



## INCIDENCE AND ETIOLOGY OF RESPRATORY DISTRESS IN LOW BIRTH WEIGHT NEONATES BORN IN RURAL TERTIARY CARE CENTRE.

### Paediatric Medicine

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### ABSTRACT

**Background :** To Study The Incidence And Etiology Of Respiratory Distress In Low Birth Weight Neonates Born In Rural Tertiary Care Centre.

**Methods:** This is a prospective observational study. It was carried out in neonatal division of department Of pediatrics MMIMSR, Mullana. The study included 200 low birth weight neonates born during the study period.

**Results:** Out of 200 neonates 63 had respiratory distress. The incidence of respiratory distress in index study was 31.5%. According to weight distribution the incidence of respiratory distress among neonates with 1.5kg to 2.499kg was 27.6%, 1kg to <1.5kg was 57.1% and <1kg was 100%. According to gestation the incidence of respiratory distress among term was 29.8% and preterm was 33.6%. The most common cause of respiratory distress was transient tachypnea of newborn(33.8%) followed by hyaline membrane disease(24.1%), sepsis(17.7%), apnea(9.6%), CVS disorder(6.4%).

**Conclusion:** Low birth weight and preterm deliveries are at higher risk for morbidity during and after the birth. Early antenatal care will greatly reduce the incidence of respiratory distress syndrome in neonates. The incidence increases as birth weight and gestation decreases in neonates Due to recent medical advances and skilled clinical practice the incidence of RDS has decreased. Transient tachypnea of newborn remains the main etiology of respiratory distress in neonates.

### KEYWORDS

Respiratory Distress, Low Birth Weight, Transient Tachypnea Of Newborn And Respiratory Distress Syndrome.

#### INTRODUCTION:

World health organization (WHO) has defined low birth weight as any infant born with a birth weight of less than 2500gm (up to and including 2499gm) which further is categorized into very low birth weight (VLBW) which is between 1000 to 1499gm and extremely low birth weight (ELBW) which is less than 1000gm. The incidence of LBW in south Asia is 28%. It is estimated that 15% to 20% of all births worldwide are low birth weight, representing more than 20 million births a year. Southern Asia also holds a major for 50% of global low birth weight babies and India being the major part plays a major role in the prevalence[1]. The overall risk factors for LBW are similar to the risk factors for preterm birth[2].

Birth weight is a reliable and sensitive indicator for predicting the immediate or late outcome of a newborn[3,4]. Low birth weight infants are at increased risk of different types of early neonatal complications like birth asphyxia, septicemia, respiratory distress syndrome, hypothermia, hypoglycemia, neonatal jaundice etc[1]. Preterm baby is defined as babies born alive before 37 completed weeks of pregnancy [5].

**Respiratory distress** is defined as presence of at least two of following signs:

- Chest retractions
- Tachypnea (RR-60/min)
- Expiratory grunt/ apnea lasting for more than 2 hrs after birth
- Cyanosis[6].

Due to the weak accessory and intercostal respiratory muscles the neonate compensate by increasing respiratory rate to increase the minute ventilation. The common causes are TTN, RDS, MAS and pneumonia[7]. Certain risk factors increase the likelihood of neonatal RD. Recognized causes of RD in other low and high resource countries includes; prematurity, low first and fifth minute Apgar scores, meconium aspiration syndrome, caesarian section delivery, gestational diabetes, maternal chorioamnionitis, premature rupture of membranes[8]. RD is one of the most common reasons for neonates to be admitted to the neonatal intensive care unit (NICU). Preterm infants are more prone to develop respiratory distress[11,12,13].

#### AIMS AND OBJECTIVES:

To study the incidence and etiology of respiratory distress in low birth

weight neonates taking place at Maharshi Markandeshwar Hospital, Mullana, Ambala.

#### METHODS:

This is a prospective observational study. It was carried out in neonatal division of department Of pediatrics MMIMSR, Mullana. The study included 200 low birth weight neonates born during the study period. This was a hospital based study conducted between May, 2020 till June, 2021.

#### Inclusion Criteria

- Eligible neonates delivered and admitted at tertiary care centre, mullana born with a birth weight less than 2500gm is included.
- Study group is comprised of babies with both term and preterm babies.
- Study group is comprised of only inborn babies of our institution.
- Those who agreed for the consent form.

#### Exclusion Criteria

- Neonates with gross congenital malformations / genetic anomalies.
- Those in whom full data of first 72 hours is not available.
- Babies with outborn deliveries.
- Those who rejected the consent form.

#### Detailed Methodology

The weight of the baby is carried daily on electric weighing machine. All the neonates admitted in NICU are managed as per their pathological issues and conditions. All infants enrolled in the study are followed daily till their final stay in hospital for any morbidity by clinical evaluation and review of hospital records.

#### Statistical Analysis

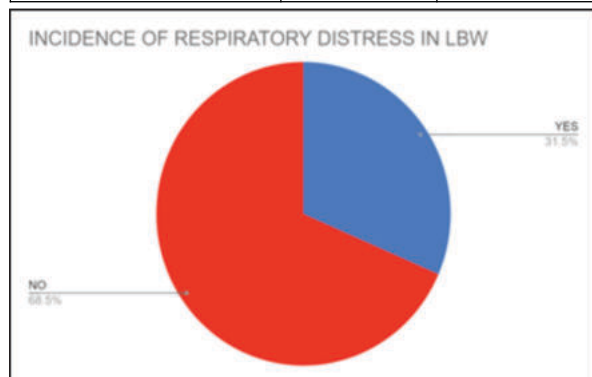
Data is presented as proportions and percentages. Other statistical tests are applied as necessary. All data collected has been analyzed using SPSS software version(25.0).

#### Ethical Consideration

A prior permission from The Institutional Ethics committee was obtained. The study did not impose any financial burden on the parents or guardians of the study group and an informed written consent is taken by the parents/guardians of the participants before conducting the study. All participants are ensured confidentiality.

**RESULTS AND OBSERVATION:****Table 1**

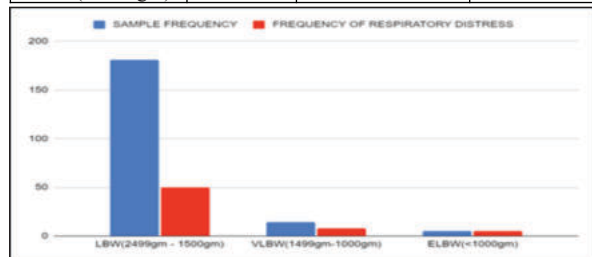
| RESPIRATORY DISTRESS | FREQUENCY | PERCENTAGE |
|----------------------|-----------|------------|
| YES                  | 63        | 31.5%      |
| NO                   | 137       | 68.5%      |
| TOTAL                | 200       | 100%       |

**Figure 1**

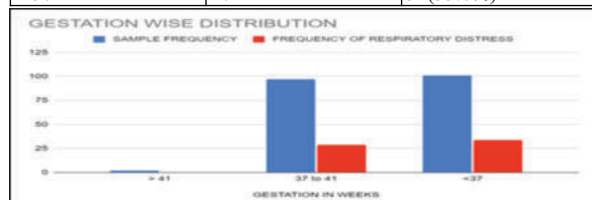
Out of 200 neonates 63 had respiratory distress. The incidence of respiratory distress in index study was 31.5%. According to weight distribution 181(90.5%) were LBW(2499gm - 1500gm), 14(7%) were VLBW(1499gm-1000gm), 5(2.5%) were ELBW(<1000gm) and the incidence of respiratory distress among LBW was 27.6%, VLBW 57.1% and ELBW 100%. According to gestation 2(1%) were post term, 97(48.5%) were term and 101(50.5%) were preterm. The incidence of respiratory distress among term was 29.8% and preterm was 33.6%. The most common cause of respiratory distress was transient tachypnea of newborn(33.8%) followed by hyaline membrane disease(24.1%), sepsis(17.7%), apnea(9.6%), CVS disorder(6.4%).

**Table 2:**

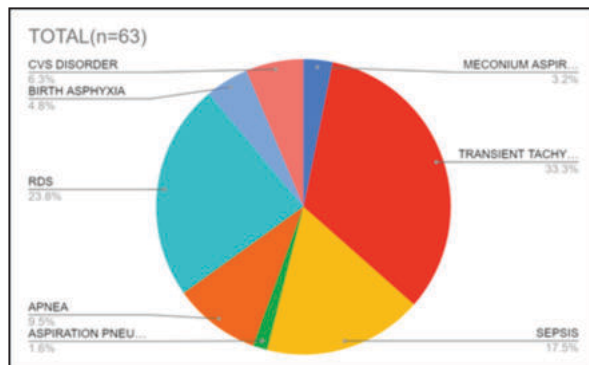
| BIRTH WEIGHT         | FREQUENCY | FREQUENCY OF RESPIRATORY DISTRESS | INCIDENCE |
|----------------------|-----------|-----------------------------------|-----------|
| LBW(2499gm - 1500gm) | 181       | 50                                | 27.6%     |
| VLBW(1499gm-1000gm)  | 14        | 8                                 | 57.1%     |
| ELBW(<1000gm)        | 5         | 5                                 | 100%      |

**Figure 2****Table 3:**

| GESTATION IN WEEKS | FREQUENCY | FREQUENCY OF RESPIRATORY DISTRESS |
|--------------------|-----------|-----------------------------------|
| > 41               | 2         | 0(0%)                             |
| 37 to 41           | 97        | 29(29.8%)                         |
| <37                | 101       | 34(33.6%)                         |

**Figure 3****Table 4**

| ETIOLOGY OF RESPIRATORY DISTRESS | TOTAL(n=63) |
|----------------------------------|-------------|
| MECONIUM ASPIRATION SYNDROME     | 2(3.17%)    |
| TRANSIENT TACHYPNEA OF NEWBORN   | 21(33.33%)  |
| SEPSIS                           | 11(17.46%)  |
| ASPIRATION PNEUMONIA             | 1(1.5%)     |
| APNEA                            | 6(9.5%)     |
| RDS                              | 15(23.8%)   |
| BIRTH ASPHYXIA                   | 3(4.76%)    |
| CVS DISORDER                     | 4(6.3%)     |

**Figure 4****DISCUSSION:**

In my study the incidence of respiratory distress among low birth weight neonates was 31.5%. A near by similar result was seen in Bandyopadhyay S[9] with 39.8%. Arty Tyagi,et.al[10] study showed lesser incidence with 19.78% with more among the preterm low birth weight neonates.

In the index study the incidence of respiratory distress among birth weight categories showed <1000gm with 100%, 1000 to <1500gm with 57.1% and 1500 to <2500gm with 27.6%. Other study had a result of <1000gm with 52.6%, 1000 to <1500gm with 37.3% and 1500 to <2500gm with 39.2%[9].

Among term low birth weight in our study the incidence was 29.8% and in preterm the incidence was 33.6%. In other study a similar result was seen with 32.39% in preterm but lesser incidence was seen in term low birth weight neonates with 6.1%[10].

In the etiology of respiratory distress, transient tachypnea of newborn showed the maximum incidence and similar result was seen among study by CHRISTIAN L,et.al[12] and JOHN J. MORRIS,et.al[11]. The earlier studies done by K NAGENDRA,et.al[13] showed maximum incidence in RDS, however the scientific advancement and effective antenatal steroid management have helped in reducing incidence of RDS as per recent studies[10,11,12].

In our study RDS is the 2<sup>nd</sup> main etiology of respiratory distress and similar results seen in study by JOHN J. MORRIS,et.al[11]. The RDS was seen more in the preterms and similar results were seen in other studies also by K NAGENDRA,et.al, CHRISTIAN L,et.al and JOHN J. MORRIS,et.al[10,11,12].

The scientific advancement and antenatal supervision with earlier management of maternal diseases, improved obstetrical and neonatal risk factors will eventually reduce the incidence of respiratory distress in newborn.

**CONCLUSION:**

Low birth weight and preterm deliveries are at higher risk for morbidity during and after the birth. Early referral of high-risk pregnancies to the tertiary care centers will greatly reduce the incidence of respiratory distress syndrome in neonates. The incidence increases as birth weight and gestation decreases in neonates. Due to recent medical advances and skilled clinical practice the incidence of RDS has decreased. Transient tachypnea of newborn remains the main etiology of respiratory distress in neonates.

**Financial Support And Sponsorship:** Nil

**Conflicts Of Interest:** There are no conflicts of interest

**Limitations:**

The limitation of this study is that the participants are relatively less in frequency. Thus the result of this thesis cannot be applicable on a larger population. The study does not include the outborn babies. The study is limited to low birth weight category.

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