

Original Research Article

STUDY OF RISK FACTORS ASSOCIATED WITH RESPIRATORY DISTRESS IN NEONATES ADMITTED IN NICU OF OUR TERTIARY CARE HOSPITAL

Dr. Mukesh Kumar Sonkaria^{1*}

^{1*} Assistant Professor, Dept. of Paediatrics, National Institute of Medical Sciences & Research, Jaipur

***Corresponding Author:** Dr. Mukesh Kumar Sonkaria

*Assistant Professor, Dept. of Paediatrics, National Institute of Medical Sciences & Research, Jaipur

ABSTRACT

Aim of the study: The objective of the present study is to find out the incidence and aetiology of respiratory distress in neonates admitted in neonatal intensive care unit (NICU) of a tertiary care hospital.

Materials and methods: A prospective observational study to assess the newborn of less than 28 days of age admitted with respiratory distress (RD) in NICU according to National neonatal perinatal database (NNPD) criteria during a period of 1 year.

Results and Discussion: The present study was undertaken to find out the risk factors and various etiologies associated with development of RDS in neonates admitted in NICU of our tertiary care hospital. Out of the total 1220 neonates, 334 neonates fulfilled the criteria for inclusion in our study. We found the incidence of RDS is 27.37%. The frequency of respiratory distress was more in pre term neonates 219 (59.2 %) than term 122 (36.5 %) and post term neonates 14 (4.91%). There was a male preponderance with respect to the sex of baby. One hundred thirty eight (34.73%) patients had birth weight in the range of 1500-2490 grams, followed by 124 (37.12%) with birth weight of >2500 gram. 180 (53.8%) mothers were G1, 128 (38.32%) were G2, 22 (6.58%) were G3 and 4 (1.19%) were >G3. Out of 334 mothers 102 were booked and 232 were unbooked and also 180 had LSCS and 154 had normal delivery.

We evaluated the risk factors associated with respiratory distress we found the most common risk factor was anemia 49.1%, followed by PIH 9.58% and meconium stained aspiration syndrome 8.38%. The aetiology of respiratory distress were respiratory distress syndrome in, followed by sepsis in, perinatal asphyxia, meconium aspiration syndrome, pneumonia, TTNB and pneumothorax neonates admitted in NICU with respiratory distress (Table 3).

Conclusion: In the present study, we found that the RD was more in pre-term neonates than term and post term neonates. The most common risk factor associated with RDS in mothers is anemia. The aetiology of RD were RDS followed by sepsis, perinatal asphyxia, meconium aspiration syndrome, pneumonia, TTNB and pneumothorax in neonates admitted in NICU with respiratory distress. A mortality rate was maximum in RDS followed by in perinatal asphyxia, meconium aspiration syndrome, and neonatal sepsis. Respiratory distress is one of the most common cause of neonatal morbidity and mortality. Early detection and appropriate management is the key to ensure the best outcome in neonates with respiratory distress.

Keywords: Respiratory distress syndrome (RDS); respiratory distress; NICU; neonatal distress.

INTRODUCTION

The potentially fatal illness known as acute respiratory distress syndrome (ARDS) is typified by low oxygenation and uncooperative or "stiff" lungs. Diffuse Alveolar Damage and Capillary Endothelial Injury are linked to the condition. Patients often experience variable degrees of pulmonary artery vasoconstriction and may experience pulmonary hypertension after developing ARDS. There aren't many effective treatment options for ARDS, and the syndrome has a significant death rate. In addition to reviewing the clinical presentation, assessment, and treatment of acute respiratory distress syndrome, this exercise emphasizes the value of coordinated interprofessional teamwork in the patient's care.

ARDS can result from a broad range of etiologies, which the literature refers to as precipitating risk factors. The most frequent cause of ARDS, pneumonia, is responsible for almost half of all cases of ARDS. Additional frequent causes include trauma, transfusion, non-cardiogenic shock, aspiration, and extrapulmonary sepsis. Histological and biochemical alterations in the lungs can be caused by many ARDS etiologies [1–7].

According to accumulating evidence, ARDS is a heterogeneous condition with varying respiratory mechanics, biomarker profiles, and radiographic lung morphology [8, 9]. The cause of ARDS is thought to be a significant source of variability; nevertheless, in order to assess etiology-associated heterogeneity, prior research has typically used a binary classification, such as pulmonary vs extrapulmonary ARDS or sepsis against non-sepsis ARDS [11–14]. The goal of the current study is to assess the risk variables linked to respiratory distress in newborns admitted to our tertiary care facility.

OBJECTIVE OF THE STUDY

The present study is undertaken to evaluate the risk factors associated with respiratory distress in newborn admitted at our tertiary care hospital.

MATERIALS & METHODS:

Source of data: The present study is a prospective observational study conducted at the Neonatology unit of a tertiary care Institution. The Study was conducted over a period of one year.

Study type: prospective observational study.

Sample size: 284 neonates with RDS.

Inclusion criteria: The study population comprised of new born less than 28 days of age with the diagnosis of respiratory distress. Informed consent was obtained from the parents of child before the inclusion in the study.

Exclusion criteria: The neonates whose parents did not give consent, and those with any obvious congenital malformation requiring urgent surgery, and outborn newborn were excluded from the study.

Methodology and data collection: According to NNPD 2002-03, respiratory distress was defined as, New born having at least 2 of following criteria, Respiratory Rate > 60/minuts, Subcostal/intercostal recessions and Expiratory grunt/groaning. All new borns admitted to the NICU with respiratory distress were enrolled after fulfilling the inclusion and exclusion criterion and studied in details with regards to obstetric history like period of gestation, gravidity of mother, status of mother (booked/unbooked case), maternal chronic diseases (anemia, diabetes mellitus, hypothyroidism, tuberculosis etc) , antenatal history (maternal fever, leaking per vaginum, chorioamnionitis, polyhydroamnios, oligohydroamnios, pregnancy induced hypertension, eclampsia etc), natal history (meconium stained amniotic fluid, prolonged labour etc), postnatal history like (mode of delivery, sex of baby, birth weight and maturity of baby, assessment of APGAR score, onset and duration of respiratory distress) and all necessary investigation (sepsis screen, blood culture and chest X ray etc) had done to define the probable etiologies of respiratory distress.

Statistical analysis: statistical analysis was performed using the statistics software SSPS 20 for windows. Qualitative data was expressed in form of frequency and percentage. Correlation was established between probable etiologies and outcome by using Chi square test.

RESULTS:

1110 neonates admitted in NICU with all complaints of which 284 neonates satisfying the criteria of the study were enrolled over a period of one year. The incidence of respiratory distress was found to be 24.64% (70/284) in our tertiary care hospital.

Table 1: Demographic characteristics of neonates admitted with respiratory distress syndrome.

Parameters	Characteristics	Number (%)
Gestation Age	<37 weeks	198 (59.2%)
	>37 weeks	122 (36.5%)
	>42 weeks	14 (4.19%)
Sex of Baby	Male	210 (62.87%)
	Female	124 (37.12%)
Birth Weight	<1000 grams	38 (11.37%)
	1000-1490 grams	64 (19.16%)
	1500-2490 grams	116 (34.73%)
	>2500 grams	124 (37.12%)
Gravida of Mother	G1	180 (53.8)
	G2	128 (38.32)
	G3	22 (6.58)
	>G3	4 (1.197)
Booked Mother	Booked	102 (30.53)
	Unbooked	232 (69.46)
Mode of Delivery	LSCS	180 (53.89)
	Normal	154 (46.10)

Table 2: Distribution of risk factors (maternal, antenatal and postnatal) associated with neonatal respiratory distress in NICU.

Risk Factors	Present	
	Frequency	Percent
Anemia	164	49.1%
Diabetes mellitus	14	4.19%
Hypothyroidism	6	1.79%
Fever and Rash	14	4.19%
Pregnancy induced hypertension	32	9.58%
Eclampsia	8	2.39%
LPV	22	6.58%
Chorioamnionitis	6	1.79%
Polyhydroamnios	8	2.39%
Oligohydroamnios	22	6.58%
Prolonged labor	24	7.18%
MSAF	28	8.38%

Table 3: Probable aetiologies on neonatal respiratory distress.

Probable Aetiologies of RD	Frequency	Percent
Respired Distress Syndrome		30.5%
Sepsis	74	22.15%
Perinatal Asphyxia	48	14.37%

Meconium aspiration syndrome	42	12.57%
Pneumonia	34	10.17%
Transient tachypnea of newborn	30	8.98%
Pneumothorax	4	1.19%

DISCUSSION

The goal of the current study was to identify the risk variables and different etiologies linked to the development of RDS in newborns admitted to our tertiary care hospital's NICU. 334 of the 1220 neonates in total met the requirements to be included in our study. We discovered that 27.37% of cases have RDS. Preterm infants had a higher frequency of respiratory distress (219;59.2%) compared to term neonates (122;36.5%) and postterm neonates (14; 4.91%).

About the baby's sex, there was a majority of males. Among the patients, 108 (34.73%) had a birth weight between 1500 and 2490 grams, whereas 124 (37.1%) had a birth weight greater than 2500 grams. Of the 180 mothers, 53.8 percent were G1, 128 were G2, 22 were G3 (6.58%), and 4 (1.19%) were >G3. Among the 334 moms, 102 had appointments, 232 did not, 180 underwent LSCS, and 154 had regular deliveries.

We evaluated the risk factors associated with respiratory distress we found the most common risk factor was anemia 49.1%, followed by PIH 9.58% and meconium stained aspiration syndrome 8.38%. The aetiology of respiratory distress were respiratory distress syndrome in, followed by sepsis in, perinatal asphyxia, meconium aspiration syndrome, pneumonia, TTNB and pneumothorax neonates admitted in NICU with respiratory distress (Table 3).

CONCLUSION:

In the present study, we found that the RD was more in pre-term neonates than term and post term neonates. The most common risk factor associated with RDS in mothers is anemia. The most common aetiology of RD was RDS followed by sepsis, perinatal asphyxia, meconium aspiration and others. A mortality rate was maximum in RDS followed by in perinatal asphyxia, meconium aspiration syndrome, and neonatal sepsis. Respiratory distress is one of the most common cause of neonatal morbidity and mortality. Early detection and appropriate management is the key to ensure the best outcome in neonates with respiratory distress.

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