



Original Research Article

A COMPARATIVE STUDY ON MORBIDITY AND MORTALITY PROFILE AMONG PRETERM AND TERM NEONATES AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Neonatal health is the key to child survival. Neonatal mortality in India in 2020 was 20.3/1000 live births. Three fourths of these deaths occur in first week of life. Prematurity and LBW, neonatal infections, birth asphyxia and birth trauma account for 78% of all neonatal deaths in India¹. Present study was done to know the mortality and morbidity profile of new-borns in NICU of KGH, Visakhapatnam. This knowledge helps in identifying gaps in care practices and improve quality of care in health care facilities. **Aims & Objectives:** To study and compare the morbidity profile in term and preterm neonates. To evaluate the various causes of mortality in preterm and term neonates

Materials and Methods: It is a hospital based prospective observational study. A total of 400 neonates, of them 200 preterm and 200 term babies were enrolled in the study. Maternal details, neonatal details, physical examination, investigations, various morbidities and final outcome were noted in a structured predefined proforma.

Results: From this study, among preterm neonates most common causes of mortality were Sepsis(12%),RDS(11.5%),Birth asphyxia (3.5%),DIC (1%) and IVH (0.5%).Among term neonates mortality causes were Birth asphyxia(2.5%), Sepsis (2%),MAS(1.5%), Aspiration pneumonia (1%) and DIC (0.5%).Most common morbidity among preterm neonates were NNJ, RDS, Sepsis, NEC, Hypothermia, Apnea, Hypoglycaemia, Hypocalcemia, Birth asphyxia, Congenital heart diseases & among term neonates causes are Sepsis, Birth asphyxia, seizures, MAS,NNJ, Congenital heart disease, hypoglycaemia, hypocalcemia, bleeding manifestations, NEC, hypothermia.

Conclusion: The present study concluded that, High risk pregnancy must be identified in the antenatal period and must be referred to appropriate centre for skilled management.

Keywords: Preterm neonates, Seizures, Hypothermia, Morbidity, Mortality.

INTRODUCTION

Neonatal health is the key to child survival. Neonatal period carries the highest risk of mortality per day than any other period during the entire childhood. Neonatal mortality in India in 2020 was 20.3/1000 live births. Three fourths of these deaths occur in first

week of life. Prematurity and LBW, neonatal infections, birth asphyxia and birth trauma account for 78% of all neonatal deaths in India.^[1]

In India, about 30% of all live births are born with LBW. About 60% of them are born at term after fetal growth restriction while the rest are due to prematurity. It has been estimated that each year,

11% of all deliveries in the world are premature, and one million out of six million child deaths are due to complications of prematurity¹. The global incidence of preterm birth accounts for 12.9 million (9.6%), of which 85% is concentrated in Asia and Africa. This marks the preterm births as a significant perinatal problem across the globe, which is associated with high mortality and short- and long-term morbidity.^[2] Survival of extremely premature infants has increased significantly during the last two decades. Complications of prematurity are becoming more common as more survivors are spending time in Neonatal intensive care unit (NICU). Quality of care has a significant influence on the survival of preterm and LBW infants. In developed countries, continued improvement in the quality of care has resulted in improvement in infant survival rates for these infants. In India also with establishment of SNCU in all the districts across the country and implementation of INAP, there is significant improvement in mortality and morbidity of newborns especially among preterm babies of gestational age more than 28 weeks. The present study was undertaken to evaluate the morbidity and mortality of new born babies admitted in NICU of a tertiary care centre and compare the morbidity and mortality of preterm to that of term neonates. Based on this information, further measures can be undertaken as this data is essential for planning and improvement of perinatal and neonatal services based on local needs to reach the goal of single digit neonatal mortality rate of INAP by 2030.

MATERIAL AND METHODS

The present study is a hospital based observational study conducted in NICU over a period of 1 year in 2022 in King George Hospital, Visakhapatnam. A total of 400 neonates, of them 200 preterm and 200 term babies were enrolled in the study.

Inclusion Criteria

- 200 Preterm neonates admitted in NICU.
- 200 term neonates admitted in NICU.

Exclusion Criteria

- Neonates with major congenital anomalies.
- Neonates with chromosomal anomalies.
- Those who expire within 24 hours of admission.
- Out born babies who came late after receiving treatment outside.

Methodology

Sample size of total 400 neonates were enrolled in the study, of them 200 preterm neonates and 200 term neonates who met the inclusion criteria were enrolled in the study. Neonates were chosen for enrolment by simple randomisation method.

Structured proforma was used to enter the details of the included babies. Maternal details like Age, parity, and antenatal steroids (in case of preterm delivery, mode of delivery, history of risk factors like PIH,

GDM, oligohydramnios, Urinary tract infection, anaemia, multiple pregnancies etc were noted.

All babies demographic and clinical details like age, sex, gestational age, birth weight, resuscitation, history of birth asphyxia were taken. Detailed physical examination was done. Babies were followed through their hospital stay and any complications like jaundice, RDS, Apnoea, NEC, IVH, HIE, Sepsis, MAS etc. were noted. Feeding details and treatment details noted. Investigations like complete blood picture, complete hemogram, blood glucose levels, serum electrolytes, chest X ray, ultra sound, neuro-sonogram, CT scan, MRI etc was done as per requirement. All these details will be tabulated and statistical analysis will be done using SPSS method.

RESULTS

There were 2946 Admissions in NICU during study period of 1 year, out of these 200 preterm and 200 term babies were included in the study by simple randomisation.

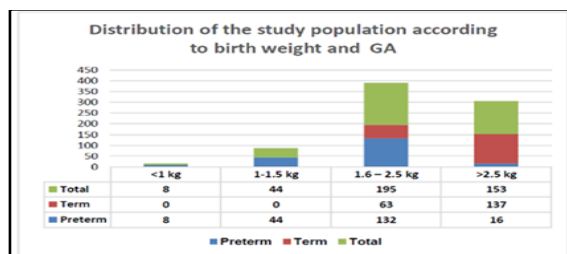


Figure 1: Distribution of the study population according to birth weight and GA

The mean birth weight of preterm was 1.89+0.44 kgs and term was 2.9+0.58.

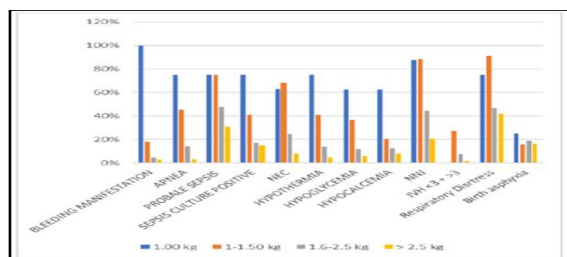


Figure 2: Morbidity profile according to birth weight in the study population

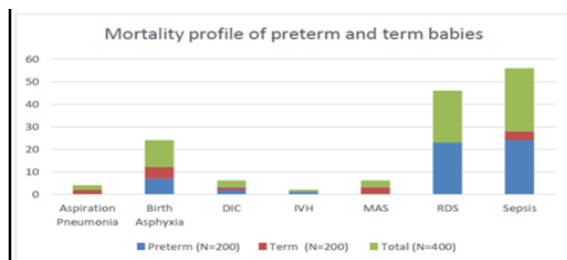


Figure 3: Morbidity profile of preterm and term babies

Table 1: Distribution of the study population according to birth weight and GA

Birth weight	Preterm (N=200)	Term (N=200)	Total (N=400)	X ² , Pvalue
<1 kg	8	0	8	5.56, P=0.01
1-1.5 kg	44	0	44	46.2, P<0.001
1.6 – 2.5 kg	132	63	195	47.6, P<0.001
>2.5 kg	16	137	153	154.9, P<0.001

Table 2: Incidence of various morbidities among three groups of preterm Neonates

MORBIDITY	28-31 weeks	32-33 weeks	34-36 weeks	X ² ,P Value
BLEEDING MANIFESTATION	10	3	3	19.04,p<0.001
APNEA	26	8	20	31.73,p<0.001
PROBABLE SEPSIS	36	15	63	14.9,p<0.001
NEC	27	11	35	17.6,p<0.001
HYPOTHERMIA	21	7	29	10.09,p<0.001
HYPOGLYCEMIA	14	8	22	6.55,p=0.03
HYPOCALCEMIA	14	8	21	7.31,p=0.025
NNJ	41	21	97	8.61,p=0.013
IVH<3+>3	12	7	7	20.5,p<0.001
RDS	39	15	65	119.8,p<0.001
Birth _asphyxia	11	5	18	3.19,p=0.21

Table 3: Morbidity profile of preterm and term babies

Causes of death	Preterm (N=200)	Term (N=200)	Total (N=400)	X ² and p value
Aspiration Pneumonia	0	2	2	0.33, P=0.56
Birth Asphyxia	7	5	12	0.34, P=0.55
DIC	2	1	3	0.33, P=0.56
IVH	1	0	1	0, P=1
MAS	0	3	3	1.01, P=0.31
RDS	23	0	23	21.45,P<0.001
Sepsis	24	4	28	15.3, P<0.001

Table 4: Distribution of the outcome of the term and preterm babies

Outcome of the baby	Preterm (N=200)	Term (N=200)	Total (N=400)	X ² and p value
Death	56	15	71	28.78
Discharge	144	185	329	P <0.001

DISCUSSION

In the present study risk factors, morbidity and mortality profile of 200 preterm and 200 term babies was studied.

Most common risk factors for preterm delivery were PROM (22%) followed by oligohydramnios (14%), PIH (11.5%) and anaemia (8.5%). And among term babies most common maternal risk factors were oligohydramnios (3%) followed by anaemia (2%), PIH (2%). In developing country like India most of the maternal risk factors leading to preterm delivery and birth asphyxia are modifiable and preventable with high quality of antenatal care by skilled health workers by including proper counselling of expectant mothers about nutrition especially Iron and folic acid supplementation.^[1]

Most common morbidity among preterm babies were RDS (60%) followed by probable sepsis (57%), NEC (46.5%). And among term babies were probable sepsis (33%) followed by Birth asphyxia (18.5%), MAS (15.5%).

Among preterm baby's Antenatal steroid coverage was low, given only in 45%. Antenatal steroid has established role in reducing Preterm morbidity due to RDS, IVH, NEC and in improving the overall survival of preterm babies. There is urgent need to increase the use of ANS before preterm delivery, even before they are referred to tertiary care centres. Birth Asphyxia incidence was very high in both preterm (17%) and term babies (18.5%). Intra uterine transfer of expectant mothers to centres well equipped for antepartum and intrapartum care can significantly reduce the morbidity and mortality due to Birth asphyxia. Overall mortality among preterm was 28% and among term babies was 7.5%. Most common cause of mortality among preterm neonates were sepsis 12% followed by RDS 11.5%, birth asphyxia 3.5%, DIC 1% and IVH 0.5% and among term neonates most common cause of mortality were birth asphyxia 2.5%, sepsis 2%, MAS 1.5%, aspiration pneumonia 1% and DIC 0.5%.

Mortality due to sepsis among preterm and term babies was 12% and 2% respectively, hence strict aseptic procedures, hand hygiene, judicious use of antibiotics should be done.

In general risk of morbidity and mortality and long term sequelae are inversely related to GA. Very preterm have higher morbidity and mortality compared to moderate and late preterm. However, in the present study morbidity and mortality among three groups were nearly same and there was no statistical significance. Lesser gestational age usually requires more care, more equipment and more resources than higher gestational age group. With minimal equipment, less expenditure, less resources and little extra care morbidity and mortality outcomes in moderate and late preterm group can be improved significantly.

In the study done by Olugbenga Ayodeji Mokuolu et al,^[3] on neonatal morbidity and mortality in Nigeria showed that causes of morbidity among preterm

babies were Birth asphyxia 24.00%, neonatal sepsis 19.00%, RDS 17.00%, hyperbilirubinemia 10.00%, anaemia of prematurity 4.00%, IVH 2.00%. Morbidity among term babies were birth asphyxia 35.00%, hyperbilirubinemia 18.00%, neonatal sepsis 16.00%, respiratory distress 13.00%, congenital malformation 7.00%, macrosomia 2.00% and others 9.00%.^[3]

In the study done by Siyuan Jiang et al,^[4] on mortality and morbidity among preterm babies showed that causes of morbidity were sepsis 14.00%, NEC 3.00%, IVH 7.00%, BPD 9.00%.^[4]

In the study done by Lulu M Muhe et al⁵ on major causes of death in preterm infants showed that among 28-31 weeks primary causes of death were RDS 52.6%, sepsis 41.9%, Birth asphyxia 43.7%, IVH 41.7%, apnoea 45.8%, NEC 22.2%. Among 32 to 34 weeks, NEC 55.6%, IVH 50%, sepsis 34.3%, RDS 29.9%, Birth asphyxia 28.5% and apnoea 25%. Among 35 to 36 weeks NEC 22.2%, sepsis 18.7%, Birth asphyxia 18.5%, IVH 8.3% and apnoea 6.3%.^[5]

CONCLUSION

High risk pregnancy must be identified in the antenatal period and must be referred to appropriate centre for skilled management. Several interventions including improvements in quality of prenatal, intrapartum and post-natal care, encouraging institutional delivery, timely administration of antenatal steroids, practising hand hygiene, strict aseptic procedures, implementation of KMC in LBW babies are essential to improve the outcome of both preterm and term babies and achieve the goal of single digit NMR of INAP.

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Conflict of interest

None.

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