

A CLINICAL STUDY OF MORBIDITY AND MORTALITY PATTERN OF LATE PRETERM INFANTS AT SNCU, WARANGAL

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ABSTRACT

OBJECTIVE

A clinical study of morbidity and mortality pattern of late preterm infants in comparison with term infants.

STUDY DESIGN

Prospective observational study.

SETTING

SNCU, Mahatma Gandhi Memorial Hospital, Warangal.

SUBJECTS

Consecutive sample of late preterm infants and term infants referred to our hospital on or before fourth day of life.

RESULTS

76 late preterm infants and 76 term infants with any of the pre-defined neonatal condition were included in the study. Late preterm infants were significantly at a higher risk for overall morbidity including hypothermia, sepsis, respiratory morbidity, jaundice, hypoglycemia, birth asphyxia. A trend towards higher mortality was also seen.

CONCLUSION

In an out born referral center, late preterm infants are more prone to suffer from morbidities than term infants. Hypothermia is the leading cause of morbidity in both term (61%) and late pre-term (85%) infants.

KEYWORDS

Late Preterm Infants, Morbidity, Mortality.

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INTRODUCTION

Late preterm infants, defined by birth at 34^{0/7} through 36^{6/7} weeks' gestation are physiologically and metabolically less mature than term infants. Thus they are at a higher risk of morbidity and mortality than term infants.^(1,2) Preterm labor, pre-eclampsia and premature rupture of membranes are known contributors to preterm birth; however, recent spike in inductions, caesarean sections and other obstetrical practices as well as a modest change in maternal demographics have played a key role in the increase in late preterm birth.^(3,4) Late preterm infants can present with a multitude of clinical problems including respiratory distress, hyperbilirubinemia, temperature instability, feeding difficulties, hypoglycemia, apnea and late onset sepsis leading to prolonged hospital stay and readmission after discharge.

There is often a false sense of security among birth attendants and families regarding late preterm infants as their size and birth weight appear near normal, hence are less prepared for a medical issue.

However, recent data from worldwide including our country suggests that late preterm infants physiologically behave more as preterm and not as term infants.⁽⁵⁾

Understanding morbidity risk among late preterm infants is not only important for helping new-born care providers to anticipate and manage potential morbidity during the birth hospitalization and earlier followup after hospital discharge, but may also possibly assist in guiding non-emergency obstetric intervention decisions.⁽⁵⁾ Moreover, majority of previous studies were done in urban areas, hence an attempt was made to recognize proportions of different morbidities and mortality pattern of all late preterm infants who reported on or before 4th day of life and in comparison to equal number of term infants admitted in SNCU (Sick Care Newborn Unit), MGM Hospital, Warangal, Telangana. This is a regional tertiary government hospital in the district catering to population predominantly hailing from surrounding rural areas and low socio-economic group.

METHOD

This hospital based prospective observational study conducted at SNCU, Mahatma Gandhi Memorial Hospital, Warangal. This study was approved by Hospital Ethical Committee. Consecutive sample of late preterm infants (34^{0/7} to 36^{6/7}) and term infants (37^{0/7} to 41^{6/7}) admitted on or before 4th day of life whose parents had given consent to participate in the study were enrolled. This study was conducted between December 2013 and May 2014.

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Infants with major congenital malformation and clinically identifiable syndromes were excluded. Gestational age was assessed with expanded new Ballard score or based on LMP dating.

The findings of the infants were documented on a regular basis during hospital stay till discharge or death in a predesigned proforma. No follow-up was done after discharge.

DEFINITION OF VARIABLES

Any of the following pre-defined medical condition resulting in admission during first four days of life – (i) Hypothermia: Axillary temperature less than 36°C using low reading clinical thermometer, documented any time during hospital stay, (ii) Hypoglycemia: Random blood sugar was done using glucometer (GRBS) and if the value was less than 45mg/dL (As per SNCU guidelines) was considered as hypoglycemia. GRBS was done for all infants on admission and subsequently in accordance with clinical situation. (iii) Apnea: Apnea was defined as cessation of airflow >20sec and/or bradycardia with heart rate <100 beats/min or hypoxemia detected clinically by cyanosis or by oxygen saturation monitor along with cessation of airflow. (iv) Sepsis: Probable sepsis was considered when septic screen was positive (two of the five parameters were positive, namely total Leucocyte count <5000/mm³ or >15000/mm³, band to total polymorph ratio >0.2, absolute neutrophil count less than 1800/mm³, C-reactive protein >0.5mg/dL, micro ESR >15mm/1st hour). Proven sepsis was defined as isolation of pathogen from blood or urine or CSF. Both probable sepsis and proven sepsis were included under this category. (v) Jaundice: Clinically visible jaundice requiring phototherapy as per hour specific Total Serum Bilirubin (TSB) nomogram (American Academy of Paediatrics bilirubin nomogram.⁽⁶⁾ (vi) Respiratory distress: According to SNCU guidelines, respiratory rate >60/min and/or having grunt or chest retractions. Respiratory morbidities were defined as per National Neonatal Perinatal Database (NNPD) definitions.⁽⁷⁾ (vii) Birth Asphyxia: Based on Apgar data from the referral letter or history of delayed cry (Initiation of cry after one minute of life).

STATISTICAL ANALYSIS

Statistical analysis was done using Chi-square test Yates correction wherever applicable or student ‘t’ test for comparing proportions or means respectively based on type of the variable. Odds ratios with 95% confidence intervals were calculated for variables.

RESULTS

76 late preterm and an equal number of term infants were enrolled. The mean gestation of late preterm group and term infants were 36.1 and 38.5 weeks respectively. The mean birth weight were 2228g and 3125g respectively. Mode of delivery was similar between the groups (Table 1).

Variable	Late Pre term (n 76)	Term (n 76)	p value
Gestation in weeks Mean (SD)	36.1 (0.89)	38.5 (1.5)	< 0.001
Birth weight in grams Mean (SD)	2228 (620)	3125 (450)	< 0.001
Mode of delivery LSCS n (%)	41 (54)	35 (46)	0.36
Vaginal n (%)	30 (39)	40 (53)	0.08
Outlet forceps n (%)	5 (6)	1 (1)	0.09

Table 1: Comparison of baseline variables

On comparing the two groups, late preterm infants were significantly at a higher risk of hypothermia, hypoglycemia, sepsis and respiratory distress. There was no significant difference in mortality between the groups albeit a trend towards higher mortality was observed (Table 2).

Variable Present	Late Preterm n=76 n(%)	Term n=76 n (%)	Ocvdds Ratio (CI)	P-value
Hypothermia	65 (85%)	47 (61%)	4.4 (1.9-10.2)	0.005
Sepsis	35 (46%)	20 (26%)	2.39 (1.2-4.7)	0.01
Respiratory morbidity	36 (47%)	18 (24%)	2.9 (1.4-5.8)	0.02
Jaundice	41 (54%)	22 (29%)	2.87 (1.4-5.6)	0.02
Hypoglycemia	15 (19.7%)	2 (2.6%)	9.09 (2.0-41.3)	0.004
Birth asphyxia	17 (22%)	40 (52%)	0.25 (0.12-0.52)	0.002
Mortality	21 (27%)	18 (23%)	1.2 (0.59-2.5)	0.57

Table 2: Comparison of morbidities and mortality patterns of late preterm infants

DISCUSSION

In this study, late preterm infants were at higher risk of morbidity when compared to term infants. Hypothermia was the leading cause of morbidity in late preterm infants (85%). Even term infants were also hypothermic. Poor thermal care during transport is foremost reason for such a high incidence of hypothermia. Hypothermia tends to compound other morbidities and is independent risk factor for mortality.

Late preterm were also at a higher risk of other morbidities like hypoglycemia, sepsis and respiratory distress. Similar findings were echoed in a prospective cohort study by Jaiswal, et al. and Young PC, et al.^(5,8) where 70% of late preterm suffered from at least one neonatal morbidity. Compared with term infants, late preterm infants were at 5.5 times higher risk for overall morbidity due to any cause, 7.5 times higher risk for respiratory morbidity, 4.2 times higher risk for ventilation (Non-invasive or invasive), 3.4 times higher risk for jaundice and 4.5 times and 2.2 times higher risk for hypoglycemia and probable sepsis, respectively. Tomashek, et al.⁽⁹⁾ found that late preterm infants were 1.5 times more likely to require hospital-related care and 1.8 times more likely to be readmitted than term infants, who were breastfed. In another study,⁽¹⁰⁾ late preterm infants were 7 times more likely to have newborn morbidity than term infants (22% vs. 3%). The newborn morbidity rate doubled in infants for each gestational week earlier than 38 weeks. A retrospective study by Wang, et al.⁽¹¹⁾ showed 77.8% near term infants compared with 45.3% of term infants had at least one clinical problem and nearly all clinical outcomes differed significantly between near terms and full term neonates, viz., temperature instability, hypoglycemia, respiratory distress, jaundice.

No significant difference in mortality in late preterm infants and term infants was observed, albeit a trend towards higher mortality was observed. The relatively high mortality rate may be due to late referral, which is common scenario in government tertiary centers. The higher prevalence of hypothermia could also contribute to higher mortality. Proper thermal care from the point of referral and during transport

will help infants to remain warm and arrive at the tertiary center in a warm state. This can reduce the morbidity burden as well as significantly reduce mortality.

The limitations of our study include small sample size, absence of followup data, especially to look at the readmission rates in the late preterm group.

Thus infants born late preterm are at a higher risk of morbidities, hypothermia being the dominant morbidity.

What is already known?

Late preterm infants are physiologically less mature than term infants.

What this study adds?

In comparison with term, late preterm infants are at higher risk for neonatal morbidities, especially hypothermia, jaundice, sepsis, respiratory problems with no significant difference in mortality pattern.

Contributors

AS and BB designed the study, BS collected the data and analysed the data. All authors contributed to the manuscript and approved the final manuscript.

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