



## **Frequency of Complications in Neonates with Low Birth Weight**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author KAS conceived, designed and collected data for the study. Authors FFK and HR manuscript writing and literature review. Authors KS and KR did critical review and statistical analysis. Author FKA data collection. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Objective:** To identify and determine the frequency of complications in neonates with low birth weight.

**Methodology:** This cross sectional study was conducted at Khairpur Medical College and Lady Willingdon Hospital, Khairpur Mirs from January 2018 to July 2021. Two hundred (n=200) neonates with low birth weight (<2500 grams) were recruited and frequency of different complications were observed.

**Results:** The mean age of the neonates was 10.50 ± 4.34 days. Of the 200 neonates with low birth weight, 132 neonates (66%) presented with various complications; however 68 neonates (34%) were normal and without complications. Of the 200 neonates with low birth weight, the following complications were observed, hypoglycaemia (14.5%), jaundice (12.5%), respiratory distress

syndrome (8%), feeding problems (8%), congenital cardiac defects (5%), hypothermia (4%), other complications such as sepsis (2%), apnea of prematurity (2%), intraventricular haemorrhage (2%), and more than 1 complications (16 neonates, 8%).

**Conclusions:** In conclusion, hypoglycaemia and jaundice were the common complications associated with low birth weight in neonates. Advanced maternal age during childbirth, stress, lower socioeconomic conditions, consanguineous marriages, lower body mass index and maternal illness such as preeclampsia and anaemia were the risk factors of low birth weight observed in our study. Risk factors may be identified earlier in order to lessen the morbidities and mortality in low birth weight neonates.

*Keywords: Low birth weight; complications; neonates.*

## 1. INTRODUCTION

Low birth weight is a significant criteria for finding out the neonates and infants prognosis and survival. It is the essential indicator for socioeconomic status and maternal and child's health evaluation. Babies born with birth weight of less than 2500g, regardless of gestational age are characterized as low birth weight [1]. It is estimated that every year about 20 million newborns are delivered with low birth weight and the incidence is 2 fold higher in the developing countries in contrast to developed countries. In Pakistan the incidence is approximately 16% [2]. Furthermore, incidence of congenital heart diseases among newborns has been found to be 3–12/1000 live births [3]. About 72% of low birth weight neonates are born in Asia. In Pakistan the prevalence is 12-25% [4]. Neonatal mortality is 20 times more in low birth weight infants as compared to babies weighing greater than 2.5kg [5]. Due to higher complications reported in low birth weight neonates in Pakistan, this study was carried out to identify the common complications associated with low birth weight neonates so risk factors can be identified and preventive strategies may be carried out to lower the morbidity and mortality related to it.

Low birth weight neonates are reported with various complications such as birth asphyxia, polycythemia, hypoglycemia, hypothermia, hypocalcemia, seizures, respiratory distress syndrome, apnea, feeding difficulties, jaundice, necrotizing enterocolitis, intraventricular haemorrhage, sepsis and prolonged hospitalization [2,6,7]. It has been evidenced that low birth weight has more frequency of congenital heart diseases as compared to other population [8]. In our previous study we found that congenital heart diseases were present in 12.5% of the low birth weight neonates [9].

It is also reported that low birth weight has been related to congenital heart diseases; especially ventricular septal defect (VSD), atrial septal defect (ASD) and tetralogy of Fallot (TOF), demonstrating association of birth weight with congenital heart diseases [10,11]. Infants with low birth weight and associated co-morbidities have been associated with greater risks for postoperative infection, contrary to normal birth weight babies with lesser rate of postoperative infections [12].

This study was designed with objectives to identify and determine the frequency of complications in low birth weight neonates in our population.

## 2. METHODOLOGY

This cross sectional study was conducted at Khairpur Medical College and Lady Willingdon Hospital, Khairpur Mirs from January 2018 to July 2021. For this study we selected n= 200 neonates with low birth weight (< 2500 grams) by non-probability consecutive sampling.

Inclusion criteria included neonates who had low birth weight, age < 28 days, both male and female gender. Low birth weight was defined as newborns weighing <2500 g. Neonate specified for babies from birth to 28 days were included. Exclusion criteria included babies weighing >2500 g and age >28 days. Frequency and percentages were calculated on SPSS version 20.

## 3. RESULTS

The mean age of the neonates was  $10.50 \pm 4.34$  days. There were 96 (48%) neonates of age range of 0-7 days, 50 (25%) neonates of age range of 8-14 days, 36 (18%) neonates between 15-21 days of age and 18 (9%) neonates between 22-28 days of age (Fig. 1).

Of the 200 neonates with low birth weight, 132 neonates (66%) presented with various complications; however 68 neonates (34%) were normal and without complications, in our study (Fig. 2).

Of the 200 neonates with low birth weight, the following complications were observed, hypoglycaemia (29 neonates, 14.5%), jaundice (25 neonates, 12.5%), respiratory distress syndrome (16 neonates, 8%), feeding problems (16 neonates, 8%), congenital cardiac defects (10 neonates, 5%), hypothermia (8 neonates,

4%), other complications such as sepsis (4 neonates, 2%), apnea of prematurity (4 neonates, 2%), intraventricular haemorrhage (4 neonates, 2%), and more than 1 complications (16 neonates, 8%).

Advanced maternal age during childbirth, stress, lower socioeconomic conditions, consanguineous marriages, lower body mass index and maternal illness such as preeclampsia and anaemia were the risk factors of low birth weight observed in our study.

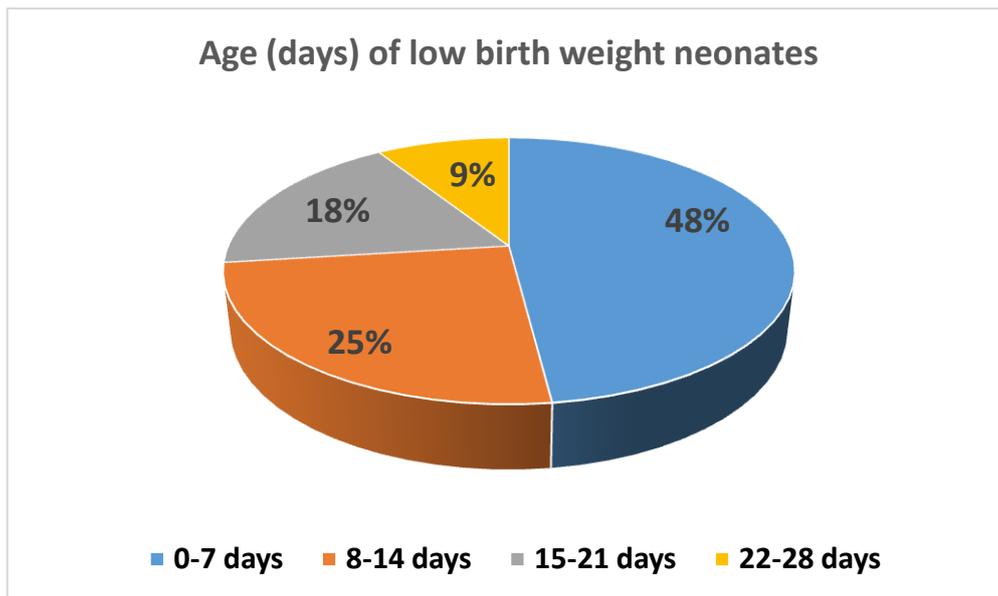


Fig. 1. Age of low birth weight neonates (n=200)

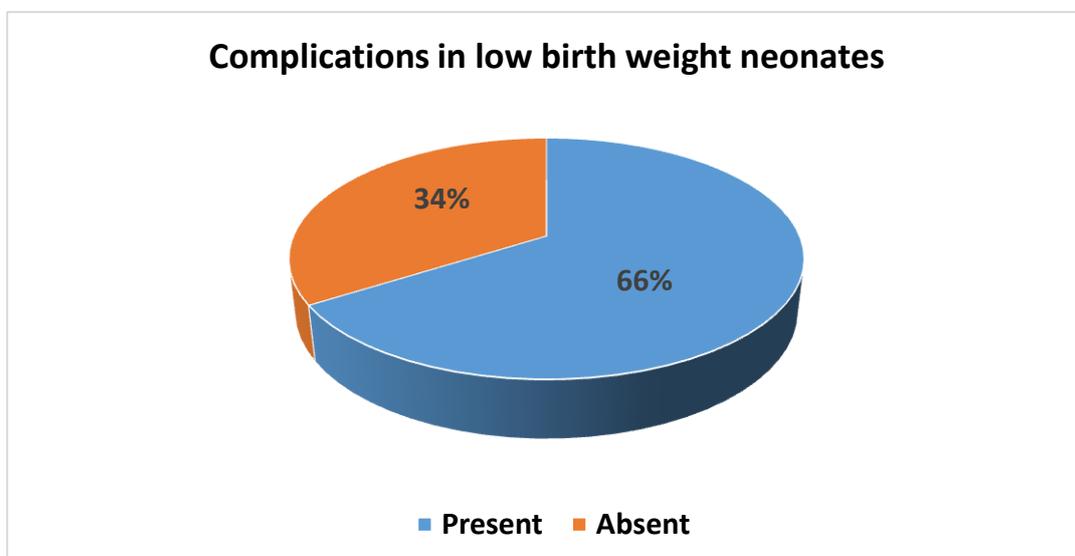
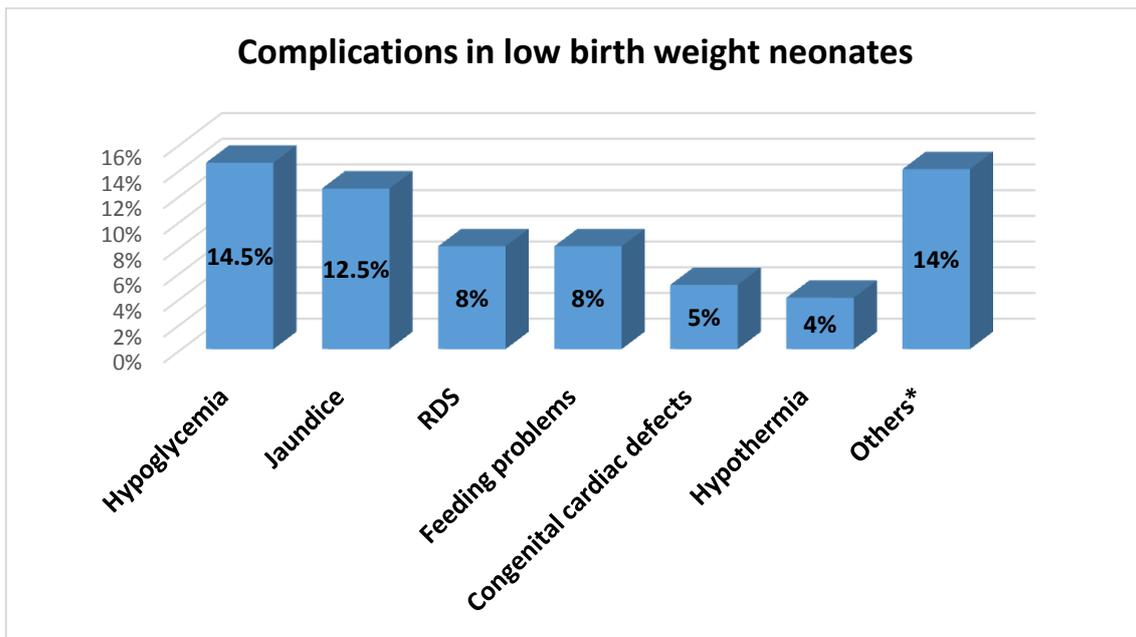


Fig. 2. Distribution of low birth weight neonates by presence or absence of complications (n=200)



**Fig. 3. Distribution of low birth weight neonates by various complications (n=200)**

\*Other complications and neonates with more than 1 complication;

RDS: Respiratory distress syndrome

#### 4. DISCUSSION

This study assessed the association of low birth weight of the neonates and various complications. We found higher frequency of complications among low birth weight neonates i.e. 66%. The incidence of morbidity and mortality in newborns with low birth weight reveals the importance of prenatal, intrapartum and postnatal care. It differs due to socioeconomic conditions, health care facilities, level of awareness, and past obstetrical history. Early morbidities found in the present study are in accordance with the findings of the study conducted by Basu et al., which observed the respiratory distress syndrome, hypoglycaemia, hypothermia, sepsis and shock as some of the common complications among low birth weight neonates [13].

In our study we found the frequency of hypoglycaemia higher as compare to other complications (14.5%). Another study found that 24% infants with low birth weight presented with hypoglycaemia [14]. According to an Indian study, 8.4% of low birth weight babies presented with hypothermia, in contrast to the present study showing hypothermia among 4% of low birth weight neonates [15].

Neonatal jaundice can occur in newborns with a low birth weight irrespective of the gestational

age, however, the risk of neonatal jaundice has been found higher in premature infants with low birth weight than in term infants with low birth weight [16]. Nurani, et al, found a significant association between low birth weight and pre-term infants with the incidence of neonatal jaundice [17] that is in the agreement to the present study.

Respiratory distress syndrome is a leading reason for respiratory failure and neonatal mortality. Evidence from previous studies show that risk factors such as male gender, low birth weight, and cesarean section may contribute the higher risk for respiratory distress syndrome [18]. Results of current investigations found that 8% of low birth weight neonates were complicated with respiratory distress syndrome. Saroop Chand FA et al., [2] observed respiratory distress syndrome in 11% and hypothermia in 2.5% of low birth weight neonates.

A study reported 760 babies weighing <1000 g and observed 47 babies with congenital heart diseases. The incidence of congenital heart disease reported in their study was low (2.3%) in comparison to our study (5%). VSD was the most commonly reported in 53.2% patients followed by coarctation of aorta (17%) [3], suggesting the screening of low birth weight neonates for congenital cardiac defects. Godfrey M, et al. [19],

found 19 infants (4.4%) with congenital cardiac disease from sample of 11,281 low birth weight neonates demonstrating higher incidence. In another study, among cohort of 105,539 very low birth weight infants (<1500 g), 299 (0.3%) showed congenital heart diseases with overall mortality of 55% [20].

Low birth weight among neonates have shown association with less maternal age, lack of antenatal care, maternal illness and maternal body mass index [21]. Further studies may be conducted to identify risk factors and manage accordingly.

## 5. CONCLUSION

In conclusion, the current study reported the major complications of low birth weight neonates in our setup. Hypoglycaemia and jaundice were the common complications in low birth weight in neonates. Advanced maternal age during childbirth, stress, lower socioeconomic conditions, consanguineous marriages, lower body mass index and maternal illness such as preeclampsia and anaemia were the risk factors of low birth weight observed in our study. Risk factors should be identified earlier in order to reduce morbidity and mortality in low birth weight in neonates.

## DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline Patient's consent and ethical approval has been collected and preserved by the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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