



A STUDY ON VERY LOW BIRTH WEIGHT BABIES ADMITTED IN NICU

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ABSTRACT

Background: Very low birth weight (VLBW) neonates are at high risk for morbidity and mortality. Preterm birth is one of the major clinical problems in Obstetrics and Neonatology.**Aim & Objective:** To study morbidity and mortality pattern of VLBW neonates admitted to NICU at Department of Pediatrics, Civil hospital, Ahmedabad.**Methodology:** This cross-sectional prospective observational study was performed on all hospitalized VLBW neonates. Their course during hospitalization and relevant was documented in pre designed performa.**Results:** In the present study, out of 1748 neonates, 374 (21.39%) were VLBW with 69% males. Mean gestational age was 31.3 ± 1.8 weeks; mean birth weight 1279 ± 193 grams. Common morbidities in VLBW neonates are Neonatal jaundice, Probable sepsis, Apnea of prematurity and RDS. Mortality rate is improved with increasing gestational age and weight.**Conclusion:** Birth weight and mechanical ventilation are the 2 major factors responsible for mortality. A decline in the mortality and morbidity of these newborns (especially the ELBW neonates) can only be made possible through optimizing perinatal care including regionalization, CPR at birth, early NCPAP and quality improved collaborative (QIC) in our NICU.**KEYWORDS :** Very Low Birth Weight; Morbidity and mortality; Risk Factors; NIC

INTRODUCTION:

Preterm birth is one of the major clinical problems in Obstetrics and Neonatology as it is associated with perinatal mortality, serious neonatal morbidity and in some cases childhood disability. It accounts for 60-80% of all neonatal morbidity and mortality. Very low birth weight (VLBW) neonates comprise 4-8% of total live-births but about one-third of deaths during the neonatal period occur in this group of newborns.^{1,2} -Studies have reported normal outcomes in approximately 73% of VLBW neonates.³ Figures vary widely from country to country with reports of up to 90% survival from developed countries to 40% in the developing world, its 63% in India.³

Data on the probability of survival of infant in high risk pregnancies can be of great value in guiding management. This information can help both clinical staff and parents to decide if and when to intervene in high risk pregnancies. The aim of this study is to evaluate the immediate and short term morbidity and outcome in neonates weighing 1-1.5 kg.

MATERIALS AND METHODS:

This cross sectional prospective study was conducted at Department of Pediatrics, Civil hospital, Ahmedabad. A Total of 1748 neonates were admitted in NICU of Civil hospital, Ahmedabad were evaluated from September 2019 to February 2020 for VLBW neonates.

All live born very low birth weight babies (1-1.5 kg) admitted in NICU within 24 hours of delivery (weight by electronic weighing machine and gestation age by modified Ballard score) were included. Babies with lethal congenital malformation and babies who are discharged against medical advice were excluded from study.

The maternal details like antenatal profile, medical complications during pregnancy and labor, maternal morbidities, treatment profile, intranatal care and delivery outcome were noted. Patients were investigated and monitored during hospitalization and managed as per standard protocols. The study was carried out to determine the morbidity, rate of survival and complications in VLBW neonates admitted to a level III neonatal intensive care unit at Department of Pediatrics, Civil hospital, Ahmedabad.

STATISTICAL ANALYSIS:

Data was entered into Microsoft excel and analysed by using Epi info 7.1.1 software. Categorical data was presented into frequency and percentage and compared with chi square test. P value less than 0.05 was considered as statistically significant.

RESULTS:

Total of 1748 neonates were admitted in NICU of Civil hospital, Ahmedabad during the study period, out of which 157 babies with birth weight 1-1.5 kg and gestational age ranging from 28 to 36 weeks were studied and the rest were excluded as per exclusion criteria. This study evaluated all the live born VLBW babies admitted in NICU both inborn and out born. The perinatal factors contributing for VLBW, and the survival patterns and the factors responsible with survival were noted.

Table 1: Distribution according to Birth weight and gestational age

Profile		No. of patients (n=157)	Percentage (%)
Birth weight (grams)	1000-1249	58	37%
	1250-1499	99	63%
Gestational age (weeks)	28-32	38	24%
	32-34	100	64%
	34-36	19	12%

In the present study, 63% of babies were having weight between 1250-1499g, 37% having weight between 1000-1249g. 24% of babies had gestational age between 28 to 32 weeks 64% babies between 32 to 34 weeks and 12% had gestational age between 34 to 36 weeks.

Table 2: Morbidity Profile

Morbidity Profile		No. of patients (n=157)	Percentage (%)
Gestational maturity	Appropriate for gestational age	124	79%
	Small for gestational age	33	21%
Resuscitation required	No	115	73%
	Yes	42	27%

Neonatal complications	RDS	72	46%
	Sepsis	61	39%
	Probable sepsis	38	24%
	Screen positive sepsis	17	11%
	Culture positive sepsis	6	4%
	Apnea	42	27%
	Neonatal hyperbilirubinemia	97	62%
	Perinatal asphyxia	25	16%
	Hypoglycaemia	11	7%
	NEC	6	4%
	Pulmonary haemorrhage	9	6%
	IVH	5	3%
	Pneumonia	33	21%
	Meningitis	27	17%
	BPD	6	4%
CHD (ASD, VSD)	14	9%	
ROP Screening	Zone I	22	14%
	Zone II	111	71%
	Zone III	24	15%
Outcome	Death	38	24%
	Survived	119	76%

In the present study 79% of babies were appropriate for gestational age and 21% of babies were small for gestational age. In the present study, 27% of babies required resuscitation at birth.

In the present study, neonatal hyperbilirubinemia is seen most commonly in VLBW neonates (62%) followed by RDS, sepsis and apnea. In ROP screening we are not able to do screening of critically ill patients. In Patients who are survived highest incidence was seen for zone II ROP, around 62% followed by zone III (15%) followed by zone I (14%). In the present study 76% patients survived and 24% patients expired.

Table 3: Mortality Profile

Profile (n=157)		Total	Outcome	
			Total Death = 38 (24%)	Total Survival = 119 (76%)
Gender	Female	49	19 (12%)	30 (19%)
	Male	108	19 (12%)	89 (57%)
Birth weight	1000-1249	58	16(10%)	42(27%)
	1250-1499	99	22(14%)	77 (49%)
Gestational age	28-32	38	14 (9%)	24 (15%)
	32-34	100	21 (13%)	79 (51%)
	34-36	19	3 (2%)	16 (10%)
Gestational maturity	Appropriate for gestational age	124	29 (18%)	95 (61%)
	Small for gestational age	33	9 (6%)	24 (15%)
Antenatal steroids	No	51	13 (8%)	38 (24%)
	Yes	106	25 (16%)	81 (52%)

In the present study survival did not correlate with maternal parity, mode of delivery, gestational age and gender. In the present study the mortality in female neonates is 19% and 19% in male neonate, survival not correlated with gender.

In the present study outcome is 27 % newborns are between 1000-1249 grams and 49% are between 1250 to 1499 grams.. The outcome was found to be statistically significant with birth weight, gestational maturity and administrations of steroids.

DISCUSSION:

The improving prognosis for infants of very low birth weight makes it important to give parents an accurate prediction of outcome of their neonates. Thus, authors aimed to provide specific survival rates for very low birth weight babies admitted in present NICU based on birth weight and gestational age.

The incidence of very low birth weight in India is estimated to be 4.5%.⁴ According to SEAR NPD report 2007-08, the incidence of VLBW babies among SEAR countries are as follows: Bangladesh (5.4%), Indonesia (inborn = 4.1%, out-born = 8%), Nepal (0.9%), Sri Lanka (1.6%), Thailand (11.4%).⁵ According to a study in Europe the incidence of VLBW is 1.6% in their country. Another study in South Africa documented an incidence of 8.8%.^{5,6}

Low birth weight is more common in early and late reproductive life. Birth weight increases with increase in parity up to 5 then it again decreases. A study done by Bailot et al. showed that the incidence of VLBW is more between the age group of 18 and 27 years, with a mean maternal age of 26.5 years. According to study published by Italian collaborative group on preterm delivery, mean maternal age for VLBW deliveries was 28±5 years.⁶ In present study the mean maternal age was 27.55±3, which is similar to mentioned studies.⁷

In present study 46% were primigravida and 54% VLBW deliveries were seen in multigravida mothers. In present study PROM was an important maternal risk factor, it was associated with 35% mothers. This could be because of more no. of multiple gestations in present study. According to Arad I et al. PROM was associated with 16.85% in Inborn NICU mothers and 23.73% mothers in out-born NICU who delivered VLBW babies.⁸

Survival rates are more in present study. This may be because; most of the babies are small for gestational age.

There is a wide variability in survival rate as reported in different centers. This is due to difference in patient population, antenatal care, intranatal care, aggressive neonatal care and availability of NICU facilities. Among the Indian studies Basu S et al, found the survival rate to be 63%. Survival and mortality rates in present study varied with respect to birth weight and gestational age.⁹

CONCLUSION:

Our findings reveal that birth weight and mechanical ventilation are the 2 major factors responsible for mortality. Birth weight and gestational age specifically predicts survival of preterm VLBW babies, facilitating decision making for obstetricians, neonatologists and parents. Although survival of VLBW infants in our study is comparable to other studies around the world, a decline in the mortality and morbidity of these newborns (especially the ELBW neonates) can only be made possible through optimizing perinatal care including regionalization, CPR at birth, early NCPAP and quality improved collaborative (QIC) in our NICU. Preterm VLBW infants have varying effects in terms of psychological and financial burden on family in developing countries like India. The factors leading to VLBW delivery in developing countries like India are modifiable and preventable. To improve outcome for out-born babies, high risk pregnancies should be delivered at tertiary care centers.

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