Journal Of Medical Science And Clinical Research
IGM Publication   An Official Publication Of IGM Publication

Neonatal Outcome of Late Preterm Infants Delivered in a Tertiary Care Hospital

Authors
Shruti Dhale[1], Dr Ayushi Singh[2], Dr Kuldip Shimpi[3], Dr Rasika Hattewar[4], Dr Mohammad Kashif Ali[5]
[1]Associate Professor, Department of Pediatrics
[2]Post MD Senior Resident, Department Of Pediatrics
[3]Junior Resident 2, Department of Pediatrics
[4]Junior Resident 3, Department of Pediatrics
[5]Junior Resident 2, Department of Pediatrics

Abstract
Introduction: *Infant born beforen37 weeks of gestation known as Preterm. Previously called Near term I.e infant born in gestation week 34 to 37 week known as Late Preterm .Preterm are more prone for increased morbidity and mortality as compared to Term. It is also associated with hospital readmission in 1st year of life. The available literature in late preterm is limited and need to conduct study to know the outcome of late preterm in tertiary care hospital with respect to morbidity and mortality in late preterm.*
Methodology: *It is a single centric ,observational, prospective, descriptive study conducted at tertiary care hospital on Late Preterm admitted in NICU ,Duration of study is 18 month with 195 patient were included.*
Inclusion Criteria: *1.Late Preterm(34 to 37 week)*
2.Large for Gestational age and Appropriate for Gestational age
Exclusion Criteria: *1.Late Preterm with Small for Gestational age*
2.Outborn delivery
3.Congenital Anomalies
Patient who were willing to participate and sign the informed consent were enrolled in study. Gestational age was assessed by Modified New Ballard Score.
Result: *In total study population 69.7% kept with mother and 30.3% need NICU admission. Higher percentage of neonates with NBS score 34 week require NICU admission as compared to 36 weeks. (P<0.007).Most common indication of admission is Hyperbilirubinemia followed by HIE followed by TTN. Preterm with morbidity noted in only 2.6 % most probably with Neonatal seizure .Mortality is 1%.*
Conclusion: *In studied population of gestational age 34 to 37 weeks have higher magnitude of morbidities and mortality as compared to term neonates with increase in magnitude of severity as gestational age decreased.*
Keywords: *Late Preterm, Modified New Ballard Score, Near Term.*

Introduction

Preterm or premature babies are significant public health problem across the world. WHO defines preterm as Infants born before 37 week of gestation. The percentage of death in children < 5 years of age is more in the neonatal period of which many deaths are attributable to Preterm Births. According to National institute of child health and human development workshop in 2005, late preterm infants are infants born in gestational weeks $34^{th0/7}$ and $36^{th6/7.}$ Late preterm infants were known as near term infants earlier[1,2]. The last 25 years have showed that the birth rate of late preterm infants have raised by 33%, and this is because of its well defined gestational age [3]. In India, the incidence of late preterm birth was highlighted in study conducted in south India, where out of 13.5% preterm births 55% were late preterm[4]. According to another hypothesis, advancement in the obstetric practice had led to early detection of infants with intrauterine growth retardation, fetal abnormalities and hence can be delivered earlier[5-9]. These late preterm newborns are considered to be physiologically and metabolically "functionally mature" due their same size and weight at birth as newborns born at term. Therefore, late preterm birth has increased risk of neonatal mortality and morbidity such as Respiratory distress syndrome(RDS), apnea, jaundice and hyperbilirubinemia, hypoglycemia, feeding difficulties, hypothermia and temperature instability, high risk for infection and sepsis, seizures, anemia, intraventricular hemorrhage (IVH), and necrotizing enterocolititis [1,5]. Late preterm birth has defined as an infant born between 34 0/7 weeks and 36 6/7 weeks of gestation[10-12]. It was seen that PIH was the most commonly associated maternal illness which led to preterm delivery.

Material and Methods

In the present study entitled,
Neonatal outcome of late preterm infants delivered in a tertiary care hospital, we applied following methodology.

Study Design: This was a single centric, observational, prospective, descriptive study.
Study Site: The study was conducted in department of pediatrics of a tertiary care, teaching hospital.

Study duration: The study was conducted for a period of 18 month from January 2018 to June 2019.
Study population: Late preterm born neonates who fulfill d the inclusion and exclusion criteria
Sample size: 195 late preterm neonates admitted in our tertiary care hospital were be enrolled in the study.

The sample size was calculated as follow:
Population size (for finite population correction factor or fpc) (N):
Hypothesized % frequency of outcome factor In the population (p):
8%±4 Confidence limits as % of 100 (absolute±%) (d):
Design effect (for cluster surveys-DEFF):
With confidence level of 95%, the sample size calculated was 177

With 95% CI, it comes to 177, considering 10% non-response rate, It becomes (177+18= 195)
Sample size n = $[DEFF*Np(1-p)]/[(d2/Z21-\alpha/2*(N-1)+p*(1-p)]$

Inclusion Criteria

1. Late preterms (born between 340/7 to 366/7 weeks of gestational age)
2. Appropriate for gestational age (AGA) & Large for gestational age (LGA) neonates. Hospital delivery only.
3. Mothers willing to participate in the study.

Exclusion Criteria

1. Late preterm with small for gestational age (SGA).
2. Out born delivery
3. Congenital anomalies
4. Mothers unwilling to participate in the study.

Statistical Analysis

Data was recorded in a predesigned proforma and compiled in Microsoft excel version 2015 and analysed. Descriptive statistics for quantitative variables was represented as mean +/- SD. Qualitative variables was represented as frequency & percentages. Fisher test or Chi-square test was used to test the association of columns and rows in tabular data, in case of qualitative, categorical data. Unpaired t test or Mann Whitney test was used to compare differences between two independent groups depending on the normality of distribution. Graphical representations were done wherever applicable. Level of significance was considered as P ≤ 0.05. Software used for analysis was Graph pad prism.

Results and Observation

In this study 195 late per term neonates were evaluated for clinical outcome Total number live births in the hospital during the study period was 4165, the incidence of late preterm in the tertiary care centre was found to be 13.6% (total number of late preterms delivered in the study period were 567 of which 177 required NICU admission) and incidence of late preterm who required NICU admission in tertiary care centre was 31.2% and in our study group incidence of late preterm requiring NICU care was 30.3%(59).The result of our study is as follows.

The average hospital day stay was 10.30±8.87 days among all neonates. Significant difference was in the hospital stay of neonates with NBS score 34(13.47±8.40 days) and those with NBS score 36 (8.60±8.74 days). Our study showed 195 late preterm neonates were enrolled of which males were found to be 106 (54.36%) and females were 89 (45.64%) with male to female ratio as 1.19:1.

(a) Weight wise distribution

	No of neonates (n=195)	Percentage (%)
2500 to 4000	61	31.28
200 0to 2499	132	67.7
1499 to 2000	2	1.02
<1500	0	0
Average weigh t(grams)	**2282±491.2**	

(b) Gestational age and birth weight

Gestational age and Birth weight	No of neonates (n=195)	Percentage %
AGA	182	93.33
LGA	13	6.67

(c) Gestational age on NBS score

NBS score	No of neonates	Percentage (%)
34	42	21.54
36	153	78.46
Total	195	100

(d) APGAR score among enrolled late preterm

Gestational age(NBS)	APGAR score		
	0min	**1min**	**5min**
34wk	**7.23±0.43**	**9**	**10**
36wk	**6.86±1.14**	**8.70±1.06**	**9.86±0.6**
Pvalue	0.18	-	-

(e) Status at birth

Status	NBS score34	NBS score36	No. of neonate	Percentage (%)
With Mother	22(52.4%)	114(74.5%)	136	69.7
NICU	20(47.6%)	39(25.5%)	59	30.6

(f) Discharge or outcome of late preterm

Discharge	No. of late preterms (n=195)		Total	Percentage %	P value (Fisher test)
	34wk	**36wk**			
Without morbidity	40	148	188	96.4	0.64
With Morbidity	1	4	5	2.6	1.00
Death	1	1	2	1	0.38

Discussion

WHO defines Preterm as Infants born before 37 weeks of gestation. In several others study it is found that babies born at 34 to 36 weeks the magnitude of morbidities and mortality in these subset of babies is much higher compared to term neonates. It is similar in our study as well. These were attributable to prematurity and associated morbidities. Significantly higher percentage of neonate with NBS score of 34wk required NICU admission (p<0.007). This shows that late preterm are at risk compared to term babies. Hence may require early intervention and NICU admission and neonatal care.

Conclusion and Recommendation

We can conclude that the late preterm have higher morbidities and mortality than term neonates and in postnatal period may require NICU admission. Late preterms form a special group of neonates who require more care and attention after delivery as compared to term neonates. Late preterms have more tendency to develop medical complications as compared to term neonates which lead to increase in morbidity and mortality. Late preterms discharged with morbidity were few (2.6%) i.e. amongst which, most common morbidity was neonatal seizure Hyperbilirubinemia was the most common indication for NICU admission.

Hence in an era of technological advancement, in order to decrease infant mortality rate which is regarded as significant parameter for development of country, we need to decrease preterm mortality which also includes late preterm death. The goals will include screening and scrutinizing from the antenatal period to the postnatal period. Educating mothers regarding regular ANC visits, timely screening and close monitoring of high risk pregnancy, close monitoring of late preterm babies, equipped NICU facilities with experienced staff and doctors, delay in early discharge from hospital, educating mothers regarding special care and feeding practices for late preterm babies and frequent follow up after discharge are important steps required for decreasing perinatal mortality rate in India.

References

1. Zeitlin J, Szamotulska K, Drewniak N, Mohangoo A, Chalmers J, Sakkeus Letal. Preterm birth time trends in Europe: a study of 19 countries. BJOG: An International Journal of Obstetrics & Gynaecology. 2013;120(11):1356-1365.

2. Preterm Birth. Maternal and Infant Health. Reproductive Health. CDC. Cdc.gov.2016. Available from: http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.html.Cited on13thDecember2019.

3. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Mathews TJ, Osterman MJ. Births: final data for 2008. Natl Vital Stat Rep.2010;59(1):1,3-71.

4. Femitha P, Bhat BV. Early neonatal outcome in late preterms. Indian J Pediatr. 2012;79(8): 1019-24.

5. Davidoff MJ, Dias T, Damus K. Changes in the gestational age distribution among. U.S. single ton births: impact on rates of late preterm birth, 1992–2002. Semin Perinatol.2006;30:313.

6. Hankins GD, Longo M. The role of stillbirth prevention and late preterm (nearterm) births. Semin Perinatol. 2006; 30:20–23.

7. Sibai BM. Pre-eclampsiaasa cause of preterm and late preterm (near-term) births. Semin Perinatol. 2006;30:16–19.

8. Moutquin JM. Classification and heterogeneity of preterm birth. BJOG. 2003;110:30–33

9. Linhart Y, Bashiri A, Maymon E. Congenital anomalies are an independent risk factor for neonatal morbidity and perinatal mortality in preterm birth. Eur J Obstet Gynaecol Reprod Biol. 2000;90: 43–49.

10. Raju T. Epidemiology of late preterm (near-term births. Clin Perinatol 2006; 33(4):751-63.

11. Raju T, Higgins R, Stark A, Leveno K. Optimizing care and outcome for late-preterm (nearterm) infants: A summary of the workshop sponsored by the National Institute of Child Health and Human Development. Pediatrics 2006;118 (3):1207-14.

12. Engle W. A recommendation for the definition of "late preterm" (near-term) and the birth weight-gestational age classification system. Semin Perinatol 2006;30(1):2-7.