

## **Research Article**

### **A Study of Outcome of Preterm Babies in a Low Resource Hospital**

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**Abstract:** Preterm birth is one of the major problems with increased perinatal mortality and morbidity. The aim was to evaluate the outcome of preterm babies in a low resource hospital. A retrospective study was conducted over a period of 3 years from Jan 2012 to Dec 2014. The medical records of all preterm babies admitted to the NICU were reviewed. The results of 118 preterm babies studied, survival rate was 94.1% and death rate was 5.9%. Male to female ratio was 1.3; 1. Based on gestational age survival rate was 80% in less than 30 weeks, 95% in 30-<34 weeks and 98.3% in 34-37 weeks. Based on birth weight survival rate was 98.3% in LBW, 95% in VLBW and 80% in ELBW group. Sepsis and pulmonary hemorrhage (28.5% each) were the primary causes of death. The conclusion was that survival rate increases significantly with increase in gestational age and birth weight. Sepsis, pulmonary hemorrhage were the leading causes of death.

**Keywords:** VLBW, ELBW, LBW.

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#### **INTRODUCTION**

In India alone, of the 25 million babies who are born every year, one million die, accounting for 25% of the mortality around the world. According to the National Family Health Survey (NFHS-3) report, the current neonatal mortality rate (NMR) in India is 39 per 1,000 live births, accounts for nearly 77% of all the infant deaths (57/1000) and nearly half of the under-five child deaths (74/1000) [1]. The rate of the neonatal mortality varies widely among the different states of India, ranging from 11 per 1000 live births in Kerala to 48 per 1000 live births in Uttar Pradesh. The neonatal mortality rate in Karnataka is 38 per 1000 live births. Preterm birth is one of the major clinical problems in obstetrics and neonatology, as it is associated with increased perinatal mortality and morbidity [2]. In a report which was published in The Lancet, the major direct causes of the deaths were preterm birth (27%), infection (26%), asphyxia (23%), congenital anomalies (7%), others (7%), tetanus (7%) and diarrhea (3%) [3]. The data from the tertiary care NICUs in the rural areas which primarily serve the very poor people is scarce. The objective of the study was to study the outcome of preterm in a level 3 NICU in a low resource hospital.

#### **MATERIALS & METHODS**

This hospital based retrospective study was carried out in the neonatal intensive care unit, Narayana superspeciality hospital, Bangalore, Karnataka, India, for a period of 3 years from January 2012 to December 2014. The hospital ethical committee approved the study protocol. Our hospital caters mainly to rural and semi-urban patients, with a significant number of them

being below the poverty line (BPL) income group patients. Approximately 1800 deliveries are conducted per year. All the admitted preterm neonates were enrolled on a structured protocol, which included the data on antenatal care, maternal morbidity, mode and place of delivery, age, weight at admission, gestational age, diagnosis, relevant investigations, duration of stay and outcome. Based on gestational age babies were divided in to 1. < 30 weeks 2. 30-<34 weeks 3. 34 -37 weeks.

**Inclusion criteria:** All the admitted preterm babies

**Exclusion Criteria:** (A) Babies who came in the NICU for a few hours observation and were shifted to mother. (B) Any baby who could not be successfully resuscitated in labor room. Survival was defined as the discharge of a live infant from the hospital. Data regarding birth weight, gestational age, stay in NICU, final cause of death was analyzed.

#### **RESULTS**

Among 118 preterm babies studied 68 were males and 50 were females, the ratio of the male to female was 1.3:1. The overall survival rate was 94.1% (111/118) and death rate was 5.9% (7/118).

Outcome with reference to the gestational age shows, survival of 98.3% (57/58) in 34-37 weeks, 95% (38/40) in 30-< 30 weeks and 80% (16/20) in < 30 weeks group (Table-1).

Outcome with reference to the birth weight shows, survival of 98.3%(57/58) in LBW ,95%(38/40) in VLBW and 80%(16/20) in ELBW group (Table-2).

The primary causes of death were due to pulmonary hemorrhage in 2 cases (28.5%) and sepsis in 2 cases (28.5%) and the remaining 3 cases were due to NEC,HMD and pulmonary hypertension (Table-3).

**Table-1: Outcome based on gestational age**

Groups	Numbers	Survival	%
< 30 weeks	20	16	80
30-<34 weeks	40	38	95
34-37 weeks	58	57	98.3

**Table2: Outcome based on birth weight**

Groups	Numbers	Survival	%
ELBW (<1 kg)	20	16	80
VLBW(1-<1.5 kg)	40	38	95
LBW (1.5-2.5 kg)	58	57	98.3

**Table 3: Primary cause of death based on weight/gestational age**

Primary cause of death	No	<1 kg <30 wks	1-1.49 kg 30-<34 wks	1.5-2.5 kg 34-37 wks	%
Hyaline Membrane disease	1	1	0	0	14.2
Sepsis	2	1	1	0	28.5
Necrotizing Enter colitis	1	1	0	0	14.2
Pulmonary hemorrhage	2	1	0	1	28.5
Pulmonary hypertension	1	0	1	0	14.2
Total	7	4	2	1	

**DISCUSSION**

Preterm birth is one of the major clinical problems in obstetrics and neonatology, as it is associated with increased perinatal mortality and morbidity. Accurate data on the morbidity and mortality are useful for many reasons. It is important for the providers of primary care, investigators, local and national health administrators, and for decision makers to design interventions for prevention and treatment and to implement and evaluate health care programs and also data from the NICUs of low resource settings is very limited [4].

The objective of the present is to study the outcome of preterm babies in a level III NICU in a low resource hospital. With reference to the gender male was more than the females in the ratio of 1.3; 1 and similar pattern was seen by Roy *et al.*; [5] may be related to the preference for the male child in the society and the biological vulnerability of the males to infection.

With reference to the survival, survival rate was 94.1% and death rate was 5.9% and similar pattern was seen by Zullini *et al.*; [6] and there is a great variation in preterm mortality statistics between NICUs from different parts of the world. This variation probably reflects the difference in the attending population, antenatal care, admission criteria, specific exclusion & inclusion criteria and level of neonatal care.

With reference to the gestational age and birth weight, survival rate was 80% in < 30 weeks and ELBW babies which is much higher than study by Segal *et al.*; (57%) [7] survival rate of VLBW/30-34 weeks was 95% when compared to Roy *et al.*; (84.3%) [2].The survival rate in LBW/34-37 weeks babies is 98.3% when compared to the national prenatal database (93.9%) [8].

On analysis present study shows, sepsis and pulmonary hemorrhage (28.5% each) were the leading causes of death as opposed to birth asphxia in a cohort study by Basu *et al.*; (32%) [4].This variation probably reflects the difference in the attending population, antenatal care, admission criteria, specific exclusion & inclusion criteria and level of neonatal care.

A low resource NICU has many inherent problems relating to the population catered by it. Population we cater to are mostly people with financial limitations. With the limited finances and time commitment the compliance of these patients is also suboptimal. Low resource hospitals have to work with these handicaps. For such units to work effectively it is wise to adopt certain policies by which "intensive care" is provided, but not necessarily "invasive care".

**CONCLUSION**

This study shows survival rate increases significantly with increase in gestational age and birth weight. Neonatal sepsis, pulmonary hemorrhage was

the major contributors to the preterm death. Adequate antenatal, postnatal care and prevention of preterm deliveries will improve the survival.

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