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Morbidity and Mortality of Low Birth Weight Baby

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Abstract

This was a prospective study conducted in a cohort of live normal full term singleton newborns delivered in Rajshahi Medical College Hospital with the objective to explore their early neonatal health as well as the role of low birth weight on it. A total 770 live normal newborns were Included in this study. For data collection APGAR Score Estimating Checklist and one protested structured questionnaire were used. Simple descriptive as well as analytical techniques including Chi-square t test were done.

The results of this study suggested that low weight (LBW) babies were more prone to develop early neonatal morbidity and mortality than normal birth weight (NBW) babies. LBW infants needed more resuscitation and responded less to resuscitative effort than the infants of NBW. Birth asphyxia was the commonest cause of early neonatal morbidity and mortality.

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Introduction

Neonate weighing less than 2500 gm at birth are termed low birth weight (LBW), LBW infants of two clinical types, First one those born before 37 weeks (preterm) and secondly, those babies who have intrauterine growth retardation i.e. small for gestational age (SGA)[1].

Globally 20 million infants per year born with birth weight below 2500gm (LBW) corresponding to 17% of all births[2]. More than 19 million (95%) of these LBW infants are born in the developing countries. Bangladesh, India and Pakistan accounts for about 10 million LBW infants[3]. LBW contributes to estimate 9.1 million infants death each year all over the world[4].

Birth weight is reliable and sensitive indicator for predicting the immediate or late outcome of a newborn. The birth weight of an infant is the single most important determination of its survival, illness, growth and development[2-8]. LBW infants are at increased risk of different types of early neonatal complications like birth asphyxia. septicemia, respiratory distress syndrome hypothermia, hypoglycemia, neonatal jaundice etc[9]. LBW is an important cause of perinatal, neonatal and post natal mortality and morbidity. About 60% of infants' deaths occur in the neonatal period in rural areas of Bangladesh and most of them are related to LBW. Deaths of LBW infants are 30 times more frequent than deaths of newborns of normal birth weight[10].

Unfortunately, there is no separate neonatal unit under pediatric department of Rajshahi Medical College Hospital to face the neonatal problems. This study was done to evaluate the mortality and morbidity of LBW in this existing set-up so that appropriate corrective measures can be taken to reduce the outcome.

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Methodology

This was a prospective study conducted in Obstetrics and Gynecology department & Pediatric Dept. in Rajshahi Medical College Hospital (RMCH). This study recruited 770 full term singleton live newborns. Exclusion criteria considered were congenital abnormality, any birth trauma, prolonged labor (>24 hours), toxemia of pregnancy, antepartum hemorrhage or any other systemic disease of the mother like diabetics mellitus. Data were collected by APGAR Score Estimating Checklist and one pretested structured questionnaire. The APGAR Score of the new-born was estimated just after birth by the APGAR Score Estimating Checklist. The questionnaire was designed to record birth weight, suckling ability, and any morbidity and mortality of the newborns during early neonatal period (up to 7 days after birth) by hospital or both hospital and domiciliary follow up. Full term babies were primarily selected on the basis of their mother's last menstrual period data, and these were confirmed later on at any convenient time within 2 days of their birth by clinical examination scoring on the conditions of their skin texture, skin color, breast size and ear firmness. APGAR Scores of newborns were measured at 1and 5 minute of their birth. Weights of the new-born were measured at any convenient time within 1st hour of birth by Detecto type baby weight machine. Information regarding suckling ability of the new-borns during 1st hour of birth, incidence of any morbidity and mortality of the newborns were collected by close hospital of domiciliary follow up of the newborns, interviewing mothers and by consulting the concerned doctors. Descriptive & analytical techniques involving frequency distribution, computation of percentage, mean, SD etc were done. Association between quantitative and qualitative variables and birth weight was studied using chi-square test and t-test.

Results

Incidence of birth asphyxia among the LBW babies was 10.0%. It was only 1.4% among the NBW babies. The difference of the incidence of birth asphyxia between the LBW and NBW babies was statistically significant (p<000).

Table- I: Low birth weight and birth asphyxia.

Level of birth weight (kg)	Birth asphyxia		Total	$P(X^2)$
	Present N (%)	Absent N (%)	No (%)	
< 2.5	42 (10.0)	373 (90.0)	420 (100.0)	.000
≥ 2.5	5 (1.4)	345 (98.6)	350 (100.0) (45.46)	
Total	47 (6.11)	723 (93.89)	770 (100.0) (100.0)	

Table- II: Low birth weight and APGAR score at I and 5 minutes

Birth Weight (kg)	Status of APGAR score						Total	$P(x^2)$	
	-3 (Severe depression)		4-6 (Mild depression)		7-10 (No depression)			1min	5min
	1min n(%)	5min n(%)	1min n(%)	5min n(%)	1min n(%)	5min n(%)			
< 2.5	16(3.8)	6(1.4)	23(5.5)	12(2.9)	381(90.7)	402(95.7)	420(100.00)	.000	0.19
≥ 2.5	(84.2)	(100.0)	(85.2)	(75.0)	(52.5)	(53.7)	(54.54)		
	3 (0.9)	0(0.0)	4 (1.1)	4(1.1)	343(98.0)	346(98.9)	350 (100.0)		
	(15.8)	(0.0)	(14.8)	(25.0)	(47.5)	(45.3)	(45.46)		
	19(2.47)	6(0.77)	27(3.51)	6(2.0)	724	748	770(100.0)		
	(100.0)	(100.0)	(100.0)	(100.0)	(94.02)	(97.14)	(100.0)		
					(100.0)	(100.0)			

The status of APGAR scores for 770 full term normal live births at 1 and 5 minutes in different birth weight groups were shown in Table II. Out of 770 full term normal live births, 19 (2.47%) newborns were

severely depressed (APGAR scores of 0-3) at 1 minute. Majority (84.21%) of them were LBW. At 5 minutes, out of 19, who were severely depressed at 1 minute, 6 (0.77%) were still remained severely depressed. All of the severely depressed newborns at 5 minutes were LBW. The mean APGAR score were at 1 and 5 minute significantly higher among the LBW babies than that of NBW babies (Table III).

Table-III: Comparison of mean APGAR scores between LBW and NBW neonates.

Birth weight	Number N	APGAR score (Mean±SD)		t value		P	
		1minute	5minute	1minute	5minute	1minute	5minute
LBW	240	8.22±16.2	8.54±1.32	6.55	4.96	.000	.000
NBW	350	8.90±1.22	8.97±1.04				

Out of 420 LBW neonates, 46 (11.0%) had poor suckling ability within one of their birth. I comparison, it was 16 (4.6%) out of 350 NBW neonates. The difference in the proportions of poor suckling ability of these two birth weight groups was statistically significant (P=.001) (Table IV)

Table- IV: Low Birth weight and suckling ability of the neonates

Birth weight	Status of suckling ability		Total a (%)	P (x^2)
kg	Good n (%)	Poor n (%)		
<2.5	374(89.0)	46 (11.0)	420(100.0) (54.54)	0.000
≥ 2.5	334 (95.4)	16 (4.5)	350(100.0) 945.46)	
Total	708 (91.9)	62 (8.1)	770(100.0) (100.0)	

Table-V: Episodes of morbidity during early neonatal period and birth weight of the neonates

Morbidity	Level of birth weight		Total n%
	LBW (<2.5kg) n (%)	NBW (≥ 2.5kg) n (%)	
Birth asphyxia	37 (78.72)	10 (21.28)	47 (100.0) (40.52)
Acute respiratory tract infection	14 (70.0)	6 (30.0)	20 (100.0) (17.24)
Diarrhoea	9 (64.29)	5 (35.71)	14 (100.0) (12.06)
Neonatal Jaundice	4 (33.33)	8 (66.67)	12 (100.0) (10.34)
Opthalmological problem	5 (45.45)	6 (54.55)	11(100.0) (9.48)
Skin problem	4 (50.0)	4 (50.0)	8 (100.0) (6.89)
Umbilical sepsis	2 (50.0)	2 (50.0)	4 (100.0) (3.45)
Total	75 (64.66)	41. (35.34)	116 (100.0) (100.0)

During early neonatal follow up, 17 neonates dropped out. Among the rest 753 babies, 7 (0.92%) dies within first week of their life. Out of these dead babies, 5 (71.43%) were of the LBW group. Commonest (57.14%) cause of early neonatal death was birth asphyxia. Other's causes of early neonatal death were acute respiratory infection (ARI) (28.58%) and septicemia (14.28%).

The mean episode of morbidity during early neonatal period was 0.15. The mean episode of morbidity among the LBW neonates (0-19) was significantly higher than that of NBW neonates (0.09) (t=3.15, p-.002). The table V showed that the morbidity were more among the LBW neonates that that of NBW neonates. Birth asphyxia was also being identified as the commonest cause of morbidity during the early neonatal period of the infants.

Discussion

Birth asphyxia was the sensitive indicator to assess the health status of new born at birth. In the present study it was also found more than 6 & though major risk factors like preterm, obstructed labor, toxemia of pregnancy etc. were controlled during selection of the study subjects. It was too high compared to that in developed countries like in UK (0.6&)[11]. Even it was also remarkable high compared to that in the developing countries, 3 & of all newborn babies (3.6 millions) develop moderate to severe birth asphyxia[12]. It reflected the poor prenatal health as well as total health condition of Bangladesh. This study suggested that low birth weight was significantly associated with the birth asphyxia. Similar finding were shown by other studies[13,14].

APGAR score at 1 minute provides a useful index for prediction the need for resuscitation & the immediate physical condition of newborn infants. Infants with low scores specially 0-3 at 5 minutes of age are subjects to a high risk of neurological complications and death[2,15]. The present study indicated that LBW infants need more resuscitation and they are at greater risk to develop immediate neonatal as well as late complications especially neurological morbidity that the normal one. NBW infants responded more to resuscitative efforts than the infants having LBW. This was consistent with the findings of another study in India[16].

Status of suckling ability of the newborns within 1st hr of life is another important indicator of the well being of the newborn[17]. In this study the data analysis regarding suckling ability of the newborns suggested that LBW babies were significantly unhealthy and might have greater risk to developed breast-feeding failure than normal one.

Mortality and morbidity is inversely associated with birth weight during early natal period[15]. In different studies[9,14,18,20.] in Bangladesh and India it was reported that more than 80% of the early neonatal death belong to LBW group. From the findings of these studies, it is clear that LBW is a risk for newborns survival. The results of the present study also showed that the infants of LBW have greater risk to develop mortality and morbidity than the infants of normal birth weight.

This study emphasizes to establish a neonatal unit to reduce the neonatal mortality and morbidity for LBW babies in Rajshahi medical college hospital.

Conclusion

The existing facility which are available in Bangladesh for care of newborn are not adequate this is available in mainly tertiary care hospitals practically in Dhaka. The vast majority (90%) of population are living in rural areas and most of the deliveries (90%) occurring in rural areas by untrained person, so, the real breakthrough in neonatal care and reduction of low birth weight mortality and morbidity will occur when the improve quality of the prenatal and medical care will be provided in rural areas.

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