Short term outcome of preterm neonates in a tertiary care hospital.

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Abstract

Background and objectives: 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 accounts for 60% of the worlds 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 outcome of preterms in terms of morbidity & mortality.

Materials and 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 was assessed daily for signs and symptoms of complications of prematurity. The day of onset of symptoms, duration, appropriate therapeutic intervention done & time for resolution of symptoms or poor neonatal outcome (including death) was recorded upto 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 preterm respectively. About 8.7% babies required resuscitation at birth with 2% requiring intubation. Neonatal hyperbilirubinaemia was seen in 66.7% babies. Hypoglycemia was seen in 3.3% babies. Respiratory distress was seen in 17.3% babies. Probable sepsis was seen in 8% babies while culture proven sepsis was seen in 1.3% babies. Mortality was 8%.

Conclusion: 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 quality of outcome of premature babies.

Keywords: Short term outcome, Preterm, Morbidity.

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Introduction

Preterm birth is defined by WHO as all births before 37 completed weeks of gestation. Preterm birth can be further sub-divided 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. 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 of infants born preterm 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. 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].

Methods and Materials

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

Sampling Technique and Sample Size

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.

Inclusion Criteria:

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

Exclusion Criteria:

1. Multiple gestation preterm babies.

2. Neonates with major congenital anomalies

3. Still born babies

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% subjects. Most of the babies were late pre-terms (70%), while 13.3% and 16.7% were moderate to very pre-term respectively (Tables 1 and 2).

Gender of Baby	N	%
Female	57	0.38
Male	93	0.62
Total	150	1

Table 1:*Distribution of Subjects based on gender of baby.*

Gestation Age	N	%
Late Pre-term	105	0.7
Moderate Pre-term	20	0.133
Very Preterm	25	0.167
Total	150	1

Table 2: *Distribution of Subjects based on Gestation Age.*

Weight below 2.5 kg was seen in 61.3% babies while below 1 kg was seen in 7.3% babies. Out of total 150 babies, 84.7% were appropriate for their gestation age(AGA) while 15.3% were small for gestation age(SGA) (Table 3).

Birth Weight (kg)	N	%
> 2.5 Kg	58	0.387
2.5- 1.5	72	0.48
1.5 -1.0	9	0.06
< 1.0	11	0.073
Total	150	1

Table 3:*Distribution of Subjects based on Birth weight.*

About 8.7% babies required resuscitation at birth with 2% requiring intubation.

Respiratory distress syndrome was seen in 17.3% babies. NEC stage 2 was seen in one baby.

IVF, Inotropes and antibiotics were required in 34.7%, 5.3% and 38% babies respectively. Neonatal Jaundice was seen in 66.7%. Hypoglycaemia was seen in 3.3% babies (Tables 4 and 5).

Medical Interventions	N	%
Need for IVF	52	0.347
Need for Inotropes	8	0.053
Antibiotics < 5 days	44	0.293
Antibiotics > 5 days	13	0.087
Jaundice requiring Intervention	27	0.18

Table 4:*Distribution of Subjects based on Requirement of Medical Intervention.*

RDS	N	%
No	124	0.827
Oxygen	11	0.073
CPAP	15	0.1
Total	150	1

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

Probable sepsis was seen in 8% babies while culture proven sepsis was seen in 1.3% babies (Table 6).

Sepsis	N	%
No	136	0.907
Probable	12	0.08
Proven	2	0.013
Total	150	1

Table 6*:Distribution of Subjects based on presence of Sepsis.*

Out of the total 150 pre-term babies, 92% survived while 8% expired. Poor outcome in pre-term babies was observed to be associated with primi-mothers and small for gestation age babies. Poor outcome was also associated with RDS, feeding intolerance, presence of sepsis (Table 7).

Outcome	N	%
Survived	138	0.92
Expired	12	0.08
Total	150	1

Table 7:*Distribution of Subjects based on Outcome.*

Discussion

Infants born preterm are vulnerable to many complications, including respiratory distress syndrome, chronic lung disease, injury to the intestines, 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 of all complications [4]. With reference to the 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 premies which was low compared with studies globally. Meta analysis by Fikadu et al showed overal prevalance of 17%. The main reason of low asphyxia in our unit is because of good utilization of different intrapartum fetal monitoring equipment and tools, having qualified professional and quality of care given services to neonates.

Respiratory distress was present in 23% pre-term babies while Respiratory distress syndrome was seen in 17.3% babies. RDS was observed in 17.5% in 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 pre-maturity. In present study, ante-natal steroids were given to 71.4% subjects, hence low RDS [5]. NEC was noted in only one baby which was was born less than 32 weeks of gestation, where mother had not received antenatal steroids and that was a small for gestational age baby. But overall studies shows that premature infants are affected at a prevalence as high as 15% of all infants cared for in the NICU. Low incidence in our unit is due to cautious feeding practices, non usage of formula feeds, and most importantly maximum aseptic precautions. In present study hypoglycemia was seen in 3.3% babies. Selvan et al. observed hypoglycemia in 27.5% pre-term babies compared to 1.6% in term babies. Another study showed that 15% of preterm hypoglycemic infants. 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 [2]. In present study, probable sepsis was seen in 8% babies while culture proven sepsis was seen in 1.3% babies. Sepsis and its clinical implications have been extensively reviewed recently. A meta analysis showed preterm babies were 3.36 more likely to develop neonatal sepsis than term babies. This finding is also in line with studies done in 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 proceudres, indwelling catheters. Therefore, staff training and education about infection prevention is a crucial step to prevent sepsis in NICU. Our study showed neonatal hyperbilirubinemia as the major morbitity in 66%. The higher incidence was seen in study by Wang et al. This is because of developmental immaturity in the liver and feeding difficulties [5]. Out of the total 150 pre-term babies, mortality rate was observed as 8%, much more similar to study done by Zullini et al., with mortality rate of 5.9% [4].

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 quality of outcome of premature babies.

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