

Clinico-Etiological Profile and Outcome of Neonatal Respiratory Distress in Tertiary Care Hospital, Guntur

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ABSTRACT

Introduction: Respiratory distress (RD) is a common cause of admission in the neonatal unit. Early recognition of RD and initiation of appropriate treatment is important to ensure optimal outcomes. RD is one of the most common causes of morbidity in newborn. Aim of the present research was to study clinical profile of neonatal respiratory distress (RD), to find out most common etiology of respiratory distress in newborn and to assess the immediate clinical outcome of RD in our neonatal intensive care unit (NICU).

Material and Methods: A prospective study was conducted at Tertiary Care Hospital, Guntur from May 2019 to October 2019 and study includes 200 cases. Term, pre-term and post-term babies both in-born and out-born cases were included in the study.

Results: The study showed among the 720 newborns admitted in NICU, 200 (28 %) cases were admitted with Respiratory distress. Of them, 116 babies (58%) were delivered vaginally and 84 (42%) by lower segment caesarean section. There were 122 (61%) pre-term babies, 68 (34%) term and 10 (5%) post-term neonates who were admitted with respiratory distress. The majority of cases were clinically presented with tachypnea, flaring of alae nasi, and chest indrawing. The respiratory distress resolved on the 4th day in majority of cases.

Conclusion: Respiratory Distress is one of the commonest cause of NICU admissions. Transient tachypnea of the newborn is the most common cause of respiratory distress in term babies whereas Hyaline membrane disease is common in preterm babies. The survival rate was 90% among RD cases admitted to NICU.

Keywords: Apnea, Hyaline Membrane Disease, Neonatal Respiratory Distress, Transient Tachypnea of Newborn

INTRODUCTION

Respiratory Distress is one of the commonest cause of NICU admissions. Certain risk factors increase the likelihood of neonatal respiratory disease. These factors include prematurity, meconium-stained amniotic fluid (MSAF), caesarean section delivery, gestational diabetes, maternal chorio amnionitis, or prenatal ultrasonographic findings, such as oligohydramnios or structural lung abnormalities. Regardless of the cause, if not recognized and managed quickly, respiratory distress can escalate to respiratory failure and cardiopulmonary arrest.

Clinical presentation of respiratory distress in newborn include one or more of the following features respiratory rate of ≥ 60 /min, apnea, retractions (sub costal, inter costal, xiphoid, suprasternal), grunting, nasal flaring, cyanosis. It

occurs in 5-10% of live births and is responsible for about 20% of neonatal mortality.^{1,2} A variety of disorders of respiratory system like Transient tachypnea of the newborn, Hyaline membrane disease, Meconium aspiration syndrome, Pneumonia, Septicemia, Persistent pulmonary hypertension and Non respiratory disorders like Cardiac, Neurological, Infectious, Metabolic disorders and Congenital anomalies can cause respiratory distress. Commonest cause of respiratory distress in term babies is Transient tachypnea of new born whereas in preterm babies it is Hyaline membrane disease.^{1,2} Continued efforts in prevention of Premature birth, early recognition of fetal distress, identification of maternal risk factors and diagnosis of diseases in utero will further improve neonatal outcome.

Early recognition and appropriate therapy of neonatal respiratory disease has impressive results. Though treatment is disease specific, common modalities of treatment include Resuscitation, Oxygenation, Surfactant replacement, Ventilation. Introduction of Continuous Positive Air way Pressure and Ventilators have revolutionized the outcome of respiratory failure in neonates.

MATERIAL AND METHODS

This was an observational prospective study conducted in the NICU of Government General Hospital, Guntur a tertiary care hospital. The study was carried out from May 2019 to October 2019 after obtaining Institutional Ethics Committee approval. All Inborn and Out born Neonates with RD were enrolled in the study after obtaining written informed consent from parents of babies.

Inclusion Criteria

Both in-born and out-born neonates admitted to NICU with RD.

Exclusion Criteria

1. Babies more than 28 days

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2. Babies <28 weeks of Gestational age.

A detailed proforma including name, age, sex, and residence was obtained. Neonatal data was recorded including weight of the baby, gestational age, mode of delivery, APGAR score, if available, the need for resuscitation after birth, onset of RD and resolution of RD. Factors related to labor and deliveries were assessed including type of delivery normal vaginal or Caesarean section, elective or emergency, place of delivery, (any associated complications like; prolonged rupture of the membranes more than 24 h, prolonged labor, meconium stained liquor, antepartum hemorrhage and others). Maternal information was recorded including age, parity and any systemic diseases.

Other risk factors include delivery prior to 37 weeks of gestation, male sex, low birth weight and macrosomia^{3,4} and maternal diseases such gestational diabetes and asthma.

The cases were diagnosed clinically by the presence of at least 2 of the following criteria, namely RR of 60/min or more, subcostal in drawing, and supra sternal in drawing, flaring of alae nasi, expiratory grunt and cyanosis.

The diagnosis of clinical conditions producing respiratory distress (RD) was based mainly on careful scrutiny of the history, clinical and radiological findings.

RESULTS

Of the 200(28%) cases admitted with respiratory distress, 116 babies (58%) were delivered vaginally and 84 babies (42%) by lower segment caesarean section.

There were 104 (52%) males and 96(48%) females in the study. There were 68(34%) term, 122(61%) preterm and 10(5%) post term neonates who were admitted with respiratory distress.

There were 68(34%) babies with birth weight >2.5kg, 104(52%) babies with 2.5 -1.5 kg and 28(14%) babies with

Risk factors	No of cases	Percentage
Prematurity	84	42
Hypertension	44	22
Oligohydramnios	32	16
Pol y hydramnios	6	3
PROM	20	10
Heart disease	2	1
Meconium stained liquor	20	10
Gestational Diabetes	8	4
Maternal fever	12	6

Table-1: Risk factors for RD in newborn

Diagnosis	No of cases	Percentage
RDS	80	40%
TTNB	38	19%
MAS	20	10%
Congenital pneumonia	18	9%
Congenital malformations	6	3%
Congenital heart disease	8	4%
Severe birth asphyxia	24	12%
Others	6	3%

Table-2: Etiology of respiratory distress (RD) in newborn.

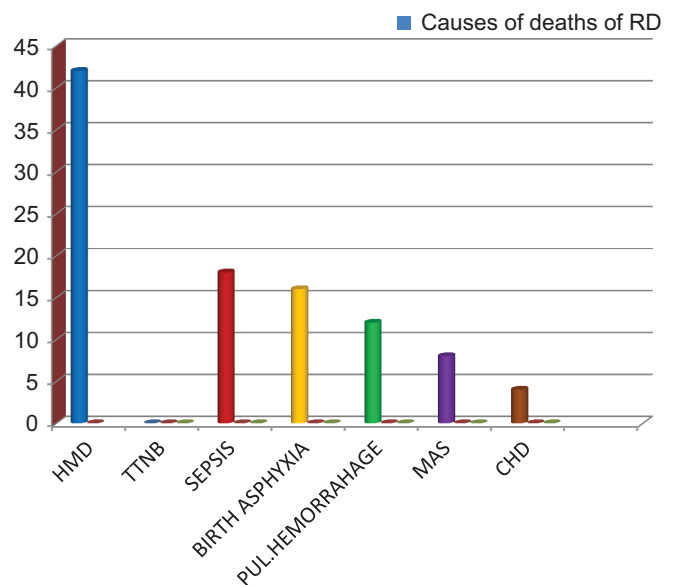


Figure-1: Causes of deaths of RD

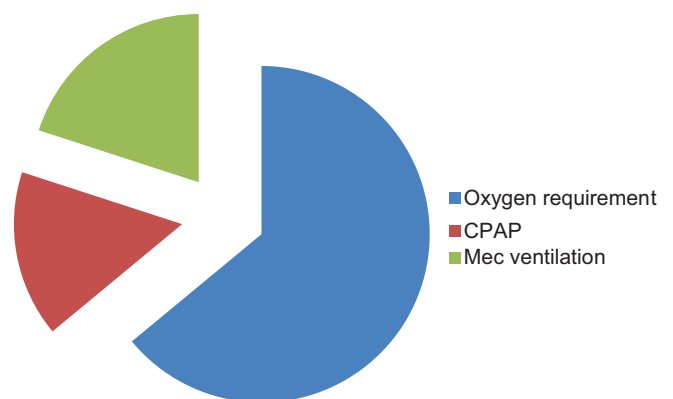


Figure-2: Treatment modality given for RD in newborn

<1.5kg.

Following risk factors were identified, Prematurity is the commonest fetal risk factor (84) and Hypertension (44) was the commonest maternal risk factor noted, followed by oligohydramnios (32), PROM (20), GDM (8) (table-1).

Based on Silver man Anderson and Downe score, mild RD was observed in 34%, moderate 46% and severe in 20% cases.

Most common etiology of respiratory distress (RD) was Hyaline membrane disease (40%) followed by TTNB (19%), MAS(10%), Congenital pneumonia(9%), Congenital malformations (3%), Severe Birth asphyxia (12%), Congenital heart diseases (4%) and others. 31 babies (15.5%) were treated with CPAP and 40 babies (20%) were with mechanical ventilation (table-2).

DISCUSSION

Out of these total 200 cases identified to have respiratory distress, 164 cases were due to Respiratory causes, 28 cases were due to CNS causes and Other 8 cases were due to cardiac causes. Based on Downes and Anderson Silverman score, Mild respiratory distress was observed in 34%, Moderate in 46% and Severe in 20%. In the present study commonest cause of respiratory distress was RDS (40%) followed by

TTNB (19%).

In the present study males (52%) have increased Respiratory Distress compared to females (48%). Similar results were obtained in M Luerti et al⁵ and Herbert C Miller et al.⁶ but there was no significant association of Respiratory Distress with gender was observed in C. Dani et al³ and Nagendra K et al.⁷

In the present study, 40% of cases were Inborn, 60% cases were Out born with increased maternal risk factors associated with increased mortality rate(76%) than Inborn babies (34%) which was similar to study by Kumar et al (68.7%).⁸

58% of cases were born through Normal vaginal delivery and 42% of cases were through caesarean section. Contrary results were obtained in studies by C Dani et al³, EJ Geller et al, Jean Bernard et al, Guyon et al.⁶ The possible reason might be that most of the cases were referred from peripheries where there were no facilities for caesarean section.

In our study 61% cases of respiratory distress were pre-term babies, 34% term and 5% post-term babies. Similar results were obtained by Santhosh et al,⁹ their study showed 39% term and 61% pre-term neonates. Similar increase in incidence in preterm has been reported in study by Mishra and Khatua.^{10,11}

The most common cause of Neonatal respiratory distress in our study were RDS (40%), TTNB (19%), birth asphyxia (12%), MAS (10%), congenital pneumonia (9%), congenital heart disease (4%), Congenital malformations (3%) and others (3%) (fig-1).

Most of NICU admissions were low birth weight babies with gestational age <34 weeks with maternal risk factors and referred babies from other hospitals with HMD. Similar study done by Sarnakar et al¹² the most common causes of RD in their study were TTNB 40.7%, followed by RDS 17.2%, birth asphyxia 11.4% and MAS 9.3%

The majority of cases 162 (81%) presented with increased respiratory rate, chest in drawing and 84 (42%) babies had flaring of alae nasi.

In the present study birth weight of >2.5 kg were 34%, 2.5-1.5kg were 52% and <1.5kg were 14%, severe RD was observed in <1.5 kg (86%).

Similar results were obtained in M Lureti et al⁵ Kwang Sunlee et al¹³, C Dani et al³ and Herbert C Miller et al⁶ where increased Respiratory Distress was observed with decrease in birth weight especially of <1.5 kg.

In the present study Anderson Silverman score of >7 was observed in 24% of preterm babies.

Downes score of > 7 was observed in 18%. Score of > 7 is mostly associated with MAS (58.3%) followed by Pneumonia (24.2%).

All the deaths (100%) in term babies was significantly associated with score of >7.

In the present study 84% had developed RD within 1 hour of life whereas 9% had RD after 6 hours of life. Of these 9% babies half of the babies had Pneumonia and other half had Sepsis. So, babies who had respiratory distress after 6 hours were mainly due to infection.

Most common risk factor observed in our study was

Prematurity (43%), HTN (22%) followed by Oligo hydramnios (16%), Twin pregnancy (2%), Poly hydramnios (3%), Gestational Diabetes Mellitus (4%), PROM(10%). HTN was mostly associated with TTNB (17.4%), MAS (17.4%), Birth asphyxia(17.4%), and Sepsis (17.4%). GDM most commonly associated with TTNB. Oligo hydramnios most commonly associated with TTNB (54.5%) followed by Pneumonia (36.4%) and HMD (9.1%).

PROM was significantly associated with pneumonia (50%) and HMD (50%).

In the present study Pneumonia and Sepsis together constitutes 15% of which C-Reactive Protein was positive in 92.9%, Blood culture was positive in 46.3%, Leucopenia (<4000/cumm) was seen in 42.5%. Near similar results were observed in Kumar et al(8) in which blood culture positivity was seen in 47.6%

Out of 200 cases, 129 babies (64.5%) required oxygen for 2 days, 31 babies (15.5%) had CPAP as modality of treatment. Average duration of CPAP was 3 days. 40 babies (20%) were treated with Mechanical ventilation. Of these 50% were extubated successfully (fig-2).

Study conducted by Ravindra et al¹⁴⁻¹⁶ they observed that the most common causes for mortality were prematurity (42.1%) and RDS. Similar results were observed in our present study. Mortality was 10% and deaths were due to Hyaline membrane disease (42%), Septicemia (18%), Severe birth asphyxia (16%), Pulmonary hemorrhage (12%), MAS (8%) and CHD (4%). Among the deaths 36% were Inborn while 64% were Out born babies, probable cause for high mortality^{17,18} in Out born might be due to delay in referral. Most of deaths were among less than 1.5kg with severe HMD with perinatal asphyxia with sepsis.

CONCLUSIONS

The frequency of respiratory distress among the neonates was high, while mortality was high in neonates with respiratory distress, especially in pre-term and low birth weight neonates. Early diagnosis and management is important for better outcome.

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