



CAUSES AND OUTCOMES OF RESPIRATORY DISTRESS IN NEONATES HOSPITALIZED IN THE NEONATAL INTENSIVE CARE UNIT: A CROSS SECTIONAL STUDY

Paediatric Medicine

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ABSTRACT

Background: Respiratory distress in neonates(NRD) is one of the most common problems encountered during the first few day of life. NRD could be due to RDS, TTN, MAS, Perinatal Asphyxia, Congenital pneumonia, CHD and surgical anomalies. Hence, present study was intended to determine the incidence of various causes and outcomes of NRD hospitalised in the NICU of Narayana Medical College and Hospital, Nellore. **Objective:** To determine the incidence of various causes and outcomes of respiratory distress in neonates hospitalized in the NICU. **Materials And Methods:** A Cross-sectional observational study was conducted in the NICU of Narayana Medical College and Hospital, during the period of 1-04-2022 to 30-09-2022(6 months). **Participants :** NRD of various etiology, irrespective of gender, Birth weight were included in the study group after obtaining informed and written consent from parents. **Methods:** The required baseline demographic information were collected from parents and hospitalized data from NICU during admission. **Results:** Among 276 neonates, intercostal retractions(75%), tachypnea(66%) and grunting(61.2%) were the most common symptoms of NRD. RDS(43.1%), MAS(38.8%) and perinatal asphyxia(10.9%) were the most common causes of NRD. There was 100% recovery rate. **Conclusions:** It was found that RDS was the most common cause of respiratory distress in the hospitalised neonates irrespective of gestational age, birth-weight and gender.

KEYWORDS

Respiratory distress syndrome, Meconium aspiration syndrome, Perinatal asphyxia.

INTRODUCTION

The presence of one or more of the signs of tachypnea, intercostal retraction, grunting, nasal flaring and cyanosis indicates the existence of neonatal respiratory distress(NRD), one of the most common problems in the first few days of neonatal life. According to reports, between 5% and 29% of infants in NICUs have NRD (1-3). The following conditions increase the likelihood of developing NRD: prematurity, caesarean delivery, meconium-stained liquor, gestational diabetes, preeclampsia, multiple pregnancies, chorioamnionitis, oligohydramnios and structural lung problems (4, 5). Transient tachypnea of the Newborn(TTN), a benign cause rather than a sign of a major infection like encephalopathy or congenital defects, which may be the cause of neonatal respiratory distress. Numerous conditions can lead to NRD, TTN, RDS, MAS, sepsis, pneumonia, CHD, perinatal asphyxia, pulmonary abnormalities etc (6, 7). Respiratory failure is one of the most significant causes of newborn mortality and accounts for 15% of all infant deaths, it is crucial to diagnose NRD early and treat it promptly (8). Investigating a newborn requires a thorough physical examination, laboratory and radiographic assessment and also understanding of the precise history of NRD-associated events such as a detailed history of pre-term, term and post-term deliveries (9). CXR, ABG, CBC and blood culture are a few useful laboratory tests. The present study intended to determine the frequency of the causes and outcomes of respiratory distress in neonates hospitalised in the NICU of narayana medical college and hospital since having an idea of the common causes of respiratory distress in a particular unit is significant to help better treatment of NRD in future planning.

CASE SERIES

AIMS AND OBJECTIVES

To determine the incidence of various causes and outcomes of respiratory distress in neonates hospitalized in the NICU.

MATERIALS AND METHODS

In this descriptive and cross sectional study, 276 neonates with respiratory distress who were hospitalized in the NICU of Narayana medical college and Hospital in Nellore during April 2022 to September 2022, entered the study.

METHODS

NRD was diagnosed with the presence of one or more symptoms of tachypnea, intercostal retraction, grunting, nasal flaring and cyanosis. The outcomes of NRD led to either hospital discharge with complete improvement of respiratory symptoms or death. Disease history and patient examination carried out to find different causes of respiratory distress.

Measuring Tools

The baseline demographic information like neonatal age upon admission, birth weight, gender, gestational age, birth order, type of delivery, multiple birth, maternal disease was obtained from the parents using a researcher-made questionnaire.

The data regarding causes of respiratory distress, need for surfactant administration and mechanical ventilation, CXR, echocardiography, duration of hospitalisation and outcomes of respiratory distress were collected from NICU during the period of admission.

Inclusion Criteria

All newborn infants with respiratory distress who were hospitalized in NICU with a birth age up to 28 days, of both sexes, with any gestational age and birth weight, were included.

Exclusion Criteria

Neonates with congenital anomalies.

Syndromic infants.

Post-op respiratory distress.

Statistical Analysis

Data was entered into a pre-designed performa spreadsheet, analysed using proper statistical techniques and percentile curves were drawn for the observed values.

RESULTS

Among the neonates delivered during the study period, 300 babies met the eligibility criteria. Of them, 24 babies were excluded. Some were discharged discontinuing the treatment by their parents. Finally 276 neonates were enrolled in the study. A total of 276 infants were studied, 144(52.2%) of whom were female and 132(47.8%) were male. With a minimum birth weight of 860grams and a maximum birth weight of 4.15 kg, the infants in our study had an average birth weight of 2.15 +/-0.45 kg. According to the results, intercostal retractions(75%), tachypnea(66%), grunting(61.2%), nasal flaring(46.2%), cyanosis(35.7%) and apnea(12.3%), were the most common symptoms of NRD. RDS, MAS and Perinatal Asphyxia were the most common causes of NRD.

Table1: Demographic features of infants with respiratory distress

Variables	Frequency	Percentage
Gender	Male	132
	Female	144
Causes of NRD	RDS	119
	TTN	14
	MAS	107
	Pneumonia	4

	CHD	2	0.7
	Asphyxia	30	10.9

Table2: Demographic features of infants with respiratory distress

Variable			Frequency	Percentage
Birth weight	≤2,500 gm	<1000gm	9	3.3
		1001 to 1500gm	31	11.2
		1501 to 2500 gm	83	30.1
	>2,500 gm	2501 to 4000 gm	148	53.6
		≥ 4000 gm	5	1.8
Mean gestational age (weeks)				
Gestational age	Preterm	<28weeks	11	3.9
		28 to 32 weeks	21	7.7
		32 to 34 weeks	36	13
		34 to 37 weeks	71	25.7
	Term	>37 weeks	137	49.7
Surfactant administration	Yes	15	5.4	
	No	261	94.6	

DISCUSSION

According to the current study's analysis of the common causes of respiratory distress, RDS, MAS and perinatal asphyxia were found to be the leading contributors to NRD. According to a research by Adebami et al.,(10) the most frequent causes of NRD include septicaemia, birth asphyxia, RDS and TTN. According to Sauparna et al.(11) the most frequent reasons for NRD hospitalisation were pneumonia, RDS, MAS, TTN, CHD, diaphragmatic hernia and pulmonary haemorrhage. The common causes of NRD were discovered to be TTN, RDS, asphyxia and MAS by Swarnkar et al.(12) and Kommawar et al.(13). RDS, TTN, pneumonia and MAS were regarded as the most frequent reasons for hospitalisation for NRD in Parkash et al(14)'s study. In most centres, RDS, TTN, MAS and pneumonia were determined to be the most frequent reasons of hospitalisation for infants with respiratory distress in the NICU. The current study revealed that 75.3% of infants had intercostal retraction, 67.7% had tachypnea, 61.3% had grunting, 45.2% had cyanosis and 16.1% had nasal flaring as symptoms of respiratory distress. Intercostal retraction, tachypnea, impaired feeding, grunting, cyanosis and nasal flaring were determined to be the most common signs of infant respiratory distress by Swarnkar et al(12).

According to Parkash et al.(14), tachypnea, retraction, and nasal flaring were the most frequent NRD symptoms with 100% frequency, grunting and cyanosis with 60.9% and 40% frequency, respectively. In a research by Barkiya et al.(15), grunting and cyanosis were common in 41% of newborns with respiratory distress, while tachypnea, retraction, and nasal flaring were present in more than 80% of infants. However, Swarnkar et al.(12) shown that among the respiratory symptoms, grunting and nasal flaring had higher specificity for NRD whereas tachypnea, retraction, and feeding dysfunction had higher sensitivity for the diagnosis of NRD.

Infants with NRD died from the condition in 36.6% of cases, according to Adebami et al. (10) According to Tochie et al. (3), who discovered that sepsis and RDS were the most frequent reasons for NRD hospitalisations. Sepsis, preterm and RDS were to blame for 24.5% of newborn deaths from NRD. RDS (61.6% of deaths) was the leading cause of infant mortality, according to Kommawar et al. (12). 22.8% of infants in the study by Swarnkar et al. (12) died of NRD, with RDS accounting for the majority of these deaths (62.5%). In our study outcome was 100% successful without any deaths.

Limitations

Our study has a few drawbacks, a larger sample size study with long-term follow-up is recommended to analyse the morbidity and mortality of babies with respiratory distress because the sample size in our study was limited compared to other studies and long-term outcomes were not evaluated

CONCLUSION

It was found that RDS is the most common cause of respiratory distress in the hospitalised neonates irrespective of gestational age, birth weight, gender. In finale, it was concluded that improving the care of newborns requires mechanical ventilation and prevention of apnea lead to better outcomes and reduced neonatal mortality rate.

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