the most frequent unfavourable effects. Preterm infants are more susceptible to neurological complications such as

intraventricular hemorrhage (bleeding in the brain), periventricular leukomalacia (damage to white matter), and cerebral palsy. The severity of these complications can vary and may have long-term effects on motor control and cognitive function.⁴

Preterm infants often have underdeveloped lungs, which can lead to respiratory distress syndrome (RDS). This condition makes it difficult for the baby to breathe and may require respiratory support, such as oxygen therapy or mechanical ventilation.⁵ With appropriate medical care, most infants recover from RDS, although some may develop chronic lung disease (bronchopulmonary dysplasia). Preterm infants may have difficulties with feeding due to immature sucking and swallowing reflexes.⁶ They may require specialized feeding techniques or temporary supplementation with tube feeding or intravenous nutrition until they can feed effectively.⁷ The present study was conducted to assess outcome of preterm infants.

MATERIALS & METHODS

The present study comprised of 90 preterm infants of both genders. Parents gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups of 30 each. Group

I comprised of early preterm, group II late preterm and group III term infants. Parameters such as increased hospitalizations, multiple gestation, small for GA status, maternal age, maternal parity, trimester of

prenatal care initiation etc. were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

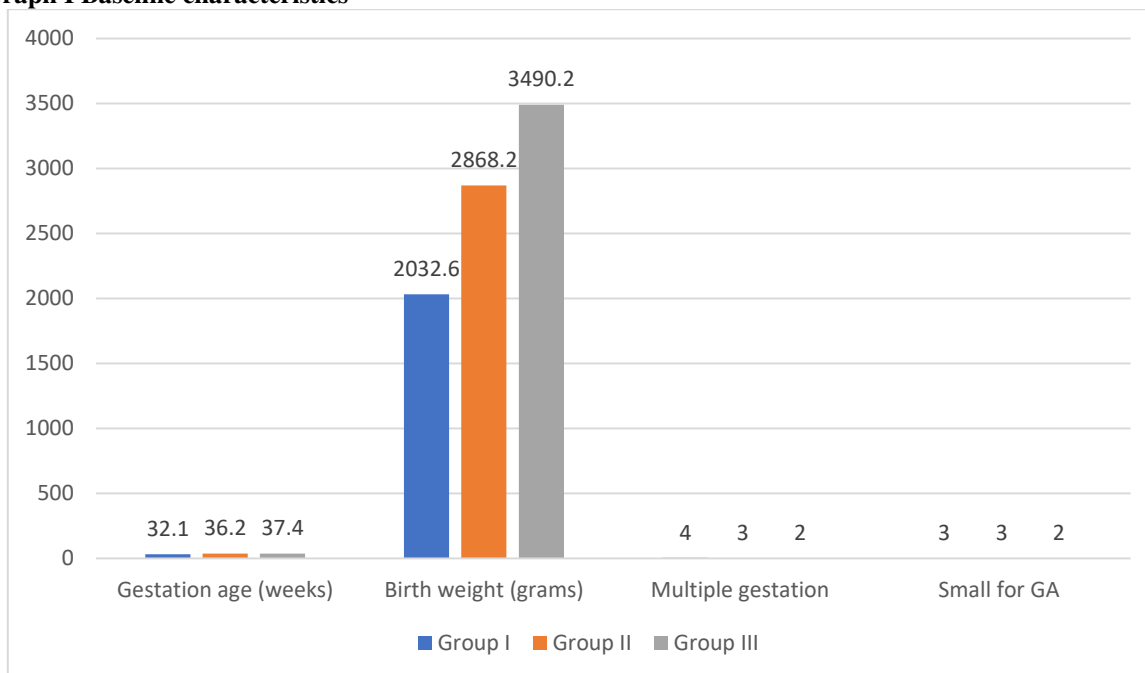
RESULTS

Table I Distribution of patients

Total- 90		
Gender	Boys	Girls
Number	30	60

Table I shows that out of 90 patients, boys were 30 and girls were 60.

Graph I Baseline characteristics



Graph I shows that mean gestation age was 32.1 weeks in group I and 36.2 weeks in group II and 37.4 weeks in group III. The mean birth weight was 2032.6 grams in group I, 2868.2 grams in group II and 3490.2 grams in group III. Multiple gestation was seen in 4 in group I, 3 in group II and 2 in group III. Small for GA was 3 in group I, 3 in group II and 2 in group III. The difference was significant (P< 0.05).

Table II Assessment of hospitalization

Parameters	Variables	Group I	Group II	Group III	P value
hospitalization	Birth hospitalization length (days)	13.5	2.5	2.0	0.05
	within 14 days	3.2%	3.5%	3.1%	0.92
	within 30 days	6.7%	5.3%	3.2%	0.05
	within 90 days	10.5%	8.1%	5.4%	0.18
	within 365 days of life	17.5%	13.4%	9.2%	0.37

Table II shows that mean birth hospitalization length was 13.5 days, 2.5 days and 2.0 days. Hospitalization within 14 days of birth discharge was seen in 3.2%, 3.5% and 3.1%. Hospitalization within 30 days of birth discharge was seen in 6.7%, 5.3% and 3.2%. Hospitalization within 90 days of birth discharge was seen in 10.5%, 8.1% and 5.4%. Hospitalization between birth discharge and day 365 of life was seen in 17.5%, 13.4% and 9.2% in group I, II and III respectively. The difference was significant (P< 0.05).

DISCUSSION

The outcomes for preterm infants can vary depending on several factors, including the degree of prematurity, overall health at birth, and the quality of medical care received.^{8,9} With advancements in medical care and technology, the survival rates for preterm infants have improved significantly.¹⁰ However, extremely preterm infants (born before 28 weeks of gestation) still face higher risks of mortality compared to infants born closer to full term.¹¹ The present study was conducted to assess outcome of preterm infants.

We found that out of 90 patients, boys were 30 and girls were 60. In order to compare late-preterm and term (37–41 weeks gestation) infants, Shapiro-Mendoza et al¹² evaluated the individual and combined impacts of these exposures on the risk of newborn morbidity. In this study, there were 377,638 term births and 26,170 late preterm births. Neonatal morbidity was 7 times more prevalent in late-preterm infants than in term infants (22% vs 3%). Each week of pregnancy before 38 weeks saw a doubling of the newborn morbidity rate. In comparison to equally exposed term children, late-preterm infants whose mothers had any of the maternal diseases evaluated were more likely to experience newborn morbidity. Infants born late in the pregnancy who experienced antepartum haemorrhage and hypertensive disorders of pregnancy were particularly at risk.

We observed that mean gestation age was 32.1 weeks in group I and 36.2 weeks in group II and 37.4 weeks in group III. The mean birth weight was 2032.6 grams in group I, 2868.2 grams in group II and 3490.2 grams in group III. Multiple gestation was seen in 4 in group I, 3 in group II and 2 in group III. Small for GA was 3 in group I, 3 in group II and 2 in group III. Preterm infants have a higher risk of infections, including sepsis and pneumonia, as their immune systems are less developed. Careful monitoring and infection prevention measures are crucial in neonatal intensive care units to minimize these risks. It's important to note that each preterm infant is unique, and outcomes can vary widely. Some preterm infants may face significant challenges, while others may have better outcomes and catch up to their full-term peers over time. Close medical follow-up, early intervention services, and supportive care from healthcare professionals and caregivers play essential roles in optimizing outcomes for preterm infants.¹³

We found that mean birth hospitalization length was 13.5 days, 2.5 days and 2.0 days. Hospitalization within 14 days of birth discharge was seen in 3.2%, 3.5% and 3.1%. Hospitalization within 30 days of birth discharge was seen in 6.7%, 5.3% and 3.2%. Hospitalization within 90 days of birth discharge was seen in 10.5%, 8.1% and 5.4%. Hospitalization between birth discharge and day 365 of life was seen in 17.5%, 13.4% and 9.2% in group I, II and III respectively. According to Ray et al.'s¹⁴ hypothesis, late preterm children have an even higher risk of certain hospitalisations, like hyperbilirubinemia, but the odds of any hospitalisation typically decline with increasing GA. The likelihood of any hospitalisation during the first year of life declined as GA advanced, but for infants with 35-, 36-, and 37-week GA, observed odds of any hospitalisation were higher than anticipated odds for all time periods following discharge. A relative peak in the likelihood of any hospitalisation for particular infections was noted among infants 33 to 36 weeks' GA, and the odds of any hospitalisation for hyperbilirubinemia were

highest for infants 33 to 38 weeks' GA (peak odds ratio at 36 weeks' GA: 2.86).

The limitation the study is small sample size.

CONCLUSION

Authors found that there was high rate of hospitalization in early preterm infants as compared to late preterm and term infants.

REFERENCES

1. Chamberlain JM, Joseph JG, Patel KM, Pollack MM. Differences in severity-adjusted pediatric hospitalization rates are associated with race/ethnicity. *Pediatrics*. 2007;119(6).
2. Koehoorn M, Karr CJ, Demers PA, Lencar C, Tamburic L, Brauer M. Descriptive epidemiological features of bronchiolitis in a population-based cohort. *Pediatrics*. 2008; 122(6):1196–1203.
3. Jain S, Cheng J. Emergency department visits and rehospitalizations in late preterm infants. *Clin Perinatol*. 2006;33(4):935–945.
4. Herrchen B, Gould JB, Nesbitt TS. Vital statistics linked birth/infant death and hospital discharge record linkage for epidemiological studies. *Comput Biomed Res*. 1997;30(4): 290–305.
5. Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. *JAMA*. 1992;268(17):2388–2394.
6. Vu LT, Muhajarine N. Neighbourhood effects on hospitalization in early childhood. *Can J Public Health*. 2010;101(2):119–123.
7. Davidson R, Roberts SE, Wotton CJ, Goldacre MJ. Influence of maternal and perinatal factors on subsequent hospitalisation for asthma in children: evidence from the Oxford record linkage study. *BMC Pulm Med*. 2010; 10:14.
8. Sun GW, Shook TL, Kay GL. Inappropriate use of bivariable analysis to screen risk factors for use in multivariable analysis. *J Clin Epidemiol*. 1996;49(8):907–916.
9. Escobar GJ, Clark RH, Greene JD. Shortterm outcomes of infants born at 35 and 36 weeks gestation: we need to ask more questions. *Semin Perinatol*. 2006;30(1):28–33.
10. Jain S, Cheng J. Emergency department visits and rehospitalizations in late preterm infants. *Clin Perinatol*. 2006;33(4):935–945
11. Burgos AE, Schmitt SK, Stevenson DK, Phibbs CS. Readmission for neonatal jaundice in California, 1991-2000: trends and implications. *Pediatrics*. 2008;121(4).
12. Shapiro-Mendoza CK, Tomaszek KM, Kotelchuck M, et al. Effect of late-preterm birth and maternal medical conditions on newborn morbidity risk. *Pediatrics*. 2008; 121(2).
13. McIntire DD, Leveno KJ. Neonatal mortality and morbidity rates in late preterm births compared with births at term. *Obstetrics & Gynecology*. 2008 Jan 1;111(1):35-41.
14. Ray KN, Lorch SA. Hospitalization of early preterm, late preterm, and term infants during the first year of life by gestational age. *Hospital Pediatrics*. 2013 Jul 1;3(3):194-203.