

Early Neonatal Morbidities in Late Preterm Neonates

Nasir Khan¹, Khyal Muhammad², Fiaz Ahmed³, Zaheer Abbas², Rifayat Ullah Afridi⁴ and Ejaz Hussain²

ABSTRACT

Objective: To determine the distribution of early neonatal morbidities in late preterm infants.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the department of Pediatrics and Neonatology Ayub teaching hospital, Abbottabad from May 2018 to December 2019.

Materials and Methods: After taking approval from ethical committee, data was collected from all neonates admitted to department of neonatology, who were born late preterm with gestation of less than 37 weeks but with 34 completed weeks. Total 147 neonates were included in this study. In all neonates who were included in this study, morbidities were evaluated from birth till 7th day of life through clinical examination and relevant investigations and were recorded on proforma.

Results: Mean neonatal age was 4 days with SD \pm 3.74. Fifty-six percent neonates were male and 44% neonates were female. More over 25% neonates had hyperbilirubinemia, 28% neonates had sepsis, 20% neonates had intrauterine growth restriction, 4% neonates had transient tachypnea of newborn, 15% neonates had hypoglycemia, 16% neonates had respiratory distress syndromes and 13% neonates had apnea.

Conclusion: Our study concludes neonatal morbidities like hyperbilirubinemia, sepsis, intrauterine growth restriction, transient tachypnea of newborn; hypoglycemia, respiratory distress syndromes, and apnea are associated with late preterm births.

Key Words: Early neonatal morbidities, late preterm, infants

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INTRODUCTION

Preterm delivery is one of the most significant cause of neonatal morbidity and mortality.¹ Globally preterm deliveries are occurring due to various medical and obstetrical conditions mostly occurring in the late preterm period that results in morbidities of the newborn.² Late preterm neonates, born with period of gestation less than 37 weeks but 34 completed weeks are considered normal newborns and are kept in well-infant nursery units under the similar protocols as that of the term infants and sent home before sufficient observational period.^{3,4} Late preterm babies are not physiologically as full-grown as term babies so should not be considered functionally term in any aspect.⁵

Late preterm infants are at high threat of morbidity and endangered outcome.⁶ These babies are at notably high short and long term unfavorable outcomes compare to term babies with a list of neonatal problems documented in literature.² Some of these problems include feeding difficulties, hypoglycemia, respiratory distress syndromes (RDS), intrauterine growth retardation, sepsis, apnea, jaundice (hyperbilirubinemia) and transient tachypnea of the newborn.⁷⁻¹⁰ In a study in Pakistan by Haroon et al.¹¹ the Respiratory distress syndrome was documented as 16.5%, High level of bilirubin of 37.9%, Hypoglycemia was reported about 5.2%, Growth retardation was 24.8%, Sepsis was documented about 4.9%, Transient tachypnea of newborn was reported in 7.0%, Apnea was documented about 15.3 in a Pakistani.

As the late preterm group is associated with greater morbidity compare to term neonates so this study is undertaken to identify the early neonatal morbidities in later preterm babies. Prior awareness of the morbidities associated with late preterm bodies is helpful for the health care provides to anticipate and manage potential complications in late preterm infants. Accurate estimate of the risks of morbidities is required to enable healthcare provider to take timely measures to improve the outcome.

MATERIALS AND METHODS

After taking hospital ethics committee approval this descriptive study was conducted at Pediatric

¹. Women Medical College Abbottabad.

². Ayub Teaching Hospital Abbottabad.

³. Women & Children Hospital

⁴. Department of Pediatrics, Nasseer Teaching Hospital, Peshawar.

Correspondence: Dr. Nasir Khan, Assistant Professor Women Medical College, Abbottabad.

Contact No: 0311-5529571

Email: drnasirkhan1234@gmail.com

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Department, Ayub Teaching Hospital Abbottabad from May 2018 to December 2019. Sample size of 147 was calculated using previous study.¹¹ Sampling technique applied was Consecutive non-probability sampling. All the late preterm (34 to 36 weeks of gestation) infants of both genders and of age up to 7 days admitted to neonatology unit of Ayub Teaching Hospital, Abbottabad were included while the term infants, infants with congenital anomalies, syndromes, early preterm, multiple births and surgical conditions were excluded. Pretest counseling was given to parents. After written consent from the parents, those neonates fulfilling the above mentioned criteria were assessed for gestational age by menstrual period. In every baby who had require admission to neonates unit from birth to first 7 days of life, morbidities such as respiratory distress syndrome, hypoglycemia, sepsis, transient high respiratory rate of newborn, apnea and jaundice were evaluated. Infants were evaluated daily till 7 days of life through clinical examination or investigation for development of any of the morbidities mentioned above. Any of the predefined medical conditions resulting in post-delivery inpatient hospital observation and admission were assessed by physical examination as well as through relevant investigations. All the observations were done under supervision of an experience pediatrician.

All the above mentioned information including name, age, gender and address were recorded on a pre-designed proforma.

Data was analyzed using SPSS version 21. Quantitative variables like age, gestation (weeks), weight were described

in terms of means± standard deviation. Categorical data like gender and early neonatal morbidities (hyperbilirubinemia, sepsis, intrauterine growth restriction, transient tachypnea of newborn, hypoglycemia, respiratory distress syndrome and apnea) were described in the terms of frequency and percentages. All results were presented as tables and diagrams. Data was stratified by gender, age, gestation (weeks) & weight in term of neonatal morbidities. Post stratification chi -square test was used at 5% level of significance.

RESULTS

Table No 1. Neonatal morbidity (n= 147)

Morbidity	Frequency	Percentage
Hyperbilirubinemia	37	25%
Sepsis	41	28%
Intrauterine growth Restriction	29	20%
Transient tachypnea of Newborn	6	4%
Hypoglycemia	22	15%
Respiratory distress Syndrome	24	16%
Apnea	19	13%

Table No 2. Stratification of neonatal morbidity w.r.t age distribution

Morbidity	Status	1-4 days	4-7 days	Total	P value
Hyperbilirubinemia	Yes	26	11	37	0.8127
	No	75	35	110	
Total		101	46	147	
Sepsis	Yes	28	13	41	0.9462
	No	73	33	106	
Total		101	46	147	
Intrauterine growth restriction	Yes	20	9	29	0.9733
	No	81	37	118	
Total		101	46	147	
Transient tachypnea of newborn	Yes	4	2	6	0.9123
	No	97	44	141	
Total		101	46	147	
Hypoglycemia	Yes	15	7	22	0.9540
	No	86	39	125	
Total		101	46	147	
Respiratory distress syndrome	Yes	17	7	24	0.8060
	No	84	39	123	
Total		101	46	147	
Apnea	Yes	13	6	19	0.9770
	No	88	40	128	
Total		101	46	147	

Table No. 3: Stratification of neonatal morbidity w.r.t. gender distribution

Morbidity	Status	Male	Female	Total	P value
Hyperbilirubinemia	Yes	21	16	37	0.8903
	No	61	49	110	
Total		82	65	147	
Sepsis	Yes	23	18	41	0.9618
	No	59	47	106	
Total		82	65	147	
Intrauterine growth restriction	Yes	16	13	29	0.9412
	No	66	52	118	
Total		82	65	147	
Transient tachypnea of newborn	Yes	3	3	6	0.7709
	No	79	62	141	
Total		82	65	147	
Hypoglycemia	Yes	12	10	22	0.8992
	No	70	55	125	
Total		82	65	147	
Respiratory distress syndrome	Yes	13	11	24	0.8617
	No	69	54	123	
Total		82	65	147	
Apnea	Yes	11	8	19	0.8425
	No	71	57	128	
Total		82	65	147	

In this study age distribution among 147 neonates was analyzed as 101(69%) neonates were in age range 1-4 days, 46(31%) neonates were in age range 4-7 days. Mean age was 4 days with SD ± 3.74 Gender distribution among 147 neonates was analyzed as 82(56%) neonates were male and 65(44%) neonates were female. Gestational weeks among 147 neonates were analyzed as 56(38%) neonates had 35 weeks of gestation while 91(62%) neonates had 36 weeks of

gestation. Mean Gestational weeks was 36 weeks with SD ± 2.341 Weight distribution among 147 neonates was analyzed as 26(18%) neonates had weight <1.5 kg while 106(72%) neonates had weight range 1.5-2.5 Kg. Mean weight was 1.7 kg with SD ± 1.116.

Table No. 4: Stratification of neonatal morbidity w.r.t gestational week

Morbidity	Status	35 weeks	36 weeks	Total	P value
Hyperbilirubinemia	Yes	14	23	37	0.9703
	No	42	68	110	
Total		56	91	147	
Sepsis	Yes	16	25	41	0.8853
	No	40	66	106	
Total		56	91	147	
Intrauterine growth restriction	Yes	11	18	29	0.9838
	No	45	73	118	
Total		56	91	147	
Transient tachypnea of newborn	Yes	2	4	6	0.8063
	No	54	87	141	
Total		56	91	147	
Hypoglycemia	Yes	8	14	22	0.8561
	No	48	77	125	
Total		56	91	147	
Respiratory distress syndrome	Yes	9	15	24	0.9477
	No	47	76	123	
Total		56	91	147	
Apnea	Yes	7	12	19	0.9041
	No	49	79	128	
Total		56	91	147	

Table No. 5. Stratification of neonatal morbidity w.r.t weight

Morbidity	Status	35 weeks	36 weeks	Total	P value
Hyperbilirubinemia	Yes	14	23	37	0.9703
	No	42	68	110	
Total		56	91	147	
Sepsis	Yes	16	25	41	0.8853
	No	40	66	106	
Total		56	91	147	
Intrauterine growth restriction	Yes	11	18	29	0.9838
	No	45	73	118	
Total		56	91	147	
Transient tachypnea of newborn	Yes	2	4	6	0.8063
	No	54	87	141	
Total		56	91	147	
Hypoglycemia	Yes	8	14	22	0.8561
	No	48	77	125	
Total		56	91	147	
Respiratory distress syndrome	Yes	9	15	24	0.9477
	No	47	76	123	
Total		56	91	147	
Apnea	Yes	7	12	19	0.9041
	No	49	79	128	
Total		56	91	147	

Neonatal morbidity among 147 neonates was analyzed as 37(25%) neonates had hyperbilirubinemia, 41(28%) neonates had sepsis, 29(20%) neonates had intrauterine growth restriction, 6(4%) neonates had transient tachypnea of newborn, 22(15%) neonates had hypoglycemia, and 24 (16%) neonates had respiratory distress syndromes while 19 (13%) neonates had Apnea. (Table 1).

DISCUSSION

There has been a concomitant rise in the rate of morbidities among newborn delivered as preterm gestation.⁶

Our study showed that among 147 neonates 69% neonates were in age range 1-4 days, 31% neonates were in age range 4-7 days. Mean neonatal age was 4 days with SD±3.74. Fifty six percent neonates were male and 44% neonates were female. Thirty eight percent neonates had 35 weeks of gestation while 62% neonates had 36 weeks of gestation. Mean Gestational weeks was 36 weeks with SD ± 2.341. Eighteen percent neonates had weight <1.5 kg while 106(72%) neonates had weight range 1.5-2.5 Kg. Mean weight was 1.7 kg with SD ± 1.116. More over 25% neonates had hyperbilirubinemia, 28% neonates had sepsis, 20% neonates had intrauterine growth restriction, 4% neonates had transient tachypnea of newborn, 15% neonates had hypoglycemia, and 16% neonates had respiratory distress syndromes while 13% neonates had Apnea.

Similar results were observed in a study conducted by Haroon A et al¹¹ in which Respiratory distress syndrome in

16.5%, Growth retardation in 24.8%, high level of bilirubin in 37.9%, sepsis was 4.9%, hypoglycemia in 5.2%, transient high respiratory rate in 7.0% and apnea in 15.3%.

In another study conducted by Femitha P et al¹² in which respiratory distress syndrome was 12.4%, hyperbilirubinemia was 28.7%, sepsis was 20.8%, and Hypoglycemia was 5.2%. while in a study at Brazil¹³ the growth retardation was 26.1%, transient tachypnoea was 25.9% and apnoea was 6.3% while 30% sepsis, hypoglycemia in 10.3% and feeding difficulty in 15.8% late preterm neonates were recorded in Jordan.¹⁴

Tiwari et al¹⁵ reported that among late preterm 13.06% developed respiratory distress 52.56% late preterm had jaundice, 10.99% episodes of hypoglycemia, Hypothermia occurred in 7.94% late preterm neonates, 4.24% late preterm experienced one or more episodes of apnea. 18.06% late preterm babies had feeding problems, 9.79% term babies had confirmed sepsis.

In a study conducted by Binarbasi P et al¹⁶, hypothermia was noted in 14.5% of late preterm neonates and feeding difficulty in 19.1% in late preterm. Ligginc GC et al¹⁷ observed that incidence of

apnea in 6% late preterm babies. In another study¹⁸ the incidence of sepsis in late preterm was 10.3%.

This variation may be due to climatic condition of study places, difference in cut off temperature for consideration of hypothermia or differences in timing of study.

CONCLUSION

Our study concludes that the frequency of early neonatal morbidities like hyperbilirubinemia, sepsis, intrauterine growth restriction, transient tachypnea of newborn, hypoglycemia, respiratory distress syndromes, apnea are associated in late preterm infants. Prior awareness of the morbidities associated with late preterm babies is helpful for the health care providers to anticipate and manage potential complications in late preterm infants. Accurate estimate of the risks of morbidities is required to enable healthcare provider to take timely measures to improve the outcome.

Author's Contribution:

Concept & Design of Study: Nasir Khan
 Drafting: Khyal Muhammad, Fiaz Ahmed
 Data Analysis: Zaheer Abbas, Rifayat Ullah Afridi, Ejaz Hussain
 Revisiting Critically: Nasir Khan, Khyal Muhammad
 Final Approval of version: Nasir Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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