



## STUDY OF CLINICO- ETIOLOGICAL PROFILE OF RESPIRATORY DISTRESS IN NEONATE: A TERTIARY CARE HOSPITAL EXPERIENCE.

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### ABSTRACT

**Introduction:** Respiratory distress (RD) is a common problem in neonatal period. It is an important cause of neonatal mortality. The etiology of RD in newborn is large, include transient tachypnea of newborn (TTN), respiratory distress syndrome (RDS), meconium aspiration syndrome (MAS), and other miscellaneous causes. The present study was conducted with objectives to find out the incidence and etiology of respiratory distress among admitted inborn newborns.

**Materials and Methods:** In this prospective study, 1533 inborn newborns admitted in neonatal care unit of *Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi*, between January 2018 to December 2019 were analysed for incidence and etiology of respiratory distress. The diagnosis of respiratory problem was diagnosed as per guideline recommended by NNF. Besides antenatal and birth history, clinical course was noted and relevant investigations were done.

**Results:** In the study population, respiratory distress was detected in 152 newborns, comprising 6.4% of all inborn admission and 14.15% of sick newborns. Transient tachypnea of the newborn (TTNB) was the commonest (32.23%) cause of respiratory distress followed by pneumonia (24.35%), MAS (13.15%), birth asphyxia (12.5%), RDS (7.9%), cardiovascular (3.3%) and surgical causes (2.63%).

**Discussion:** The incidence and etiology of respiratory distress is comparable to other studies except, relative high incidence of MAS and birth asphyxia. The incidence of RDS among ELBW was quite high (41.6%). The etiological organisms of neonatal pneumonia are consistent with other studies of this country.

### KEYWORDS : Respiratory distress, newborn

#### INTRODUCTION

Respiratory distress (RD) is a common problem in neonatal period. It is an important cause of neonatal mortality 1,2,3 and it has been found that, respiratory pathology is the commonest autopsy finding among early neonatal death.4,5 The etiology of RD in newborn is large, include transient tachypnea of newborn (TTN), respiratory distress syndrome (RDS), meconium aspiration syndrome (MAS), and other miscellaneous causes. There is paucity of studies regarding the cause of respiratory distress from Eastern India. The present study was conducted with objectives to find out the incidence and etiology of respiratory distress among admitted inborn newborns.

#### MATERIALS AND METHODS

In this prospective study, 1533 inborn new-borns admitted (both sick new-borns and new-borns kept in observational care) in neonatal care unit of *Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi*, between January 2018 to December 2019 were analysed for respiratory distress. Babies with multiple congenital malformations were excluded from the study. Proper consent from parents and permission of ethical committee was taken. Birth weight was taken and maturity was determined by modified Ballard score. Babies were evaluated in quiet state and respiratory rate was counted for 1 minute. Respiratory distress was defined as the presence of 2 or more of the following criteria, namely tachypnea (rate 60/ min), retraction and grunting ; the etiological diagnosis of different types of respiratory disorders were established as per current NNF guidelines. Etiological workup includes, detailed antenatal and birth history, clinical course and related investigations, as and when indicated, e.g. shake test, chest X- ray, sepsis screen, blood cultures, capillary oxygen saturation and respiratory and heart rate monitoring, blood biochemical tests (sugar, Na, K, Ca, urea, creatinine), arterial blood gases (ABG), ECG, echocardiography, barium meal etc.

#### RESULTS

Out of 1533 new-borns screened 150 new-borns (9.7%) developed features of respiratory distress. The incidence of respiratory distress in sick babies was 17.9% (95/530) and in babies for observational care was 5.4% (55/1003). Among 150 new-borns enrolled in the study, 86 were male and 64 female. There were 74 low birth weight babies; among them, VLBW and ELBW babies were 24 and 12 in number. 88 babies were term, 8 babies post term and 56 babies were preterm. Mean birth weight was 1938 gms (range 810 to 4200 gms.) Transient tachypnea of the newborn was the most common cause (32%) of respiratory distress. (Table I) Most babies responded well with oxygen and improved within one day; but 5 babies required 3 days before normalization of respiration rate. Pneumonia was detected among 40 babies. In 8 cases there were history of PROM and 2 mothers had features of chorioamnionitis. Blood culture was positive in 14 babies

(37.8%). Of the 40 babies with pneumonia, 12 cases presented with features of primary pneumonia. In the remaining 25 cases, respiratory distress was associated with septicemia as evident from clinical features, supported by sepsis screen and/or blood culture. Birth asphyxia and meconium aspiration syndrome was seen in 17% and 18% cases respectively. RDS was detected among 12 new-borns (8%) with respiratory distress. Its incidence among VLBW (n=24) and ELBW (n=12) was 30.8% (7/24) and 41.6% (5/12) respectively. All babies were below 34 weeks of gestation. Among cardiovascular causes of respiratory distress (n=5), 3 babies presented with features of heart failure and cyanosis. One had TGA with VSD and other 2 had complex congenital cyanotic heart disease. 2 preterm babies with respiratory distress had PDA complicated with heart failure. Regarding surgical causes (n=4), 2 babies (50%) had oesophageal atresia with tracheoesophageal fistula (type C variety) and 2 babies (50%) had diaphragmatic hernia, suspected clinically and confirmed by radio imaging. All of them were transferred to surgical unit and operated.

**Table I. Etiology and incidence of respiratory distress**

Etiology	Number	Incidence (%)
Transient tachypnea of newborn	48	32.0
Pneumonia	40	26.6
Meconium aspiration syndrome	18	12
Birth asphyxia	17	11.3
Respiratory distress syndrome	12	8.0
Congenital heart disease	5	3.3
Surgical cause	4	2.66
Misc. causes	6	4.0
Total	150	100%

#### DISCUSSION

Present study shows the overall incidence of respiratory distress among inborn babies admitted in neonatal unit is 9.7%. Its incidence among sick babies was 17.9% and among babies admitted in observational care was 5.4%. A study by Kumar A et al.[3] showed the incidence of respiratory distress was 6.7% among all hospital delivery. Another study from a Delhi based referral hospital showed the incidence of respiratory distress 29.28% among all newborn admission, but the study population was mainly consisted of outborn babies.[7] Transient tachypnea of the newborn (TTNB) was the commonest (32%) cause of respiratory distress in newborn which is comparable to some study. 3 Where as hyaline membrane disease (18%) was the commonest cause of respiratory distress in one study 8 and pneumonia (68.7% ) was the commonest cause of respiratory distress in another study.[ 7] Pneumonia was the 2nd common cause of respiratory distress in our study and in most cases it was a part of

septicemia and in 34.28 % cases it was primary pneumonia with positive risk factors. The bacterial isolates (*Klebsiella*, *staphylococci aureus*, *CONS*) are consistent with the earlier studies. [7,9,10] Meconium aspiration syndrome and birth asphyxia was responsible in 13.15% and 12.5% cases respectively causing respiratory distress in our case. Contrary to previous belief, respiratory distress syndrome (RDS) is an important cause of respiratory distress in our set up. In our study 7.8 % of new-born had RDS. Its incidence among VLBW and ELBW was 30.8% and 41.6% respectively. The incidence of RDS is comparable with other studies.[5,7,11] Besides early onset respiratory distress with grunting and subcostal suction, frothing from mouth was an important observation of these babies. Diaphragmatic hernia and oesophageal atresia with tracheo-oesophageal fistula are two surgical conditions leading to respiratory distress in our study. Oesophageal atresia with or without tracheoesophageal fistula have been observed in one study as the commonest paediatric surgical condition leading to neonatal respiratory distress.[12]

## CONCLUSION

- Respiratory distress is an important cause of neonatal morbidity. 6.4% of all inborn admission and 14.15% of sick newborns developed respiratory distress.
- Transient tachypnea of the newborn (TTNB) was the commonest (32.23%) cause of respiratory distress followed by pneumonia (24.355), MAS (13.15%), birth asphyxia (12.5%) and RDS (7.9%).
- *Klebsiella* was the predominant organism causing pneumonia.
- The incidence of RDS among ELBW was quite high (41.6%). Besides early onset tachypnea with grunting and subcostal suction along with increasing oxygen demand, frothing from mouth was an important early finding of RDS.

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