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Original Research Article

A Clinical Investigation of New-Born Respiratory Distress and Its Results

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Abstract:

Introduction: One of the significant clinical manifestations of a number of respiratory system illnesses as well as non-respiratory problems in neonates is respiratory distress. According to estimates, respiratory distress is the cause of 40–50% of all perinatal deaths. Therefore, it is important to understand the causes and prognosis of infants with respiratory distress. The purpose of this study is to understand the cause, clinical characteristics, treatment, and prognosis of infants with respiratory distress.

Aims and Objectives:

1. To calculate the prevalence of respiratory distress among new-borns.
2. To be aware of the causes of respiratory distress. 3. To research respiratory distress's mortality and morbidity in the NICU.

Materials and Methods: This study was conducted in the department of Respiratory medicine, all new-born infants hospitalised to the Neonatal Intensive Care Unit (NICU) who experienced respiratory distress were examined. These admissions included both new-borns who were delivered at our hospital (in-borns) and new-borns who were referred to our NICU from other hospitals and birthing facilities (outborns).

Results: The clinical spectrum of respiratory distress in new-borns and its outcome were examined in the current study, which is descriptive in character. During the study period, there were 553 neonates admitted to the NICU, and 76 (13.7%) of them experienced respiratory distress. With 6 deaths total, 92.2% of research participants survived. Preterm with RDS caused 4 deaths, BA with RDS and sepsis caused 1 death, and BA with RDS alone caused 1 death. RDS (83% of the deaths) was the primary cause.

Conclusion: Respiratory distress was primarily brought on by transient tachypnea, followed by RDS. The majority of the time, the clinical picture and the X-ray findings were in agreement. ABG was typically found to be normal. The primary reason for ventilation was RDS.

Keywords: NICU, Birth Asphyxia, Respiratory Distress

Introduction

One of the significant clinical manifestations of a number of respiratory system illnesses as well as non-respiratory problems in neonates is respiratory distress. According to estimates, respiratory distress is the cause of 40–50%

of all perinatal deaths. [1, 2, 3] RDS is the primary cause of respiratory distress, followed by pneumonia and major aspiration. A significant improvement in the treatment of respiratory distress has been made by the use of ventilator therapy in a variety of modes, including CPAP, traditional mechanical ventilation, ultra high frequency jet ventilation, liquid ventilation, surfactant replacement therapy, sophisticated monitoring, and extracorporeal membrane oxygenation. [4]There have been very few clinical studies on infant respiratory distress in our nation, despite the recent advances in its diagnosis and management. [5]Therefore, it is important to understand the causes and prognosis of infants with respiratory distress. The purpose of this study is to understand the cause, clinical characteristics, treatment, and prognosis of infants with respiratory distress.

Aims and Objectives:

- To calculate the prevalence of respiratory distress among newborns.
- To be aware of the reasons of respiratory distress.
- To examine respiratory distress's mortality and morbidity in NICU.

Materials and Methods

This study was conducted in the department of Respiratory medicine, all new-born infants hospitalised to the Neonatal Intensive Care Unit (NICU) who experienced respiratory distress were examined. These admissions included both new-borns who were delivered at our hospital (in-borns) and new-borns who were referred to our NICU from other hospitals and birthing facilities (outborns).

Inclusion criteria:

- Both in-born and out-born neonates experiencing respiratory distress were admitted to the NICU.

Exclusion criteria:

- Neonates greater than 28 days.
- Babies weigh under a 1000 gms.
- Babies who are less than 28 weeks.

Under an open care system with servo control, infants were nursed. The presence of at least two of the following clinical signs—RR of 60 or more, subcostal indrawing, xiphoid retraction, suprasternal indrawing, flaring of the alae nasi, expiratory grunt, and cyanosis at room temperature—was used to diagnose the cases. These infants underwent a thorough examination with special attention paid to their gestational age, sex, weight, and cyanosis. They were also evaluated using the Silvermen Anderson scoring system and the Downe's scoring system. The details of the cardiovascular, nervous, and respiratory systems were studied. They received therapy for the specific indication and were kept under close observation until discharge or death. The mother's relevant prenatal history was examined in retrospect.

The meticulous examination of the history, clinical, and radiological data served as the major foundation for diagnosing clinical diseases causing respiratory distress. Using a pulse oxymeter, oxygen saturation was continuously monitored. ABG studies were frequently carried out in unstable newborns and whenever the ventilator's settings were altered. A sepsis workup was carried out when clinically appropriate, and an endotracheal tube and blood culture sensitivity test were ordered if septicaemia or pneumonia were suspected. The dextrostix was used to monitor blood sugar levels on a regular basis.

An oxygen concentrator was used to provide oxygen, which is a useful piece of equipment. Those who needed ventilator support had their ventilators started. The objective of the ventilator settings, taking into account the underlying condition and ABG analysis, was to maintain normal blood gases while using the least amount of fractional inspired oxygen concentrator (FiO2). All infants received chest physical

therapy before and after ventilation, as well as for any issues such air leak, congestive heart failure, infection, PDA, etc. were observably kept. The ventilator was removed from infants when they showed clinical and radiological improvements as well as normal blood gases. Dexamethasone was given 0.2 to 0.4 mg/kg 24 hours before to the predicted estuation. The infant's death from the disease or when the newborn was hemodynamically stable, receiving feeds, and prepared for discharge from the NICU were the study's endpoints.

Results

The clinical spectrum of respiratory distress in newborns and its outcome were examined in the current study, which is descriptive in character. During the study period, 277 new-borns were admitted to the NICU, and 38 (13.74%) of them experienced respiratory distress.

Table 1: Distribution of subjects according to maturity

Maturity	No. of Infants	No. of Respiratory Distress Babies
Term	198 (71.4)	15 (39.4)
Pre-term	79 (28.5)	23 (60.5)
Total	277 (100)	38 (100)

Table 2: Distribution of Etilogy of respiratory distress (n=38)

Cause	No. of Cases (n=38)	Percentage
RDS	12	31.5
TTNB	18	47.3
BA	9	23.6
Pneumonia and sepsis	9	23.6
MAS	3	7.8
Pneumothorax	1	2.6
CHD(PDA)	1	2.6
Laringomalacia	1	2.6

Table 3: Distribution of chest X-ray findings among respiratory distress babies

X-ray Findings	No. of Cases	Percentage
HMD with varying grades	10	26.3
Hyperinflated	11	28.9
Infiltration	7	18.4
Pneumothorax	1	2.6
Normal	9	23.6
Total	38	100

Table 4: Treatment of respiratory distress babies

Treatment Given	No. of Cases (n=38)	Percentage
Oxygen therapy	38	100
Ventilator	8	21
Surfactant	2	5.2

Table 5: Distribution of outcome of respiratory distress babies

Outcome	No. of Babies (n=76)	Percentage
Survived	35	92.1
Deaths	3	7.8
Total	38	100

Discussion

In our study, there were 15 (39.4%) term and 23 (60.5%) preterm births. According to Thomas et.al study's [4], RD was present in 58% of term new-borns and 42% of preterm neonates. Among the 182 infants with RD in the Khatua SP et al. study [5], 133 (73%) were term infants, and 49 (29%) were pre terms. 9 (23.6%) of the 5 PROM cases in our study had sepsis and pneumonia. In the Philip et al. research, [8] 671% of the individuals with a history of PROM experienced sepsis and pneumonia.

In our study, we found that there were 18 (47.3%) babies with TTNB, 12 (31.5%) babies with RDS, 9 (23.6%) babies with BA, 9 (23.6%) babies with pneumonia and sepsis, 3 (7.8%) babies with MAS, 1 (2.6%) babies with pneumothorax, 1 (2.6%) neonates with CHD, and 1 (2.6%) neonates with laryngomalacia as the cause of respiratory distress.

According to Tudehope and Smith [9], anticipatory lung fluid clearance will not have taken place without labour; hence TTNB is the most common cause of RD, accounting for 41% of cases. He also shown that TTNB was more common after caesarean section before labour.

Transient tachypnea of the new-born (TTN) was discovered to be the most frequent (42.7%) cause of RD in the study conducted by Alok kumar and Bhat B V [10], followed by infection (17.0%), meconium aspiration syndrome (10.7%), hyaline membrane disease (9.3%), and birth asphyxia (3.3%). In our study, 2 neonates who received surfactant survived whereas all 8 neonates who were ventilated died. In a research by Kulkarni M. L. et al., [11] 51% of ventilated infants survived.

With 3 deaths, 92.1% of study subjects survived overall. Preterm with RDS caused 2 deaths, preterm with BA with RDS caused 1 death, and preterm with BA with RDS and sepsis caused 1 death. RDS (83% of the deaths) was the primary cause. Malhotra A. K. [12] claimed that 88% of deaths were caused by HMD, all instances of TTNB and MAS were successfully treated, 66% of deaths were attributed to BA, and 50% of deaths were attributed to pneumonia and sepsis. In our analysis, all infants under 2.5 kilogrammes that died. The majority of deaths, according to Malhotra AK [12], were in children under 2.5 kg, and respiratory distress accounted for 13.7% of all NICU admissions.

Males made up the majority of the preterm newborns, which were mostly delivered vaginally. The incidence of RD is increased by antenatal risk factors. Respiratory distress was primarily brought on by transient tachypnea, followed by RDS. The majority of the time, the clinical picture and the x-ray findings were in agreement. ABG was typically found to be normal. The primary reason for ventilation was RDS. The survival percentage for RD cases admitted to the NICU was 92.1%. Preterm and RDS were the most frequent causes of mortality.

Conclusion

Of all NICU admissions, respiratory distress accounted for 13.7%. Males made up the majority of the preterm newborns, which were mostly delivered vaginally. The incidence of RD is increased by antenatal risk factors. Respiratory distress was primarily brought on by transient tachypnea, followed by RDS. The majority of the time, the clinical picture and the x-ray findings were in agreement. ABG was typically found to be normal. The primary reason for ventilation was RDS. The survival percentage for RD cases admitted to the NICU was 92.1%. Preterm and RDS were the most frequent causes of mortality.

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