

Short Term Outcome of Preterm Neonates in a Tertiary Care Hospital in Coastal Karnataka

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Abstract

Background: Preterm birth is a major cause of death and a significant cause of long-term morbidity around the world. Complications of preterm birth are the single largest direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million deaths a year, and the second most common cause of under -5 deaths after pneumonia. India ranks first among the 10 countries which account for 60% of the world's preterm births. There is a relative dearth of studies on short term outcomes of the preterm infants in Indian literature. The aim of this study is to find the preterm outcome in terms of morbidity & mortality.

Methods: This was a prospective descriptive study done in a tertiary hospital in south Karnataka. A sample size of minimum of 150 preterm babies (<37 completed weeks) was selected using purposive sampling technique. Multiple gestation and babies with major as well as life threatening congenital anomalies were excluded. Preterm care was given as per standard NICU protocol of the hospital. The neonates were assessed daily for signs and symptoms of prematurity complications. The day of onset of symptoms, their duration, appropriate therapeutic intervention done, and time of symptom resolution or poor neonatal outcome (including death) was recorded up to discharge or till 1 month of admission, whichever is earlier.

Results: Most of the babies were late preterm, while 13.3% and 16.7% were moderate to very, respectively. About 8.7% of the babies required resuscitation at birth with 2% requiring intubation. Neonatal hyperbilirubinaemia was seen in 66.7%, hypoglycemia in 3.3%, and respiratory distress in 17.3% of the babies. Probable sepsis was seen in 8% of babies while culture proven sepsis was seen in 1.3%. Mortality was 8%.

Conclusion: This study shows morbidities more in terms of metabolic, namely hypoglycemia and hyperbilirubinemia. Sepsis, RDS, NEC was comparatively low. Mortality was in line with the global statistics. But we still intend to institute adequate antenatal and postnatal care to improve the outcome quality in premature babies.

Key Words: Morbidity, Preterm, Short term outcome.

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1- INTRODUCTION

Preterm birth is defined by WHO as all births before 37 completed weeks of gestation. Preterm birth can be further subdivided based on gestational age: extremely preterm (<28 weeks), very preterm (28 to <32 weeks) and moderate preterm (32 to <37 completed weeks of gestation). Moderate preterm birth may be further split as early (32 to 34) and late preterm birth (34 to <37 completed weeks) (1).

Preterm birth is a major cause of death and a significant cause of long-term morbidity around the world. Complications of preterm birth are the single largest direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million deaths a year, and the second most common cause of under-five deaths after pneumonia. In almost all high and middle income countries of the world, preterm birth is the leading cause of child death (2).

The significance of preterm birth lies in the complications of prematurity sustained by the infant and the impacts of these complications on the infant's survival and subsequent development. Many clinical research studies on preterm-born infants limit their outcomes to neonatal mortality and morbidity. Complications and the disturbance of normal development may result from factors that influence prenatal development and the etiology of preterm birth, but the extent to which this happens is often unknown (3).

There is a relative dearth of studies on short term outcomes of the preterm infants in Indian literature, and it is in order to broaden our understanding of this subject that we are undertaking this study.

2- MATERIALS AND METHODS

This descriptive hospital-based study was conducted in the Department of Pediatrics, in south Karnataka for 1 year.

2-1. Sampling

Consecutive type of non-probability sampling was followed for selection of study subjects. All eligible babies, fulfilling the eligibility criteria were selected after informed consent for parents.

2-1-1. Inclusion and Exclusion Criteria

1-Live preterm (<37 weeks) neonates delivered in the institute were included in the study.

Neonates with the following criteria were excluded from the samples:

- a) Multiple gestation preterm babies;
- b) Neonates with major congenital anomalies; and
- c) Still born babies.

2-2. Data collection

Detailed physical examination of the baby was done and was documented in a pre-designed proforma. Appropriate investigations including hematological and radiological tests were done any time during the hospital stay as per patient's requirement. Preterm care was given as per standard NICU protocol of our hospital. The neonates were assessed daily for signs and symptoms of complications of prematurity.

3- RESULTS

Male predominance was seen in study subjects with 62% males to 38% females. Full dose of antenatal steroids was given in 71.4% of subjects. Most of the babies were late preterms (70%), while 13.3% and 16.7% were moderate to very preterm, respectively.

Table-1: Distribution of Subjects based on gender

Gender of Baby	N	%
Female	57	38.0%
Male	93	62.0%
Total	150	100.0%

Table-2: Distribution of Subjects based on Gestation Age

Gestation Age	N	%
Late Preterm	105	70.0%
Moderate Preterm	20	13.3%
Very Preterm	25	16.7%
Total	150	100.0%

Weight below 2.5 kg was seen in 61.3% babies while below 1 kg was seen in 7.3% babies. Out of the total of 150 babies, 84.7% were appropriate for their gestation age (AGA) while 15.3% were small for gestational age (SGA).

Table-3: Distribution of Subjects based on Birth weight

Birth Weight (kg)	N	%
> 2.5 Kg	58	38.7%
2.5- 1.5	72	48.0%
1.5 -1.0	9	6.0%
< 1.0	11	7.3%
Total	150	100.0%

Respiratory distress syndrome was seen in 17.3% of the babies. NEC stage 2 was seen in one baby. IVF, Inotropes and antibiotics were required in 34.7%, 5.3% and 38% of babies, respectively. Neonatal Jaundice was seen in 66.7%, and Hypoglycaemia was seen in 3.3% of the babies.

Table-4: Distribution of Subjects based on Requirement of Medical Intervention

Medical Interventions	N	%
Need for IVF	52	34.7%
Need for Inotropes	8	5.3%
Antibiotics < 5 days	44	29.3%
Antibiotics > 5 days	13	8.7%
Jaundice requiring Intervention	27	18.0%

Table-5: Distribution of Subjects based on Presence of Respiratory Distress Syndrome (RDS)

RDS	N	%
No	124	82.7%
Oxygen	11	7.3%
CPAP	15	10.0%
Total	150	100.0%

Probable sepsis was seen in 8% of the babies while culture proven sepsis was seen in 1.3%.

Table-6: Distribution of Subjects based on presence of Sepsis

Sepsis	N	%
No	136	90.7%
Probable	12	8.0%
Proven	2	1.3%
Total	150	100.0%

Out of the total 150 pre-term babies, 92% survived while 8% expired. Poor outcome in preterm babies was observed to be associated with primi-mothers and small-for-gestational-age babies. Poor outcome was also associated with RDS, feeding intolerance, and presence of sepsis.

Table-7: Distribution of Subjects based on Outcome

Outcome	N	%
Survived	138	92.0%
Expired	12	8.0%
Total	150	100.0%

4- DISCUSSION

Infants born preterm are vulnerable to many complications, including respiratory distress syndrome, chronic lung disease, intestine injury, a compromised immune system, cardiovascular disorders, hearing and vision problems, and neurological

insult. Infants born at the lower limit of viability have the highest mortality rates and the highest rates in all complications.

With reference to gender, males were more common, with 62% males to 38% females. A similar pattern was seen by Nath Roy et al.

Perinatal asphyxia was noted in 8% of preemies which was low compared with globally conducted studies. A meta-analysis by Fikadu et al. reported the overall prevalence of 17%. The main reasons for low asphyxia in our unit include good utilization of different intrapartum fetal monitoring equipment and tools, qualified professional staff and quality of care given services to neonates (4).

Respiratory distress was present in 23% of preterm babies while Respiratory distress syndrome was seen in 17.3% of the babies. RDS was observed in 17.5% of pre-term babies in a study by Selvan et al. Respiratory issues are related to delayed transition to air breathing, delayed fluid clearance and surfactant deficiency. Antenatal steroids are given to prevent the respiratory complications of prematurity. In the present study, ante-natal steroids were given to 71.4% of the subjects, hence low RDS (5).

NEC was noted in only one baby, born with less than 32 weeks of gestational age; the mother had not received antenatal steroids and the baby was small for gestational age. However, studies, in general, show that among the premature infants cared for in the NICU, 15% are affected. Low incidence in our unit is due to cautious feeding practices, non-usage of formula feeds, and most importantly maximum aseptic precautions (6).

In the present study hypoglycemia was seen in 3.3% babies. Selvan et al. observed hypoglycemia in 27.5% of pre-term babies compared to 1.6% in term babies [3]. Another study showed that 15% of preterm

infants were hypoglycemic. The major cause is low glycogen and fat stores with limited capacity to generate glucose via the gluconeogenesis pathway or excessive peripheral tissue utilization of glucose (7).

In the present study, probable sepsis was seen in 8% of babies while culture proven sepsis was seen in 1.3% of babies. Sepsis and its clinical implications have been extensively reviewed recently. A meta-analysis showed that preterm babies were 3.36 more likely to develop neonatal sepsis than term babies. This finding is also in line with studies done in the USA and China. The possible explanation is that preterm babies have immature immune and organ systems. Possibility of nosocomial infections are also considered due to prolonged hospital stay, invasive procedures, and indwelling catheters. Therefore, staff training and education about infection prevention are crucial steps to prevent sepsis in NICU (8, 9).

Our study found neonatal hyperbilirubinemia as the major morbidity in 66% of the babies. The higher incidence was seen in a study by Wang et al. This can be because of developmental immaturity in the liver and feeding difficulties (10).

Out of the total of 150 pre-term babies, mortality rate was observed as 8%, much more similar to the study done by Zullini et al., with a mortality rate of 5.9% (11).

5- CONCLUSION

To conclude, this study shows morbidities more in terms of metabolic issues namely hypoglycemia and hyperbilirubinemia. Sepsis, RDS, NEC was comparatively low. Mortality was in line with the global statistics. But we still intend to institute adequate antenatal and postnatal care to improve the outcome quality of premature babies.

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7- FUNDING

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8- CONFLICT OF INTEREST

None declared.

9- ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

10- REFERENCES

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