



Original Article

COMPLICATIONS OF LOW BIRTH WEIGHT BABIES DURING FIRST 72 HOURS OF LIFE

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ABSTRACT

Objective: To determine frequency of various complications of low birth weight babies during 1st three days of admissions. **Patients and Methods:** This Descriptive study (case series) was conducted at Department of Gynecology & Obstetrics and neonatal nursery of pediatric department LUH Hyderabad. All the low birth babies were evaluated for various complications while the data was collected on pre-designed proforma and analyzed in SPSS version 10.00. **Results:** Out of total 1511 deliveries at LUH Hyderabad, 565 newborn were LBW giving prevalence of 37.4%. Out of these 565 LBW, male newborn were 55.8% and females were 44.2%. Immediate problems with decreasing frequency either alone or in combination in 237 (41.9%) admitted newborn babies out of these 565 LBW babies included jaundice in 40.1%, birth asphyxia in 25.7%, RDS in 21.1%, hypothermia in 19.8%, hypoglycemia in 19.0%, congenital malformations in 6.3%, NEC in 5.1% and IVH in 4.2% babies. **Conclusion:** Major problems of these children found, included jaundice, birth asphyxia, hypothermia, hypoglycemia, RDS and sepsis.

Key Words: Prevalence, Low birth weight, complications, problems.
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INTRODUCTION

More than 20 million infants worldwide, representing 15.5% of all births are born with low birth weight. More than 96% low birth weight babies are born in developing countries and incidence of low birth weight in developing countries (16.5%) is more than double to that of developed countries (7.0%).¹⁻³ 25% of neonates born in Pakistan are low birth weight.⁴

Low birth weight is associated with high mortality (40%) as compared to those with normal birth weight.⁵ Major problems and causes of mortality (91%) in them are attributed to neonatal sepsis, birth asphyxia and respiratory distress syndrome.⁶ Low birth weight is most common

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COMPLICATIONS OF LOW BIRTH WEIGHT BABIES

risk factor for hypoglycemia (47.47%).⁷ As birth weight decreases, more problems are faced by these babies i.e. in babies weighing 1000-2000 g, main causes of death include pre-maturity and its related complications(35%), congenital malformation (23%), sepsis (19%) and birth asphyxia (16%).^{2,8} Intra-ventricular/peri-ventricular hemorrhage is also common in low birth weight babies and is inversely related to birth weight and gestational age i.e. 75% in babies weighing <2000gms and <34 weeks gestation.⁹ Necrotizing enterocolitis is another problem found in preterm low birth weight babies (1-7%) babies and its chances increase by decreasing weight i.e. 10% in < 1500gms.¹⁰ Incidence of jaundice in low birth weight babies is higher (35.6%) as compared to normal birth weight babies (16.9%).¹¹ Hypothermia (34.8%) is also a significant problem in low birth weight babies.¹²

This study was aimed at estimating burden of complications of low birth weight babies during 1st three days so that preventive management strategies for low birth weight and its complications should be formulated

PATIENTS AND METHODS

This six months descriptive case series study conducted at department of Gynecology & Obstetrics and neonatal nursery of paediatric department LUH Hyderabad. All babies born in LUH Hyderabad during the study

period were registered in birth register. Babies with birth weight 2500 g or less were labeled as LBW and 237 LBW babies were enrolled and admitted in nursery at Paediatric department LUH Hyderabad. As this was a descriptive study, no interventions were applied and hospital protocols for management of LBW were applied. Complete data was recorded and reviewed on pre-coded proforma. The methods for the determinations of various clinical parameters are as under:

- Low birth weight: babies with birth weight <2500 g or 5.5lbs.
- Hypoglycemia: Blood sugar < 45mg/dl measured on bedside Gluco-meter by sticks and confirmed by measuring blood glucose.
- Sepsis: Presence of three or more of these i.e. lethargy, refusal to feed, vomiting, seizures, temperature < 35C or >38.5C or CBC showing WBC count >20,000cmm or < 5000/cmm and positive blood culture will be labeled as sepsis
- Birth asphyxia: The babies not crying or failing to initiate respiratory effort following birth for one minute and APGAR score of 0-3 for >5 minutes.
- Hypothermia: Cold to touch and rectal temperature <35C.
- Intraventricular hemorrhage: Presence of two or more of these i.e. lethargic, bulging fontanel, apnea (cessation of breathing for>20 sec with bradycardia i.e. Heart rate < 100 beats per minute) or

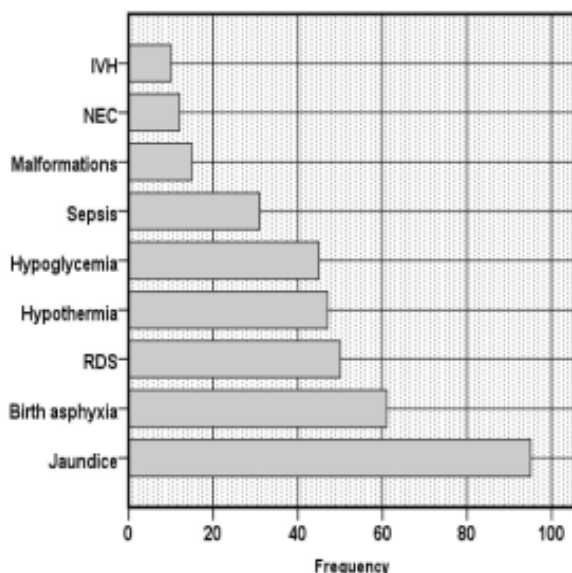
TABLE-1
FREQUENCY DISTRIBUTION OF DIAGNOSED PROBLEMS IN ADMITTED LOW BIRTH WEIGHT BABIES ACCORDING TO DAY OF LIFE
(n=237)

Problems	Frequency by Day of life			Total
	1 st day	2 nd day	3 rd day	
Jaundice	23(9.7%)	31 (13.1%)	41(17.3%)	95(40.1%)
Birth asphyxia	61(25.7%)	-	-	61(25.7%)
RDS	50(21.1%)	-	-	50(21.1%)
Hypothermia	31(13.1%)	11(4.6%)	5(2.1%)	47(19.8%)
Hypoglycemia	33(13.9%)	9(3.8%)	3(1.3%)	45(19.0%)
Sepsis	-	23(9.7%)	10(4.2%)	31(13.1%)
Malformations	15(6.3%)	-	-	15(6.3%)
NEC	-	4(1.7%)	8(3.4%)	12(5.1%)
IVH	2(0.8%)	3(1.3%)	5(2.1%)	10(4.2%)

RDS- respiratory distress syndrome; NEC- necrotizing enterocolitis; IVH- intraventricular Hemorrhage

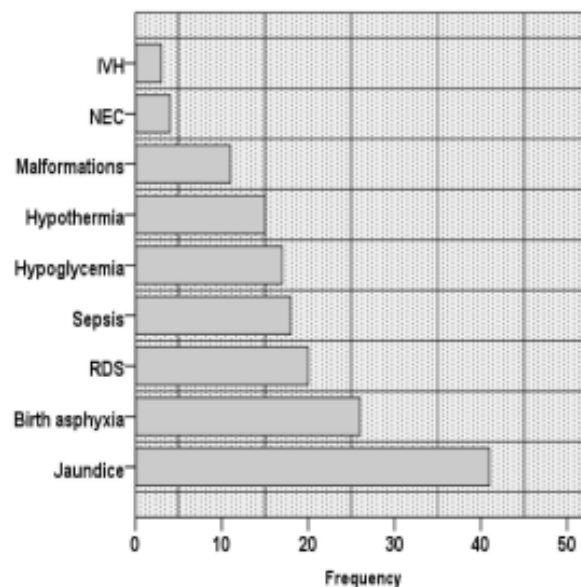
COMPLICATIONS OF LOW BIRTH WEIGHT BABIES

GRAPH- 1
FREQUENCY DISTRIBUTION OF ADMITTED
LOW BIRTH WEIGHT BY IMMEDIATE
PROBLEMS
(n=237)



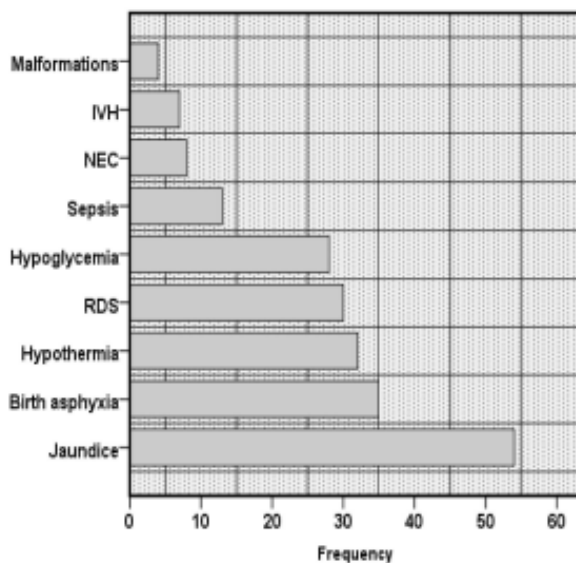
IVH- intraventricular hemorrhage; NEC- necrotizing enterocolitis; RDS- respiratory distress syndrome

GRAPH-2
FREQUENCY DISTRIBUTION OF ADMITTED
FULL TERM LOW BIRTH WEIGHT
ACCORDING TO IMMEDIATE PROBLEMS
(n=148)



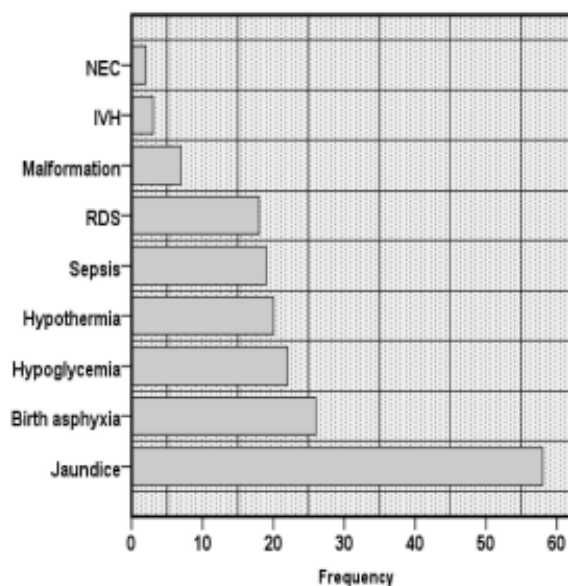
IVH- intraventricular hemorrhage; NEC- necrotizing enterocolitis; RDS- respiratory distress syndrome

GRAPH-3
FREQUENCY DISTRIBUTION OF ADMITTED
PRETERM LOW BIRTH WEIGHT ACCORDING
TO IMMEDIATE PROBLEMS
(n=89)



IVH- intraventricular hemorrhage; NEC- necrotizing enterocolitis; RDS- respiratory distress syndrome

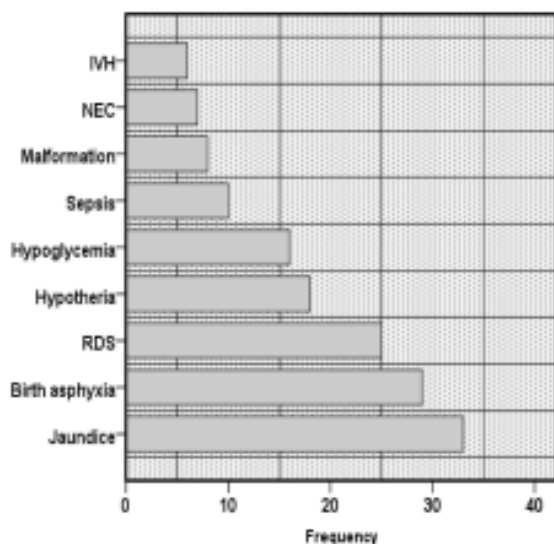
GRAPH-4
FREQUENCY DISTRIBUTION OF ADMITTED
NEWBORN WITH BIRTH WEIGHT 2500-1500 g
ACCORDING TO IMMEDIATE PROBLEMS
(n=133)



NEC-necrotizing enterocolitis; IVH- intraventricular hemorrhage; RDS- respiratory distress syndrome

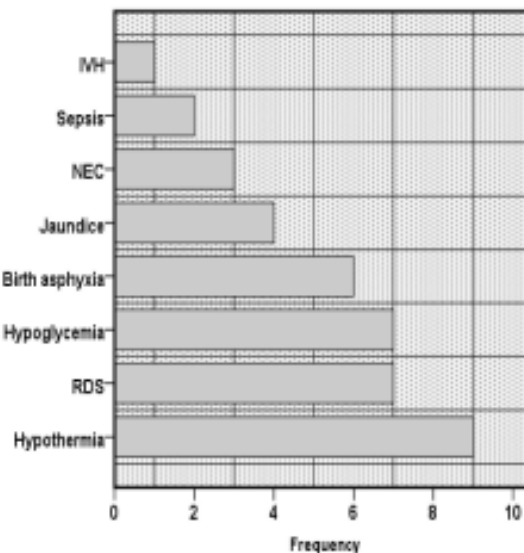
COMPLICATIONS OF LOW BIRTH WEIGHT BABIES

GRAPH-5
FREQUENCY DISTRIBUTION OF ADMITTED
NEWBORN WITH BIRTH WEIGHT 1000-1499 g
ACCORDING TO IMMEDIATE PROBLEMS
(n=94)



IVH- intraventricular hemorrhage; NEC-necrotizing enterocolitis; RDS- respiratory distress syndrome

GRAPH-6
FREQUENCY DISTRIBUTION OF ADMITTED
NEWBORN WITH BIRTH WEIGHT 999-750 g
ACCORDING TO IMMEDIATE PROBLEMS
(n=10)



IVH- Intraventricular hemorrhage; NEC-necrotizing enterocolitis; RDS- respiratory distress syndrome

seizures and ultrasound brain showing germinal matrix hemorrhage with or without ventricular enlargement and/or bleeding in brain tissue surrounding ventricles appearing as anechoic areas on ultrasound.

- Necrotizing Enterocolitis: Presence of 2 or more of these i.e. (i) feeding intolerance (ii) abdominal distension (iii) gross bloody stools and x-ray abdomen showing intramural gas (pneumatosis intestinalis).
- Respiratory distress syndrome: Presence of two or more of these i.e. (i) tachypnea >60 breaths/ minute (ii) expiratory grunting (iii) chest retractions (vi) cyanosis and x-ray chest showing uniform reticulo-granular pattern and air broncho gram.
- Jaundice: Yellowish discoloration of skin and mucous membranes confirmed by serum bilirubin concentration >5mg/dl.
- Congenital malformations: Any visible structural defect.

The data was analyzed using SPSS-10. As this was a descriptive study hence no statistical test was applied. Frequencies of all variables including sepsis,

respiratory problems (like respiratory distress syndrome); hypoglycemia, intra-ventricular hemorrhage, necrotizing entero-colitis, jaundice, hypothermia and congenital malformations were calculated as percentage and presented in tabulated and graphical forms. Effect modifiers or confounding variables like sex and day of life were controlled by stratification and were presented in tabulated and graphical forms.

RESULTS

During study period total number of deliveries in Liaquat university hospital was 1511 and total number of Low birth weight (LBW) babies were 565 (37.4%) of total deliveries. Out of 565 LBW, 237 (41.9%) LBW babies with one or more problems were admitted in nursery at pediatric department and were evaluated for immediate complications.

Graph-1 shows immediate problems among 237 admitted LBW babies. Jaundice, birth asphyxia, RDS, hypothermia and hypoglycemia was diagnosed in 95 (40.1%), 61 (25.7%), 50 (21.1%), 47 (19.8%) and 45 (19.0%) respectively. Other problems diagnosed included culture positive sepsis in 31 (13.1%), congenital malformations in 15 (6.35%) and NEC and IVH

was diagnosed in 12 (5.1%) and 10 (4.2%) respectively.

Table-12 shows frequency of problems in 237 admitted LBW babies by day of life. Major problems diagnosed on the first day of life included Birth asphyxia in 61 (25.7%), RDS in 50 (21.1), hypoglycemia in 33 (13.9%), hypothermia in 31 (13.1%), jaundice in 23 (9.7%) and congenital malformation in 15 (6.35%) babies and IVH was diagnosed in only 2 (0.8%) babies on first day of life. Problems faced by admitted LBW babies on second day of life included in decreasing frequency: jaundice in 31 (13.1%), sepsis in 23 (9.7%), hypothermia in 11 (4.6%), hypoglycemia in 9 (3.8%), NEC in 4 (1.7%) and IVH in 3 (1.3%). Frequency of Jaundice and sepsis diagnosed on third day of life was 41 (17.3%) and 10 (4.2%) respectively followed by NEC in 8 (3.4%), hypothermia 5 (2.1%) and IVH in 5 (2.1%) babies.

Graph-2 shows distribution of immediate problem in 148 full term newborn out of 237 admitted LBW babies. Out of these 148 full-term LBW babies, Jaundice was diagnosed in 41 (27.7%) babies, birth asphyxia in 26 (17.6%), RDS in 20 (13.5%), culture positive sepsis in 18 (12.1%), hypoglycemia in 17 (11.5%), hypothermia in 15 (10.1%) while congenital malformations, NEC and IVH were problems diagnosed in 11 (7.4%), 4 (2.7%) and 3 (2.0%) respectively.

Graph-3 shows distribution of immediate problem in 89 preterm newborn out of 237 admitted LBW babies. Jaundice was most common problem occurring in 54 (60.7%) newborns followed by birth asphyxia in 35 (39.3%), hypothermia in 32 (36.0%), RDS in 30 (33.7%), hypoglycemia in 28 (31.5%), sepsis in 13 (14.6%), NEC in 8 (9.7%), IVH in 7 (7.9%) and congenital malformations in 4 (4.5%) preterm LBW babies.

Graph-4 shows distribution of problems in 133 out of 237 admitted babies and having weight 2500-1500 g. Jaundice was most common problem occurring in 58 (43.6%) newborns followed by birth asphyxia in 26 (19.5%), hypoglycemia in 22 (16.5%), hypothermia in 20 (15.0%), sepsis in 19 (14.3%), respiratory distress syndrome in 18 (13.5%), congenital malformations in 7 (5.3%), IVH in 3 (2.3%) and NEC in 2 (1.5%) newborn babies.

Graph-5 shows distribution of problems in 94 out of 237 admitted babies and having weight 1499-1000 g. Jaundice was most common problem occur-

ring in 33 (35.1%) newborns followed by birth asphyxia in 29 (30.9%), respiratory distress syndrome in 25 (13.5%), hypothermia in 18 (19.1%), hypoglycemia in 16 (17.0%), sepsis in 10 (10.6%), congenital malformations in 8 (8.5%), NEC in 7 (7.4%) and IVH in 6 (6.4%) newborn babies.

Graph-6 shows distribution of problems in 10 out of 237 admitted babies and having weight 999-750 g. Hypothermia was most common problem occurring in 9 (90.0%) newborns followed by respiratory distress syndrome in 7 (70.0%), hypoglycemia in 7 (70.0%), birth asphyxia in 6 (60.0%), jaundice in 4 (40.0%), NEC in 3 (30.0%), sepsis in 2 (20.0%), IVH in 1 (10.0%) and no congenital malformation was noted in these children.

DISCUSSION

We conducted this study at Liaquat university hospital Hyderabad to determine immediate problems associated with LBW babies during 1st three days of life. Differences in incidence and characteristics of LBW reflects multiple risk factors and may be due to maternal malnutrition, maternal medical illnesses, poverty, inadequate knowledge about antenatal care and/or no antenatal care, educational, ethnic and racial backgrounds and may be male baby preference society where male babies are delivered at health set-ups.

Regarding problems of LBW babies (n=237) in our study, Jaundice (40.1%), birth asphyxia (25.7%), respiratory distress syndrome (21.1%), hypothermia (19.8%), hypoglycemia (19.0%) and sepsis (13.1%) were leading problems of LBW babies followed by congenital malformations in 6.3%, necrotizing enterocolitis (NEC) in 5.1% and intraventricular hemorrhage (IVH) in 4.2% babies. Frequency of the problems in LBW babies increased with decreasing gestational age and birth weight.

Many studies have been conducted regarding morbidities and mortality in LBW babies showing increased mortality and same patterns of problems in LBW babies with decreasing gestational age and birth weight.^{13, 14}

Study conducted in Peshawar reported 52.52% mortality in LBW babies with neonatal sepsis, birth asphyxia and respiratory distress syndrome contributing to 91% mortality in them.⁶

Khan et al study from Peshawar reported that Hypoglycemia was seen in 34% SGA babies and 32.3% preterm babies. SGA babies are at increased risk of

hypoglycemia as compared to AGA newborn (34% vs 3%) with symptomatic hypoglycemia more common in preterm babies vs term babies (32.3% vs 28.9%).¹⁵

De Kumar et al study from Kolkata, India on blood glucose level in normal and low birth weight newborn and impact of early breast feeding in tertiary care hospital reported overall incidence of hypoglycemia in 49 (32.67%) out of 150 newborn. The study reported that incidence of hypoglycemia was greater in LBW babies than normal birth weight babies (64% vs 14% respectively), SGA than AGA (64% vs 26% respectively; $P < 0.01$) and preterm than term counterparts (77.77% vs 22.95% respectively; $P < 0.01$).¹⁶

Study from Bangladesh along with other problems in preterm babies reported sepsis in 32%, perinatal asphyxia in 20%, jaundice in 24%, hypoglycemia in 8%, temperature instability in 6%, RDS in 6%, NEC in 4%, congenital malformations in 4% and IVH in 2% babies.¹⁷

Miller et al study on hypothermia in very low birth weight infants reported hypothermia in 56.2% VLBW babies.¹⁸

Ismail et al study on premature and low birth weight neonates and their management at Shaikh Zayed hospital, Lahore reported that the proportion of preterm and LBW with congenital malformations was 7.3% as compared to 5.4% among remaining deliveries.¹⁹

Study from Allama Iqbal Medical college/Jinnah Hospital, Lahore on frequency of intraventricular hemorrhage in preterm neonates reported that out of 100 patients, 12% patients developed IVH. Gestational age was followed for these showing that 63% presented were from 30 to 35 completed weeks of gestation. Most of the neonates were VLBW (41%). 37% were LBW, 13% were ELBW and 09% were incredibly low birth weight. Study also reported that 11% of these babies developed IVH during first 24 hours of life and out of total, 09% had grade-I IVH, 3% had grade-II IVH, 01% had grade-III IVH and 02% developed grade-IV IVH. Study concluded that IVH is major problem of preterm infants and is inversely related to birth weight of neonate.²⁰

We recommend further studies analyzing risk factors and mechanisms behind this varying prevalence, characteristics and problems of LBW with large sample size and multiple settings to reach firm conclusion.

CONCLUSION

Our study also showed that LBW is an important risk factor for various complications including jaundice, birth asphyxia, RDS, hypoglycemia, hypothermia, sepsis, IVH, NEC and congenital malformations. Frequency of these problems increased with decreasing gestational age and birth weight. We recommend health education of mothers and strengthening of health care facilities at both community and facility levels to overcome the burden of LBW. Strategies and interventions should be identified for timely recognition and management of problems in LBW babies.

AUTHORS INPUT

FS, Conception of idea and data collection **GS, AR**, Data analysis and writing of manuscript, **AH** Citation, **ME**, Review the manuscript and final editing

Conflict of Interest: No conflict of interest as per authors declaration

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COMPLICATIONS OF LOW BIRTH WEIGHT BABIES

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