Original Article

Study On Evaluation Of Risk Factors Associated With Respiratory Distress In Neonates Admitted In Nicu Of Our Teritiary Care Hospital

Dr. Sandeep Rama Thute[1*]

[1*]Assistant Professor, Dept. of Pediatrics, Saraswathi Institute of Medical Sciences, Hapur

***Corresponding Author:** Dr. Sandeep Rama Thute

*Assistant Professor, Dept. of Pediatrics, Saraswathi Institute of Medical Sciences, Hapur

Abstract

Aim of the study: 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. The incidence was calculated as the number of newborn with respiratory distress per population at risk. The various parameters like obstetric history and clinical profile of newborn were studied.

Results and Discussion: The present study intended 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 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.

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

INTRODUCTION

Acute respiratory distress syndrome (ARDS) is a life-threatening condition characterized by poor oxygenation and non-compliant or "stiff" lungs. The disorder is associated with capillary endothelial injury and diffuse alveolar damage. Once ARDS develops, patients usually have varying degrees of pulmonary artery vasoconstriction and may develop pulmonary hypertension. ARDS carries a high mortality, and few effective therapeutic modalities exist to ameliorate this deadly condition. This activity reviews the clinical presentation, evaluation, and management of acute respiratory distress syndrome and highlights the importance of coordinated inter professional teamwork in caring for patients with this condition.

A wide variety of etiologies, referred to as precipitating risk factors in the literature, can lead to ARDS. Pneumonia is the most common etiology of ARDS and accounts for roughly half of all ARDS cases. Other common etiologies include extra pulmonary sepsis, aspiration, non-cardiogenic shock, transfusion and trauma. Different etiologies of ARDS can result in different histological and biological changes in the lungs [1-7].

Cumulative data have suggested that ARDS is a heterogeneous syndrome with diverse radiographic lung morphology, respiratory mechanics and biomarker profiles [8, 9]. The etiology of ARDS is considered an important source of heterogeneity however, previous studies have usually adopted a dichotomous classification to evaluate etiology-associated heterogeneity, such as pulmonary versus extra pulmonary ARDS or sepsis versus non-sepsis ARDS [11-14]. The present study is undertaken to evaluate the risk factors associated with respiratory distress in newborn admitted at our tertiary care hospital.

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 12 months of the period starting from January 2016 to December 2017.

Study type: prospective observational study.

Sample size: 334 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:

1220 neonates admitted in NICU with all complaints of which 334 neonates satisfying the criteria of the study were enrolled over a period of one year. 27.37% neonates developed respiratory distress in our NICU.

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%
Oligohydroaminos	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	102	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 present study intended to find out the risk factors and various etilogies 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 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.

REFERRENCES

1. Edwards MO, Kotecha SJ, Kotecha S. Respiratory distress of the term newborn infant. Paediatric respiratory reviews. 2013 Mar 1;14(1):29-37.

2. NNPD report on intramural live births. NNPD report 2002-03. NNPD network, ICMR; P30.

3. Mathai SS, Raju U, Kanitkar M. Management of respiratory distress in the newborn. Medical journal Armed Forces India. 2007 Jul;63(3):269.

4. Govt of India (2015), *SRS report 2015, Estimates Of Mortality Indicators*, Office of the Registrar General and Census Commissioner India, Ministry Of Home Affairs, New Delhi.

http://www.censusindia.gov.in/vital_statistics/SRS_Report_2015/8.Chap%204Mortality%20 Indicators- 2015

5. Govt of India (2013), Causes for Maternal and Child deaths in India. *A Strategic Approach to reproductive, Maternal, Newborn, Child and Adolescents Health* (RMNCH+A), January 2013, Ministry Of Health and Family welfare, New Delhi. http://www.cghealth.nic.in/nhmcg/Informations/RMNCH/1_RMNCHA_Strategy.
6. Agrawal R, Deorari A, Paul K V, *Aiims Protocol in Neonatology* First edition, New Delhi: CBS publishers; 2015, P-80.

7. Barkiya SM, Venugopal N, Kumari V. Clinico-Etiological Profile and Outcome of Neonatal Respiratory Distress. Int J Sci Stud 2016;3 (11): 189-192.

8. Kumar A, Bhat BV. Epidemiology of respiratory distress of newborns. Indian J Pediatr. 1996 Feb; 63 (1): 93–8.

9. Santosh S, Kumar K, Adarsha E. A clinical study of respiratory distress in newborn and its outcome. *Indian J Neonatal Med Res*. 2013;1(1):2-4.

10. Parkash A, Haider N, Khoso ZA, Shaikh AS. Frequency, causes and outcome of neonates with respiratory distress admitted to Neonatal Intensive Care Unit, National Institute of Child Health, Karachi. J Pak Med Assoc. 2015 Jul 1;65(7):771-5.

11. Dani C, Reali MF, Bertini G, Wiechmann L, Spagnolo A, Tangucci M, Rubaltelli FF. Risk factors for the development of respiratory distress syndrome and transient tachypnoea in newborn infants. European Respiratory Journal. 1999 Jul 1;14(1):155-9.

12. Hameed NN, Al-Janabi MK, Al-Reda YI. Respiratory distress in full term newborns. The Iraqi Postgraduate Medical Journal. 2007;6(3):233-9.

13. Holikar SS, Meshram RJ. Study of maternal attributes of neonatal respiratory distress in NICU.

14. Ravindra P, Raghavendraswamy K, Shreeshail DB. Clinical Profile and Outcome of Babies Admitted to Neonatal Intensive Care Unit (NICU), Mc Gann Teaching Hospital Shivamogga, Karnataka: A Longitudinal Study, Sch. J. App. Med. Sci. 2014;2(6G):3357-60.