

**A PROSPECTIVE STUDY OF AETIOLOGY AND PREVALENCE OF
RESPIRATORY DISTRESS IN NEWBORNS DELIVERED AT TERTIARY CARE
HOSPITAL**

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Abstract

Introduction: Respiratory distress is among the most important reasons for admission to a neonatal intensive care unit. 15% of term infants and 29% of late preterm infants admitted to the neonatal intensive care unit experience significant respiratory morbidity. Premature neonates are also more likely to be admitted, i.e. neonates born before 34 weeks of gestation.

Materials and Methods: In this descriptive study, total 3110 live new-born were selected by purposive sampling technique. Selection within the strata is done for convenience. All these live new-born babies delivered at Maharshi Devraha Baba Autonomous State Medical College, Deoria during the study period from February 2021 to January 2022 were observed for respiratory distress and the objective was to establish or determine the prevalence and aetiology of respiratory distress in inborn new-born babies. For this study informed consent from parents / guardian were taken.

Results: Respiratory distress was observed in 3110 new-borns (n = 3110) delivered over the study duration of 12 months at this hospital. 19.2 % in preterm, 7 % in post-term and 2.2 % in full term. On the whole common cause of respiratory distress was transient tachypnoea of new-born (TTN) which was 35.3 % while hyaline membrane disease (HMD) was 27 % followed by meconium aspiration syndrome (MAS) 18.4 %, pneumonia 3.3 %, pneumothorax 1.8 % and other congenital anomalies were 14.2 %. In both term and late preterm new-borns, TTN was found to be common, while meconium aspiration syndrome was common among term and post term babies.

Conclusion: Among the neonatal problems with significant mortality and morbidity, respiratory distress is one of the commonest causes, while TTN was the commonest aetiology. Others are hyaline membrane disease and meconium aspiration syndrome.

Key Words: Respiratory distress, morbidity, pneumonia, hyaline membrane disease.

INTRODUCTION

Respiratory distress is among the most important reasons for admission to a neonatal intensive care unit. 15% of term infants and 29% of late preterm infants admitted to the neonatal intensive care unit experience significant respiratory morbidity. Premature neonates are also more likely to be admitted, i.e. neonates born before 34 weeks of gestation.¹

According to research conducted in JIPMER, Pondicherry, Preterm infants had the highest incidence (30%) followed by post-term infants (20.9%) and term babies 4.2%.² Respiratory distress in a new-born is recognized as one or more signs of the increased breathing activity, such as tachypnea, nasal flaring, chest retraction, or grunting. Normally, the respiratory rate of new-born respiration is between 40 and 60 breaths per minute.³ Tachypnea is characterized as a respiratory rate of more than 60 breaths per minute. Tachypnea is a mechanism of

compensation for hypercarbia, hypoxemia, or acidosis (both metabolic and respiratory, making it a normal, but nonspecific, finding in large in a large variety of cardiovascular, metabolic, or systemic diseases.⁴

Respiratory distress is among the most important reasons for admission to a neonatal intensive care unit. 15% of term infants and 29% of late preterm infants admitted to the neonatal intensive care unit experience significant respiratory morbidity. Premature neonates are also more likely to be admitted, i.e. neonates born before 34 weeks of gestation.

Persistent pulmonary hypertension is the complication severe meconium aspiration. HFV or ECMO may be beneficiary to patients with MAS which are refractory to conventional mechanical ventilation. The mortality rate is higher in meconium stained infants in comparison to unstained infants. With the advancement in obstetric and neonatal care, there is decrease in neonatal deaths related to MAS in recent decades.⁶

MATERIALS AND METHODS

In this descriptive study, total 3110 live new-born were selected by purposive sampling technique. Selection within the strata is done for convenience. All these live new-born babies delivered at Maharshi Devraha Baba Autonomous State Medical College, Deoria during the study period from February 2021 to January 2022 were observed for respiratory distress and the objective was to establish or determine the prevalence and aetiology of respiratory distress in inborn new-born babies. For this study informed consent from parents / guardian were taken.

Inclusion criteria:

- All inborn new-born babies admitted in NICU include term, preterm, post term up to 28 days.
- Babies delivered by Caesarean section or vaginal deliveries.

Exclusion criteria:

- Babies more than 28 days
- Out born babies
- Babies with congenital malformations like meningocele, meningomyelocele, encephalocele and anencephaly.

Investigations:

CBC, CRP, blood glucose, blood culture, electrolytes, cranial ultrasound, chest x-rays, pulse oximetry, 2D-Echocardiography.

Any new-born babies showing any two or more clinical signs was suspected to have respiratory distress having respiratory rate of ≥ 60 / minute, subcostal / intercostals recessions and expiratory grunt / groaning in addition to these features that is presence of nasal flaring, suprasternal retractions, decrease air entry on auscultation of the chest.

Data was collected for all newborn babies after the initial evaluation and cardio pulmonary management, a detailed history was collected. General information, socioeconomic status, history of mother and her current and previous ante-natal histories were taken which provided indispensable statistics. Intra-partum particulars with peculiar reference to the fetal well-being, quantity and quality of liquor, duration of the rupture of membrane, drugs given to the mother were recorded. Sex, birth weight, Apgar score, resuscitation particulars, and on the

basis of last date of menstrual period gestational age was calculated and clinical examination findings expressive of respiratory difficulties were also recorded. Time of onset and the severity of the respiratory distress was documented and the severity was assessed by using Downe's score and Silverman Anderson score. All these data was collected for all new-born include in study with respiratory distress. All new-borns with respiratory distress were managed in NICU.

Investigations related to clinical conditions were obtained in all cases. Sepsis screen and bloodculture were indicated when infection was suspected, and echocardiography were done whenever indicated (to ruled out congenital heart disease and to evaluate Persistent pulmonary hypertension). All new-born babies with respiratory distress received supportive and standard care with recording of vital signs and oxygenation saturation, respiratory support insevere condition as respiratory failure.

Statistical Analysis: Data was collected for all new born include in our study. Descriptive statistics were used for analysis of results.

RESULTS

The overall number of live inborn births was 3110 through 1 year of study period. Out of which 2142 were spontaneous vaginal deliveries (SVD) while 918 were delivered by caesarean section. Out of these newborns 134 had evolved respiratory distress. The sex ratio between male and female newborn babies was 1:1. 72 newborns were premature, 57 newborns were full term and 5 newborns were post term. The mean age of newly born babies were 210 minutes. In my present study overall respiratory distress prevalence was 4.4 %. Out of which prevalence of respiratory distress were 19.2 %, 2.2 % and 7 % among preterm, term and post-term respectively. The most important etiology of RD are shown in (Table 1). In this study the commonest cause of respiratory distress was found to be transient tachypnea of newborn (TTN) 35.3 % which was followed by hyaline membrane disease (HMD) 27 %, and 18.4 % have meconium aspiration syndrome (MAS), 3.3 % and 1.8 % have pneumonia and pneumothorax respectively and 14.2 % have other congenital anomalies including CHD (Congenital Heart Disease), CDH (Congenital Diaphragmatic Hernia), choanal atresia, TEF (Tracheo-Esophageal Fistula) & pierre robin syndrome.

| S.No | Primary diagnosis | Frequency | Percentage |
|------|---|-----------|------------|
| 1 | Transient Tachypnoea of Newborn | 47 | 35.3% |
| 2 | Respiratory Distress Syndrome | 36 | 27% |
| 3 | Meconium Aspiration Syndrome | 25 | 18.4% |
| 4 | Others (Congenital Heart Disease / Choanal Atresia / Tracheo-Oesophageal Fistula / Congenital Diaphragmatic Hernia / Pierre Robin Syndrome) | 19 | 14.2% |
| 5 | Pneumonia | 5 | 3.3% |
| 6 | Pneumothorax | 3 | 1.8% |

Table 1: Causes of Respiratory Distress in New-Born (n=134)

DISCUSSION

In this present study overall respiratory distress prevalence was 4.4 %. While other previous studies done in developed countries have prevalence ranging from 3 % to 7 %. These results from our study were equivalent with other results from different studies done in developed countries of world (Alok Kumar et al Malhotra et al).⁷

The factors which influenced the overall distribution of respiratory distress in new-born are geographic distribution, ethnic factors and standard protocol of care in NICU availability. These results from our study were equivalent with other results from different studies done in developed countries of world. In this study the commonest cause of respiratory distress was found to be transient tachypnoea of newborn (TTN) 35.3 % which was followed by hyaline membrane disease (HMD) 27 %, and 18.4 % have meconium aspiration syndrome (MAS), 3.3 % and 1.8 % have pneumonia and pneumothorax respectively and 14.2 % have other congenital anomalies including CHD (Congenital Heart Disease), CDH (Congenital Diaphragmatic Hernia), choanal atresia, TEF (Tracheo-Oesophageal Fistula) & Pierre Robin syndrome.⁸

There is similarities in the pattern of respiratory distress between our studies and the studies done from different developed countries. In preterm infants the most common cause of Respiratory distress syndrome is Hyaline Membrane Disease (HMD), now known as Respiratory distress syndrome of newborn, which is caused by insufficient pulmonary surfactant in the alveoli. In this study among pre-term newborns the prevalence of respiratory distress was 19.2 % that was comparable to different studies done in other developed countries which range from 28 % to 53%.⁹ In another studies whose result was quite comparable to our study, done in Aga Khan university Hospital Karachi Pakistan, result ranges from 12.8 % to 45 %.¹⁷ In another study whose result ranges from 10 % to 16 % closely correlates with our studies in term and post-term newborns, the prevalence of Meconium aspiration syndrome was found in 18.4 % cases.¹⁰

CONCLUSION

Respiratory distress in newborn is one of the commonest causes of admission in NICU, with significant morbidity and mortality. TTN is found in the majority of the cases in term babies whereas hyaline membrane disease is common in preterm babies. TTN is a self-limiting condition which needs only supportive treatment and generally resolves after minimal therapeutic intervention. Giving antenatal corticosteroids to the mother before 37 weeks of gestation can significantly reduce prevalence of HMD. With improvement in obstetrical care, neonatal management, symptomatic care and standard treatment of respiratory distress reduces the cases because of MAS. Pneumonia, pneumo-thorax, septicemia, CNS causes, congenital heart disease and other congenital malformations are the less common causes of respiratory distress, which are managed by disease-oriented treatment. Hence, to reduce morbidity and mortality due to respiratory distress, early diagnosis and prompt treatment are necessary.

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