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# A STUDY ON ETIOLOGY AND OUTCOME OF NEWBORNS ADMITTED TO NICU WITH RESPIRATORY DISTRESS IN A TERTIARY CARE CENTRE

**Paediatrics**

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## ABSTRACT

**BACKGROUND:** Respiratory distress is one of the most common cause of admission (30- 40%) in Neonatal Intensive Care Unit and accounts for 20% of neonatal mortality in India. Identification of cause of respiratory distress is important for provision of facilities, and thereby achieving reduction in neonatal mortality.

**OBJECTIVES:**

1. To analyze the causes of respiratory distress in newborns admitted to NICU.
2. To observe the outcome of respiratory distress in newborns admitted to NICU.
3. To assess the severity of respiratory distress in newborns admitted to NICU.

**MATERIAL & METHODS:** A Prospective observational study was conducted at Alluri Sitarama Raju Academy of Medical Sciences, Eluru from June 2022 to November 2022 and includes 80 newborns with respiratory distress admitted in NICU. **RESULTS:** Among the 80 newborns with respiratory distress, majority 55% of cases were due to respiratory etiology , 25%cases were due to sepsis. Among the respiratory causes 34 cases were due to HMD (77%), 8 cases were due to TTNB (18%). Out of 80 newborns, 30 had mild, 20 cases had moderate, 30 cases had severe respiratory distress. Out of 80 newborns, 80% are survivors, 20% are non survivors. **CONCLUSION:** In newborns with respiratory distress, respiratory cause is the most common etiology. HMD is the major cause in preterms, TTNB is the most common respiratory etiology in term newborns. Most common cause of death in newborns with respiratory distress is HMD.

## KEYWORDS

HMD (HYALINE MEMBRANE DISEASE), TTNB (TRANSIENT TACHPNOEA OF NEWBORN), MAS (MECONIUM ASPIRATION SYNDROME), NEC(NECROTIZING ENTEROCOLITIS).

## INTRODUCTION

Respiratory distress is one of the most common cause of admission(30-40%) in Neonatal Intensive Care Unit and accounts for 20% of neonatal mortality in India[1].Incidence of respiratory distress varies from 0.7 % to 8.3% of live born babies in India[2]. Babies with respiratory distress are 2-4 times more likely to die than those without respiratory distress [3].

Respiratory distress results from a variety of disorders of respiratory and non-respiratory etiology. The clinical presentation of respiratory distress in the new born includes apnea, cyanosis, grunting, inspiratory stridor, nasal flaring, poor feeding, and tachypnoea (more than 60 breaths in neonate) , intercostal, subcostal and supra sternal retractions[4].

A variety of disorders of respiratory system like Transient Tachypnoea of the Newborn, Hyaline membrane disease, Meconium aspiration syndrome, Pneumonia, Septicemia, Persistent pulmonary hypertension and Non respiratory disorders like Cardiac, Renal, Gastrointestinal, Neurological, Infectious, Metabolic disorders can cause respiratory distress.[5]

Identification of the cause of respiratory distress is important for planning and provision of facilities for these babies and thereby achieving reduction in neonatal mortality. Results of studies on respiratory distress are variable in different centers. At the outset, this study will help us to identify the causes of respiratory distress in our center and determine the strategies to improve the outcomes in these babies.

## OBJECTIVES

1. To analyze the causes of respiratory distress in newborns admitted to NICU.
2. To observe the outcome of respiratory distress in newborns admitted to NICU.
3. To assess the severity of respiratory distress in newborns admitted to NICU.

## MATERIAL & METHODS

**Study Design:** Prospective hospital based observational study.

**Study Area:** The Neonatal Intensive Care Unit, Department of Paediatrics, Alluri SitaRama Raju Academy of Medical Sciences, Malkapuram, Eluru, West Godavari (dist.), Andhra Pradesh.

**Study Period:** June 2022 to November 2022.

**Study Population:** All Newborns with respiratory distress admitted to NICU.

**Sample Size:** Study consisted a total of 80 cases.

**Inclusion Criteria:**

1) All newborns ≤ 28 days admitted in the NICU (inborn / outborn) with clinically identified respiratory distress.

**Exclusion Criteria:**

1) Babies > 28 days of life.
2) Newborns with congenital malformations and syndromic cases.
3) Parents who don't want to participate in study.

**Ethical Consideration:** Institutional Ethical committee permission was taken prior to the commencement of the study.

**Study Tools And Data Collection Procedure:**

Data was collected for all newborns included in the study with respiratory distress according to pre designed proforma. General information, detailed history of mother during her pregnancy and delivery and clinical examination findings in the baby was documented. Time of onset of distress and the severity was assessed by using Downes and Silverman and Anderson clinical scoring and documented as mild, moderate and severe depending on the score. Depending on the history and clinical examination, relevant investigations were sent for final diagnosis.Immediate resuscitative measures were taken, and specific treatment was started and changed according to the course of baby in the hospital. Babies were followed daily till discharge/death to study the outcome.

**Statistical Analysis**

All the variables in the collected data was entered in MS excel and was analyzed by using SPSS ver.20. Results were displayed in the form of tables and graphs. Chi square test and unpaired T test were applied wherever required to know the significance. A p-value <0.05 was considered as statistically significant.

## OBSERVATIONS & RESULTS:

**Table 1: Distribution Of Babies Based On Etiology Of Respiratory Distress:**

| Etiology | Frequency | Percentage (%) |
|---|---|---|
| Respiratory | 42 | 52.5% |
| Cardiac | 6 | 7.5% |
| Others | 32 | 40% |

In our study, 52.5% (42) majority of the newborns with respiratory distress had respiratory etiology, 7.5% (6) of study subjects had cardiac etiology.

### Gender Wise Distribution Of Newborns With Respiratory Distress:

Out of 80 newborns with respiratory distress, majority 52.5% of the newborns belongs to male gender.

### Distribution Of Babies As Per Gestation

In our study out of 80 newborns, only 37.5%% (30) were in term gestation but majority i.e 62.5% (50) were in preterm gestational group.

### Distribution Based On Etiology Of Respiratory Distress In Preterms.

In the present study, majority 64% of preterms with respiratory distress were due to HMD, followed by 20% of cases were due to sepsis, 12% of cases were due to cardiac causes.

### Distribution Based On Etiology Of Respiratory Distress In Terms:

In the present study, majority 46.5% of term newborns with respiratory distress were due to sepsis, 26.5% of term newborns with respiratory distress were due to TTNB, 20% of term newborns with respiratory distress were due to birth asphyxia, followed by 7% of cases were due to MAS.

**Table 2: Distribution Of Newborns Based On Diagnosis**

| Diagnosis | Frequency | Percentage |
|---|---|---|
| Ttnb | 8 | 10% |
| Hmd | 32 | 40% |
| Mas | 2 | 2.5% |
| Sepsis | 24 | 30% |
| Birth Asphyxia | 6 | 7.5% |
| Cardiac | 6 | 7.5% |
| Nec | 2 | 2.5% |

Out of 80 newborns with respiratory distress, 40% of newborns were due to HMD, followed by 30% of newborns were due to sepsis, 10% of newborns with respiratory distress were due to TTNB.

### Severity Of Respiratory Distress:

37.5% of study subjects had severe respiratory distress, 37.5% of study subjects had mild respiratory distress, 25% had moderate respiratory distress.

**Table 3: Distribution Of Newborns Based On Immediate Final Outcome:**

| Outcome | No. | Percentage (%) |
|---|---|---|
| Discharged | 64 | 80 |
| Death | 16 | 20 |

Out of 80 newborns with respiratory distress, 80% were survivors, 20% were non survivors.

### Distribution Of Newborns Based On Cause Of Mortality:

In the present study, 75% of deaths were due to HMD, followed by 12.5% of deaths were due to sepsis, 12.5% of deaths were due to cardiac causes.

## DISCUSSION

The present study is a prospective observational study, in which the etiology and immediate outcome of newborns with respiratory distress in NICU was evaluated. The current study revealed that most cases of respiratory distress in newborns is due to respiratory etiology (52.5%). In a study by Chandrasekhar R et al, 98% of cases were due to Respiratory etiology[6].

It was noted that in our study overall most common cause of respiratory distress in newborns is HMD(40%). A study conducted by Rakholia et al in 2014 also reported similar pattern[7]. It was in contrast to the study conducted by SM Barkiya et al in which they reported that TTNB is the most common cause of respiratory distress in newborns[8].

Our study observed that among the respiratory causes HMD is the major cause in preterms and TTNB is the most common respiratory etiology in term newborns. It was similar to study conducted by Zaman S et al [9].

In our study male preponderance was 47.5% and female preponderance was 52.5% and 37.5% newborns had severe respiratory distress, 25% had moderate respiratory distress and 37.5% had mild respiratory distress. This coincides with the study conducted by Vinayak et al in 2019[10] and in contrast to the study conducted by Ramkesh Meena et al where male preponderance was 59.8%[11].

In the present study the incidence of respiratory distress is more in preterm babies (62.5%) compared to terms (37.5%). In study done by Santosh S et al showed that preterm babies constitued 55.6% of cases.[12].

The current study revealed a mortality rate of 20% in newborns with respiratory distress. Ankush kommawar et al, study showed a mortality rate of 21.5% in newborns with respiratory distress[13]. In another study by Palod PH et al., revealed a mortality rate of 12.5% in newborns with respiratory distress[14].

The current study revealed that HMD is the overall most common cause of mortality which constitutes 75% and it was similar to study conducted by Fadhil et all which showed that 67.1% of cases of mortality were due to HMD/RDS[15].

## CONCLUSION

Respiratory distress is one of the commonest causes of NICU admissions. In newborns with respiratory distress, respiratory cause is the most common etiology. Overall most common cause of respiratory distress in newborns is HMD. Among the respiratory causes HMD is the major cause in preterm babies and TTNB is the most common respiratory etiology in term newborns. Incidence of respiratory distress is more in females when compared to males and more in preterm babies when compared to term newborns. Newborns with respiratory distress had a survival rate of 80% and mortality rate is 20%. Most common cause of death in newborns with respiratory distress is HMD.

## LIMITATIONS

- Single centre study.
- Study was done in tertiary care hospital.
- Relatively smaller sample size.

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