RESEARCH ARTICLE

A descriptive study of frequency of short term complications in late preterm neonates at a tertiary care hospital Rawalpindi

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Abstract

Objective: To determine the frequency of short-term complications in late preterm neonates in a tertiary care setting.

Method: The observational study was conducted at Benazir Bhutto Hospital, Rawalpindi, Pakistan, from December 1, 2020, to May 31, 2021, and comprised late preterm neonates. Frequency of complications were noted in the subjects. Data was analysed using SPSS 22.

Results: Of the 200 subjects, 108(54%) were males, 84(42%) were aged 34-35 weeks. Among the complications, sepsis was the most frequent 88(44%), followed by respiratory distress syndrome RDS 58(29%). Mean weight was 2±0.42 kg and mean day of life at presentation was 2±1.9. Most common maternal risk factor was premature rupture of membrane 48(24%).

Conclusion: Late preterm neonates had critical complications. The health authorities should formulate policies in this regard.

Keywords: Late preterm, Short-term complications, RDS, Neonatal sepsis. (JPMA 72: 1775; 2022)

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Introduction

The World Health Organisation (WHO) estimated the worldwide preterm birth rate to be about 11% of total births. South-eastern Asia, South Asia, and sub-Saharan Africa report the maximum preterm births in the developing world,[1] while 73% of them are late preterm births.[2] In Pakistan, the prevalence of prematurity is approximately 18.89%.[2] Preterm birth is a public health, social and economic problem, and is considered the most frequent cause of neonatal death globally.[3]

Although late preterm constitutes the main percentage of preterm births in secondary and tertiary care hospitals, they were usually not considered liable for preterm complications since they are very similar physiologically and metabolically to the term neonates and are kept in Level 1 nurseries around the world.[2]

Late preterm infants have an increased risk of short-term complications like, respiratory complications, neonatal jaundice (NNJ), infections, feeding problems, necrotising enterocolitis (NEC), hypothermia and hypoglycaemia.[2,4-6] It is also associated with long-term complications, like neurodevelopmental morbidity and sensorineural impairments.[3] Neonatal, infant and adulthood mortalities are also significantly higher in late preterm cases than in term infants.[2,7-9]

The most common risk factors of late preterm births are pregnancy complications, like pregnancy-induced hypertension (PIH) and idiopathic hypertension (HTN), gestational diabetes mellitus (GDM), doctor-initiated delivery due to some maternal or foetal complication which can endanger foetal life if the pregnancy proceeded further, assisted reproduction, maternal individual factors, lifestyle attribution and environmental factors.[10]

Neonatologists and paediatricians should be fully cognizant of the current and ongoing complications infants can suffer after being born late preterm.

The current study was planned to determine the frequency of short-term complications of late preterm neonates in a tertiary care setting.

Subjects and Methods

The descriptive, observational study was conducted at the Paediatric Department of Benazir Bhutto Hospital, Rawalpindi, Pakistan, from December 1, 2020, to May 31, 2021. After taking approval from the institutional ethics review committee.

The sample size was calculated using the WHO calculator[11] with estimated population 12.7%,[2] precision level 5% and confidence interval (CI) 95%.

The sample was raised using non-probability consecutive sampling technique from among the patients presenting to the hospital's nursery through emergency or received directly from the gynaecology department. Those included were neonates of gestational age from 34 weeks to <36 weeks admitted to the neonatal intensive care unit (NICU).

Those excluded were neonates having congenital

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anomalies, those with inborn error of metabolism, and patients who did not have first trimester ultrasound available for gestational age calculation.

Data was collected after taking informed written consent from the parents or caretakers. Patient profile, including name, age, gender, address, hospital number, date of inclusion in the study and any complication developed in the first seven days, was noted using a predesigned proforma. All investigations done at the hospital pathology department, the diagnosis of late preterm and any complication seen was classified as per operational definition. Late preterm neonate was defined as gestational age between 34 weeks and 36^{+6} weeks,[2] calculated on the basis of 1st trimester ultrasound; short-term complications were complications noted within 7 days of life; hypothermia was body temperature <35.5 degrees Celsius; respiratory distress syndrome (RDS) was neonates having abnormal respiratory rate, nasal flaring, lower chest indrawing, or chest X-ray (CXR) showing signs of RDS;[10] necrotising enterocolitis was having clinical signs and symptoms of abdominal distension, not tolerating feed, disseminated intra-vascular coagulopathy (DIC) and/or ultrasonographic findings; sepsis was clinically diagnosed and confirmed or supported by laboratory evidence; hyperbilirubinaemia was bilirubin >3mg/dl;[12] hypoglycaemia was blood random sugar level <55mg/dl after first 4 hours of life.[13]

Data was analysed using SPSS 22. Qualitative data was expressed as frequencies and percentages, while quantitative variables were presented as mean and standard deviation. The relation of complications with gestational age and birth weight was evaluated using chi-square test. P<0.05 was taken as statistically significant.

Results

Of the 200 subjects, 108(54%) were males, 84(42%) were aged 34-35 weeks (Table-1; Figure-1). Of the total, 79(39.5%) neonates were born in the study hospital and 121(60.5%) were referred from emergency. Among the complications, sepsis was the most frequent 88(44%), followed by RDS 58(29%) (Table-2). Among other complications, congenital heart disease (CHD) was noted in 131(65.5%) neonates (Table-3).

Table-1: Breakdown of gestational ages.

Gestational age (week)	**n (%)**
Valid	
34-<35	84 (42.0)
35-<36	58 (29.0)
36-<37	58 (29.0)
Total	200 (100)

Mean weight was 2±0.42 Kg and mean day of life at presentation was day 2±1.9 (Table-4). The most common maternal risk factor was premature rupture of membrane (PROM) 48(24%) (Figure-2).

Significant relationship of gestational age was found with sepsis (p=0.007), RDS (p=0.02), NNJ (p=0.01) and NEC (p=0.007). No significant relationship was found between

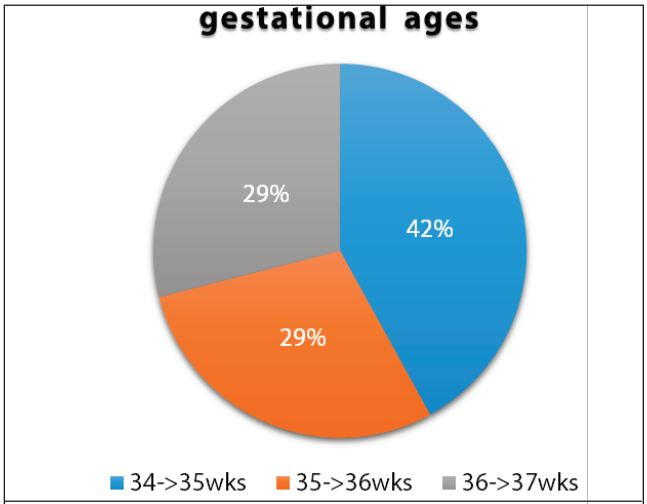

Figure-1: Breakdown of gestational ages

Table-2: Frequency of different complications noted.

Complication	**n (%)**
Sepsis	88 (44)
Respiratory distress syndrome (RDS)	58 (29)
Neonatal jaundice	38 (19)
Feeding problems	18 (9)
Hypothermia	10 (5)
Necrotising enterocolitis	4 (2)
Hypoglycaemia	4 (2)

Table-3: Associated complications noted.

Complication	**n (%)**
None	131 (65.5)
Congenital heart disease	9 (4.5)
Birth asphyxia	26 (13.0)
Death	10 (5.0)
Twin gestation	20 (10.0)
DIC	2 (1.0)
AKI	2 (1.0)
Total	200 (100)

DIC: dissiminated intravascular coagulation, AKI: acute kidney injury.

Table-4: Mean days of life at presentation and birth weight.

	n	**Minimum**	**Maximum**	**Mean±SD**
Day of life	200	.00	7.00	2.0900±1.98535
Weight	200	1.20	3.80	2.0115±0.42452

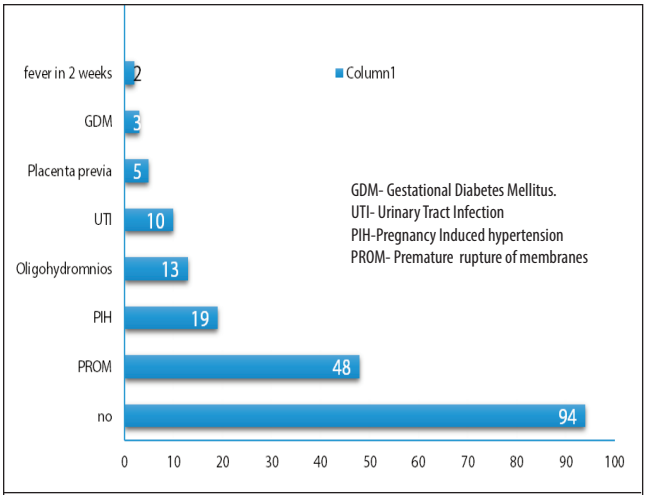

Figure-2: Frequency of maternal risk factors.

gestational age and hypothermia (p=0.08), hypoglycaemia (p=0.4) and feeding problem (p=0.07). Similarly, significant relation of birth weight was found with RDS (p=0.03), hypothermia (p=0.04), NNJ (p=0.00001), feeding problem (p=0.00001) and NEC (p=0.02). No significant relation of birth weight was found with hypoglycaemia (p=0.19) and sepsis (p=0.2).

Discussion

Statistics on late preterm neonates in the developing countries are usually deduced from the available data elsewhere owing to lack of accurate local data.[1]

Late preterm neonates are at greater risk of preterm complications. They are more prone to develop hypoglycaemia, hypothermia, RDS, transient tachypnoea of the newborn, apnoea of prematurity, exaggerated physiological jaundice, NEC and feeding difficulties after the birth.[14-17]

The current study assessed and monitored late preterm neonates from birth hospitalisation up to 7 days to record the rate of short-term complications, and results manifested the frequency of RDS 29%. Khowaja et al. stated that respiratory morbidities were diagnosed in 23.5%[2] subjects and that the risk decreased with gestational age. Shaikh et al. reported RDS in 35% of late preterm neonates.[18] In the current study, there was significant relationship of RDS with gestational age (p=0.02) and birth weight (p=0.03).

Another complication noted in the current study (5%) was hypothermia, which had no significant relation with gestational age (p=0.08) and birth weight (p=0.04). Other studies reported 10% and 6%[2] cases of hypothermia that needed active management.

Late preterm neonates are more likely to develop hyperbilirubinaemia, its delayed resolution and central nervous system (CNS) complications because of the imbalance of bilirubin production and excretion due to hepatic immaturity.[19,20] In the current study, 19% subjects developed NNJ, which is comparable to 17.5%[1] and 14%[15] such subjects requiring phototherapy.

Increased need of glucose for brain as well as decreased ability of gluconeogenesis can lead to hypoglycaemia in preterm neonates, and poor feeding ability adds to the risk.[21] In the current study, 2% subjects developed hypoglycaemia. Studies reported hypoglycaemia in 16%,[19] 13.8%[1] and 3%[6] of late preterm neonates. The low frequency in the current study was because all the subjects were being managed with intravenous (IV) dextrose in the initial hours of life.

Intestinal microbial environment affects the immunological maturity in late preterm neonates and delay in intestinal colonisation process make these newborns more prone to infection. In the current study, 44% subjects developed sepsis compared to 2%,[19] 9.2%[2] and 0.7%[6] reported earlier. The difference can be due to overcrowding of neonates and relative absence of aseptic techniques due to lack of manpower and training in the current study's site.

Late preterm neonates can experience poor growth due to their inability to breastfeed adequately because of weak suction pressure or inadequate milk supply because of delayed lactogenesis. Late preterm infants may take "considerably longer to feed normally" because gastrointestinal motility and gastric emptying may be delayed.[22] In the current study, feeding problems were noted in 9% subjects and NEC in 2%.

In the current study, the main maternal complication that led to late preterm birth was PROM in 24%. in one study, 29% of spontaneous late preterm deliveries had PROM.[22]

The limitations of the current study include a short 6-month duration, and its focus on a limited number of complications. Long-term complications were not noted.

Conclusions

Late-preterm neonates are at higher risk of neonatal morbidity, especially in the first 7 days of life when there fragile body is adapting to extrauterine life. They need to be taken care of and monitored in this crucial phase of life. Health authorities should formulate policies that may help avoid late preterm morbidities.

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Conflict of Interest: None.

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