

Research Article**A****PROSPECTIVE STUDY OF AETIOLOGY AND PREVALENCE OF
RESPIRATORY DISTRESS IN NEWBORNS DELIVERED AT TERTIARY
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06-November-2025****Abstract**

Introduction: Neonatal respiratory distress (RD) is a respiratory condition in newborn which occurs immediately after delivery or within few hours after birth. Preterm infants are more vulnerable to RDS, as compared to term infants. NICU hospitalization is often necessary for newborns experiencing RD.¹ Approximately 15% of full-term infants and 29% of preterm infants experience respiratory complications during NICU and the incidence is more in infants delivered before 34 weeks of gestation. Previous reports showed an incidence rate of 2.42% for neonates who had developed Neonatal respiratory distress. Respiratory Distress Syndrome in neonates is mainly due to decreased production of surfactant or inactivation of surfactant as a result of immature lungs.

Materials and methods: This Was A Prospective Study of 150 Newborns Admitted To NICU With RD In Department of Pediatrics, Singareni Institute of Medical Sciences, Ramagundam For A Period Of One Year From August 2024 To July 2025. Neonates admitted to the Department of Pediatrics, Singareni Institute of Medical Sciences, Ramagundam within 72 hours of birth due to RD were included in the study. Neonates in NICU presented with RD after 72 hours of birth and newborn admitted to NICU delivered at other hospital were excluded from the study. Method of collection of data Information was gathered for every newborn that was part of the trial and had RD. Documentation was made regarding general information, socioeconomic level, historical background, and clinical examination findings of both the mother and the newborn.

Results: The demographic and clinical characteristic of the neonates were shown in Table 1. The incidence of RD was higher in male babies (69.3%) and babies delivered through caesarean section (68%). Majority of the babies were born to full term mothers (56%) and the major

symptoms was tachypnoea (94.6%). The onset of RD within 24 hours was 74.7% of the neonates. The severity of RD based on Silverman-Anderson and Downe's scoring was shown in Table 2. In this the RD severity was moderate in majority of the neonates encompassing 61.3%, mild in 32% and severe in 6.7% respectively.

Conclusion: Transient tachypnoea of new-born is the most common etiology for RD and neonatal sepsis accounts for mortality in the present study. The neonates well responded to oxygen therapy and early intervention is important to prevent mortality.

Key Words: Neonatal respiratory distress syndrome, NICU, Neonates, mortality.

INTRODUCTION

Neonatal respiratory distress syndrome (RDS) is a RD condition in newborn which occurs immediately after delivery or within few hours after birth. Preterm infants are more vulnerable to RDS, as compared to term infants. NICU hospitalization is often necessary for newborns experiencing RD.¹ Approximately 15% of full-term infants and 29% of preterm infants experience respiratory complications during NICU and the incidence is more in infants delivered before 34 weeks of gestation. Previous reports showed an incidence rate of 2.42% for neonates who had developed RDS. RD in neonates is mainly due to decreased production of surfactants or inactivation of surfactant as a result of immature lungs.²

The major risk for neonatal RD in developing countries includes premature babies, low Apgar scores at 1 and 5 minutes, meconium stained liquor, caesarean delivery, preeclampsia, gestational diabetes, premature delivery, oligohydramnios and structural anomalies in lungs.³ The other factors includes transient tachypnoea of the newborn (TTN), neonatal sepsis, pneumonia, hyaline membrane disease and persistent pulmonary hypertension of the newborn. The other causes of RD include metabolic disturbances like hyperthermia, hypothermia, low blood glucose, cardiac anomalies, metabolic anomalies and inborn errors of metabolism.⁴

Management strategies like antenatal corticosteroids, surfactants and advanced respiratory support have improved the outcome in RD neonates but still the morbidity and mortality due to RD is still on rise. Ventilators have enhanced the RD outcome in neonates. In earlier stage, the therapy was to deliver high concentration of oxygen. But the novel therapies aimed to mitigate the physiological abnormalities of immature lungs and thus prevent adverse effect of oxygen and positive pressure ventilator support. The purpose of this study was to evaluate the different risk variables linked to the occurrence of severe RD in newborns, as well as to evaluate the immediate clinical consequences of RD in newborns.⁵

MATERIALS AND METHODS

This Was A Prospective Study of 150 Newborns Admitted To NICU With RD In Department of Pediatrics, Singareni Institute of Medical Sciences, Ramagundam For A Period Of One Year From August 2024 To July 2025.

Inclusion criteria: Neonates admitted to the Department of Pediatrics, Singareni Institute of Medical Sciences, Ramagundam within 72 hours of birth due to RD.

Exclusion criteria: Neonates in NICU after 72 hours of RD and newborn admitted to NICU delivered at other hospital were excluded from the study.

Method of collection of data Information was gathered for every newborn that was part of the trial and had RD. Documentation was made regarding general information, socioeconomic level, historical background, and clinical examination findings of both the mother and the newborn. Infants experiencing difficulty breathing were sent to the NICU for additional treatment and care. The time at which the distress began was recorded, and the intensity of the distress was measured and evaluated using Downe's clinical rating system. Serial radiographs were performed at one hour and six hours of age on all neonates and were evaluated by the radiologist for any abnormal findings. Appropriate examinations were conducted and neonates were handled according to the procedure based on a clinical diagnosis of RD. The study recorded the length of time O₂therapy was administered, as well as the specific interventions used such as surgical procedures, ventilator support, surfactant therapy, or other treatments. The primary focus was to evaluate the clinical result in relation to the final diagnosis, including mortality rates.

Statistical Analysis: Descriptive analysis was used. The data were shown as frequency and percentage. Chi square test was used to study the association between the variables. A $p < 0.05$ was found to be significant. SPSS version 24 was used for the analysis.

RESULTS

The demographic and clinical characteristic of the neonates were shown in Table 1. The incidence of RD was higher in male babies (69.3%) and babies delivered through caesarean section (68%). Majority of the babies were born to full term mothers (56%) and the major symptoms was tachypnoea (94.6%). The onset of RD was 24 hours in 74.7% of the neonates.

Variables	N (%)
Gender	
Male	104(69.3)
Female	46 (30.7)
Gestational Age	
Full term	84 (56)
Pre term	66 (44)
Mode of delivery	
Lower segment caesarean section	102 (68)

Vaginal delivery	48 (32)
Symptoms	
Tachypnoea(>60/min)	142 (94.6)
Nasal flaring	130 (86.6)
Subcostal and intercostals retractions	124 (82.6)
Grunting	120 (80)
Cyanosis	136 (90.6)
Onset of RD	
24 hours	112 (74.7)
42 hours	28 (18.7)
72 hours	10 (6.6)

Table 1: Demographics and clinical characteristic of neonates

The severity of RD based on SA and Downe's scoring was shown in Table 2. In this the RD severity was moderate in majority of the neonates encompassing 61.3%, mild in 32% and severe in 6.7% respectively.

RD severity	SA Score	Downes score	N (%)
Mild	<3	<3	48(32)
Moderate	3-7	3-6	92(61.3)
Severe	>7	>6	10 (6.7)

Table 2: Severity of RD based on SA and Downe's scoring

The etiological cause of RD was shown in Table 3. In our study the major cause of RD in neonates is due to TTN in 40% followed by RDS (24%) and neonatal sepsis (13.3%). The meconium aspiration syndrome (MAS) was found in 9.3% of neonates.

Etiological causes	N (%)
TTN	60 (40)
RDS	36 (24)
Neonatal sepsis	20 (13.3)
MAS	14 (9.3)
Birth asphyxia	8 (5.3)
Acyanotic congenital heart disease	4 (2.7)
Congenital diaphragmatic hernia	4 (2.7)
Congenital pneumonia	2 (1.3)
Pneumothorax	2 (1.3)

Table 3: Etiological causes of RD in neonates

Risk factors	N (%)
GDM	50 (33.3)
Preeclampsia	38 (25.3)

PROM	30 (20)
Meconium-stained liquor	16 (10.7)
Antepartum hemorrhage	6 (4)
Maternal pyrexia	6 (4)
Obstructed labor	4 (2.7)

Table 4: Risk factors for neonatal RD in the present study

Treatment modality	N (%)
Oxygen support	88 (58.7)
Mechanical ventilation	44 (29.3)
CPAP	18 (12)

Table 5: Treatment modality among the RD neonates

Etiological causes	N (%)	Discharge N (%)	Mortality N (%)
TTN	60 (40)	60 (40)	--
RDS	36 (24)	34 (22.7)	2 (1.3)
Neonatal sepsis	20 (13.3)	16 (10.7)	4 (2.7)
MAS	14 (9.3)	14 (9.3)	0
Birth asphyxia	8 (5.3)	8 (5.3)	0
Acyanotic congenital heart disease	4 (2.7)	4 (2.7)	0
Congenital diaphragmatic hernia	4 (2.7)	4 (2.7)	0
Congenital pneumonia	2 (1.3)	2 (1.3)	0
Pneumothorax	2 (1.3)	2 (1.3)	0

Table 6: Etiological causes

DISCUSSION

RD in newborn causes increased workload in breathing and it is characterized by tachypnoea, grunting, retractions of chest with decreased air entry and cyanosis. RD is a common event during neonatal period and incidence rate are as follows in term (5%), late preterm (15%) and 30% in neonates born at gestation <34 weeks.⁶

In the present study the incidence of RD was higher in males encompassing 69.3%. A previous cohort study encompassing 500,000 preterm newborn infants showed increased incidence of RD in males as compared to females with an odds ratio of 1.22 to 1.38 and it was significant.¹³ The reason for higher incidence in males is due to the fact, male sex hormone (androgen) regulates the signalling mechanism of epidermal growth factor and transforming growth factor-beta, and thus hampers the fetal lung development and maturation. In addition, it inhibits the release of fibroblast-pneumocyte factor leading to delay in the formation of type II alveolar cells, and thus reduces the formation of pulmonary surfactant. Meanwhile, female hormone estrogen enhance

the secretion of pulmonary surfactants and enhances the population of type II alveolar cells by promoting the lamellar bodies production.⁷

In our study, the incidence of RDS was higher in neonates delivered through caesarean section with rate of 68%. In a study done by Ahmed et al among the RD neonates 87.16% were delivered through caesarean section which was higher when to the current study. Caesarean section is one of the important risk factors for the development of RD, since during vaginal delivery fetus utilizes one-third of the fetal lung fluid. But in the case of caesarean delivery the fetal lung fluid is not properly absorbed leading to RD. Further, during labor period it activates the production of surfactant and in caesarean delivery this process is not achieved.⁸

The onset of RD in the present study is within 24 hours after delivery in most of the cases, 74.7%. Similar to our report, in a study done by Barkiya et al the onset of RD was 24 hours in 80% of the babies.

The severity of RDS was evaluated using the Silverman and Downes rating scores. In the present study based on these scores, majority of the neonates, 61.3% were in the moderate severity. Similarly in Loor et al study Silverman score showed moderate severity in 39.1% of the neonates, whilst Downes score showed mild RD severity in 50% of the neonates.⁹

In the present the major etiological cause of RD is TTN in 40% of the neonates. TTN is the most frequent cause of RD in neonates irrespective of the gestational age and it occurs when there is delay in pulmonary fluid resorption after birth. TTN is also referred as wet syndrome and elective caesarean section is also associated with the increased incidence of TTN. In a study done by Barkiya et al the next major etiology in the present study was RDS in 24% the neonates. Likewise, in Mishra et al study the second most common cause of RD in RDS in 27 % of the neonates.¹⁰

CONCLUSION

Transient tachypnoea of new-born is the most common etiology for RD and neonatal sepsis accounts for mortality in the present study. The neonates well responded to oxygen therapy and early intervention is important to prevent mortality.

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