

Original Research Article

A study of morbidity and mortality profile among preterms suffering from Hyaline Membrane Disease in a tertiary care hospital in Cuttack, India

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ABSTRACT

Background: Every newborn carries within itself immense possibility to transform into a complete healthy human being and fulfill the needs the future will demand. Of the problems of premature baby, respiratory causes are the commonest admission to NICU. The common respiratory problem encountered is Respiratory distress syndrome (RDS) also known as Hyaline membrane disease (HMD), whose incidence increases as babies are born early. The objective of the study was to assess the morbidity and mortality profile among preterms suffering from Hyaline membrane disease in a tertiary care hospital in Cuttack.

Methods: A prospective comparative study was conducted in the neonatal intensive care unit of SVPPGIP Hospital attached to the SCB Medical College, Department of Pediatrics, Cuttack from September 2010 to September 2012. A total of 103 preterm newborn with Hyaline membrane disease were included in the study.

Results: Out of 103, 67 male and 36 females were included in the study.

The total neonatal death in our study was 44 (42.7%) pre-term out of 103 subjects. The death of neonate within 1st week or 168 hrs of age of birth irrespective of cause was considered for early neonatal death which was 21 (47.7%) of the total neonatal death.

Conclusions: It may be worth considering surfactant replacement therapy in neonates between with RDS 30-33 weeks gestation in level III care setup in our country even being referred late but less than 24 hrs of age with supportive and aseptic care.

Keywords: Mortality, Morbidity, Preterm, RDS, Surfactant

INTRODUCTION

Health is defined as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.¹ Respiratory distress is a clinical condition characterized by the presence of one or more signs of increased work of breathing including; tachypnea, nasal flaring, grunting, and chest wall

retractions.² The main risk factor for RDS by far, is prematurity; Other factors that increase the risk of RDS include perinatal asphyxia, maternal diabetes, lack of labor, absence of antenatal steroid administration to the mother, male gender, and White race.²

Several risk factors for RDS have been identified. Multivariate regression analysis of maternal and perinatal

data demonstrated that gestational age, birth-weight, maternal age, elective and emergency caesarean section (CS), and male sex were risk factors for RDS (Dani 1999). Most importantly, the incidence of RDS increases with decreasing gestational age and birth weight (Chard 1997).^{2,3}

Pulmonary surfactant is a complex mixture of phospholipids, neutral lipids, and proteins that is synthesized, packaged, and secreted by alveolar type 2 cells. Storage of surfactant occurs in the lamellar body, a lysosome-derived membrane-bound organelle that undergoes regulated secretion in response to a variety of stimuli, including stretching.⁴

Phospholipid and protein components are recycled out of the surfactant monolayer at the air-liquid interface and taken back into the alveolar type 2 cell, where they can be repackaged into lamellar bodies. Alternatively, alveolar macrophages are able to engulf and degrade surfactant components.^{4,5}

Hence this study is done to analyse the mortality and morbidity among the preterm newborn in a tertiary care hospital.

The objective of the study was to assess the morbidity and mortality profile among preterm suffering from Hayaline membrane disease in a tertiary care hospital in Cuttack.

METHODS

A prospective comparative Study was conducted in the neonatal intensive care unit of SVPPGIP Hospital attached to the SCB Medical College, Department of Pediatrics, Cuttack from September 2010 to September 2012.

A total of 103 pre-mature infants suffering from Hyaline Membrane Disease were born during the study period in the hospital. Case selection being premature baby with clinical sign and symptoms of RDS with X-ray features suggestive of RDS at presentation in NICU after eliminating other possible differential diagnosis of respiratory distress including respiratory tract congenital anomaly, birth asphyxia, congenital malformation, infection, Cardiovascular causes.

All the cases were Stabilized and admitted in the NICU with supportive management, a working diagnosis of RDS made while assessing severity and prognosis by clinical history, examination, X-ray finding, ABG, requirement of mechanical ventilator support simultaneously excluding alternative diagnosis.

In the meantime, antenatal history focusing h/o PROM, dose of steroid taken, cause for prematurity, previous pregnancy and post-natal events and clinical examination with maturational assessment of gestational age

assessment by New Ballard scorings done and noted down in predesigned proforma. All babies were put on NPO, fluids as per weight and day basis, under coverage of broad spectrum antibiotic ampicillin and gentamycin with other essential drug on individual clinical condition basis.

RESULTS

In present study total there were 103 premature babies all with RDS of ≤ 34 week needing and /or on ventilator support were included in the study. Out of 103, 67 male and 36 females were included in the study.

Table 1: Profile of Mothers and Preterm.

Observation	Total no of subjects	%
Complete steroid Course of Mother before delivery	41	39.8
% of mother booked in antenatal period	77	74.7
PROM >18 hrs before delivery	29	28.1
Cesarean delivery	22	21.3
Mean Birth Weight in gm	1260.3	

Complete Steroid course of two doses of 12 mg Betamethasone was given 24 hrs apart in 41(39.8%) of the mothers. Out of 103 mothers 77 (74.7%) of them were booked antenatal cases.

29 (28.1%) of the mother had a history of Premature Rupture of Members for more than 18 hours duration. 21.3% of the study participants were delivered through Cesarean section. The mean weight of preterm babies in our study was 1260.3 gm (Table 1).

Table 2: Mortality profile of the preterm Newborns.

Mortality	No. of preterms	%
Total neonatal death	44	42.7
Early neonate death	21/44	47.7
Late neonatal death	23/44	52.3

The total neonatal death in present study was 44 (42.7%) preterm out of 103 subjects. The death of neonate within 1st week or 168hrs of age of birth irrespective of cause was considered for early neonatal death which was 21 (47.7%) of the total neonatal death.

Late neonate death was Death of neonate after 168 hrs of life (7 days) to within completed 28 days of life irrespective of cause was 23 (52.3%) in present study (Table 2).

Sepsis was the most common reason for mortality among both the early and late neonatal death. Among early neonatal death Air leak was the next common cause of

mortality. In late neonatal death pneumonia was the second most common cause of mortality (Table 3).

Table 3: Causes of the death among preterm newborn.

Causes of mortality	Early neonatal death (n=21)	Late neonatal death (n=23)
RDS	2 (9.5%)	0 (0%)
Air leak	3 (14.3%)	1 (4.3%)
IVH	2 (9.5%)	0 (0%)
Sepsis	12 (57.1%)	14 (60.8%)
Pneumonia	0 (0%)	6 (26.1%)
Others	2 (9.5%)	2 (8.7%)

Table 4: Morbidity profile of babies who survived in each group.

Observation	Survived preterm (n=59)
Mean duration of ventilation in days	4.28±1.65
Mean duration of ICU stay in days	9.59±2.67
Mean duration of hospital stay in days	22.02±6.16

Table 5: Causes of morbidity of babies who survived in each group.

Observation	Survived preterm (n=59)
Sepsis	39 (66.1%)
Pneumonia	31 (52.5%)
PDA	9 (15.3%)
IVH	4 (6.7%)
NEC	10 (16.9%)
CLD	4 (6.7%)
Others (Including ROP, PPHN, etc.)	10 (16.9%)

Among the survived preterm neonates Sepsis (66.1%) and Pneumonia (52.5%) were the most common causes of the morbidity in present study (Table 5).

DISCUSSION

The incidence of HMD is reported to be 6.8-14.1% of preterm live births in our country.^{6,7} RDS formed 13.5% of total neonatal deaths.⁷ It affects 60-80% of babies born before 28 weeks, 50% of born between 28-32 weeks and 15-30% born between 32-36 weeks and 10% of born between 33-34 weeks.^{8,9}

In present study the total neonatal mortality was 44.7% which is almost similar to the findings of the other studies done by Soll RF et al and Bhutta et al.^{10,11}

The early neonatal mortality in present study was 47.7%, which was higher when compared to the study done by

Narang et al (31.85%).¹² In the study done by Femitha et al the mortality rate was 38.7% which was also lesser when compared to our study.¹³ The study done by Bae et al also reported lesser mortality rate than present study.¹⁴

Overall major cause for mortality was sepsis, which was more in our study than Narang et al there it contributed 49% to neonatal death.¹² Bhakoo et al opined sepsis is the commonest complication in ventilated babies, as high as 67% incidence has been reported.¹⁵ Bae et al in his 2 study in Korea found sepsis is major factor of mortality 42.6% in 1996 and 47.4%.¹⁶ Occurrence of infection is directly related to the duration of ventilation and duration of hospital stay.

Jobe et al concluded that antenatal corticosteroid therapy in threatened premature labor combined with the use of postnatal rescue surfactant is associated with a decreased incidence of RDS and may be beneficial for reducing the severity of RDS and improving the eventual outcome of VLBW infants.¹⁷

CONCLUSION

It may be worth considering surfactant replacement therapy in neonates between with RDS 30-33 weeks gestation in level III care setup in our country even being referred late but less than 24 hrs of age with supportive and aseptic care. This can help in reducing the mortality and morbidity among the preterm.

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