



Etiological Profile And Outcome Of Neonatal Respiratory Distress In A Tertiary Care Hospital

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Abstract

Introduction: Respiratory distress is a common reason for neonatal unit admission. Early detection of respiratory distress and beginning of suitable therapy are critical for achieving the best possible results. One of the most common causes of morbidity in newborns is respiratory distress. The purpose of this study is to look at the risk factors of neonatal respiratory distress, determine the common causes respiratory distress in newborns, and evaluate the immediate clinical outcome of respiratory distress in neonatal intensive care unit of a tertiary care hospital.

Material and Methods: A prospective study was conducted at Tertiary Care Hospital in duration of 18 months. Study includes 200 cases maximum during the study period. Term, pre-term and postterm babies both in-born and out-born cases were included in the study. They were kept under constant supervision till discharge or death and treatment for specific indication was given. Data was collected using predesigned proforma fulfilling objectives of study.

Results: Of the 190 cases admitted with respiratory distress, 77.36%(n=147) of respiratory distress in neonates was respiratory in origin. Respiratory distress syndrome is the most common cause, followed by transient tachypnea of newborn followed by congenital pneumonia. Mortality being 18.42%(n=35), with majority neonates admitted for respiratory distress requiring O2 support. The outcome of neonatal respiratory distress was found as a survival rate of 81.58% and mortality rate of 18.42%

Conclusion: One of the most prevalent reasons for NICU admission is respiratory distress. In term babies, transient tachypnea is the most prevalent cause of respiratory distress and preterm babies are more likely to have hyaline membrane illness. Majority of neonates survive with timely diagnosis and treatment.

Keywords: Hyaline Membrane Disease, Neonatal Respiratory Distress, Prematurity, Respiratory Distress Syndrome

Introduction:

One of the most prevalent reasons for NICU admission is respiratory distress. The incidence of neonatal respiratory distress (RD) ranges from 2.2% to 7.6% in developed countries and from 0.7% to

8.3% in India [1]. Neonatal respiratory illness is more likely when certain risk factors are present, prematurity, meconium-stained amniotic fluid (MSAF), caesarean birth, gestational diabetes, maternal chorioamnionitis, or prenatal

ultrasonographic signs such oligohydramnios or structural lung abnormalities. Respiratory discomfort, regardless of the reason, can swiftly progress to respiratory failure if not diagnosed and treated. One or more of the following signs may be present in the clinical presentation of respiratory distress in newborns: apnea, retractions (subcostal, intercostal, xiphoid, suprasternal), grunting, nasal flaring, and cyanosis.[2] Respiratory distress can be caused by a variety of respiratory system disorders such as newborn transient tachypnea, hyaline membrane disease, meconium aspiration syndrome, pneumonia, septicemia, persistent pulmonary hypertension, and non-respiratory disorders such as cardiac, neurological, infectious, metabolic, and congenital anomalies. Transient tachypnea of new borns is the most common cause of respiratory distress in term babies, while Hyaline membrane disease is the most common cause in preterm babies.[3] Premature birth can be avoided by recognising foetal distress early, identifying maternal risk factors. Early diagnosis and treatment of neonatal respiratory disease has yielded excellent results. Resuscitation, oxygenation, surfactant replacement, and ventilation are all common treatment procedures, albeit their effectiveness varies according to the ailment. The introduction of Continuous Positive Airway Pressure and Ventilators has changed the course of neonatal respiratory failure.

material and methods:

This was an observational prospective study conducted in the NICU of Government Hospital,a tertiary care hospital. The study was carried out in time period of 18 months after obtaining Institutional Ethics Committee approval. All Inborn and Out born Neonates with respiratory distress were enrolled in the study after obtaining written informed consent from parents of babies.

Inclusion Criteria:

Both in-born and out-born neonates admitted to NICU with respiratory distress.

Exclusion Criteria:

Babies more than 28 days

Multiple congenital malformation

Data Collection: A detailed proforma including name, age, sex, and residence was obtained. Neonatal data was recorded including weight of the baby, gestational age, mode of delivery, APGAR score, if available, the need for resuscitation after birth, onset of respiratory distress and resolution of respiratory distress. Factors related to type of deliveries were assessed, normal vaginal or Caesarean section, any associated complications like; prolonged rupture of the membranes more than 24 h, prolonged labor, meconium stained liquor, antepartum hemorrhage and others. Maternal information was recorded including age, parity and any systemic diseases. The cases were diagnosed clinically by the presence of at least 2 of the following criteria, namely RR of 60/min or more, subcostal in drawing, and supra sternal in drawing, flaring of alae nasi, expiratory grunt and cyanosis.The diagnosis of clinical conditions producing respiratory distress (RD) was based mainly on careful scrutiny of the history, clinical and radiological findings.

Results:

The most common maternal risk factor was found out to be PerVaginal leak >12 hours. 21.05% neonates were found to be born to mothers with PV leak for >12 hours, whereas 27.89%(n=53) neonates were found to be born to mothers with no associated risk factors.

RISK FACTOR	N	%
PIH	15	7.89%
PRE-ECLAMPSIA	24	12.63%
IMPENDING ECLAMPSIA	9	4.73%

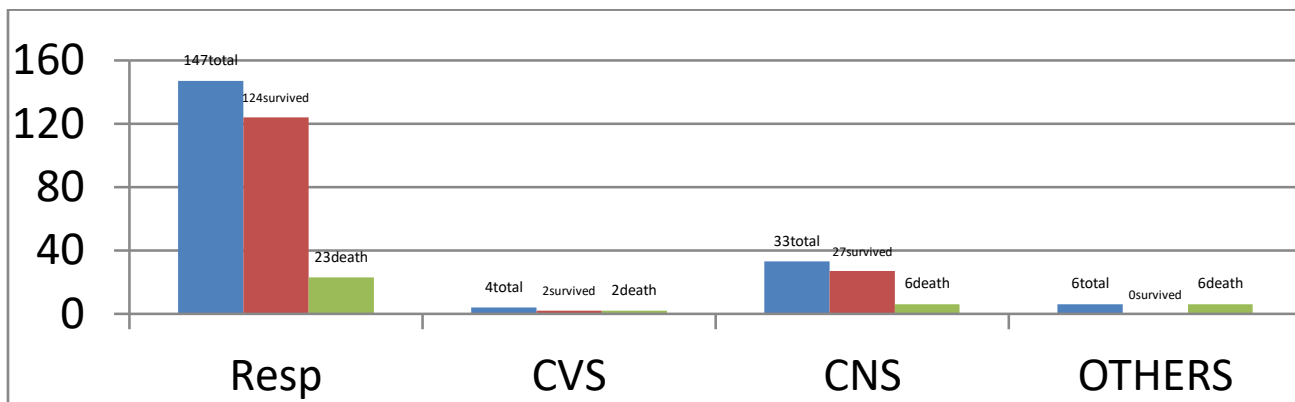
PROM	15	7.89%
PV LEAK FOR >12 HOURS	40	21.05%
DIABETES MELLITUS	5	2.63%
CPD	11	5.78%
PROLONGED LABOUR	10	5.26%
CERVICAL INCOMPETENCE	8	4.21%
NONE	53	27.89%

Table 1: Maternal risk factors for respiratory distress in newborns

77.36% (n=147) of respiratory distress in neonates was respiratory in origin. Respiratory distress syndrome is the most common cause, followed by transient tachypnea of newborn followed by congenital pneumonia.

Cause of respiratory distress	N	%
Respiratory	147	77.36%
Cardiac	4	2.10%
Central nervous system	33	17.36%
Surgical	6	3.15%

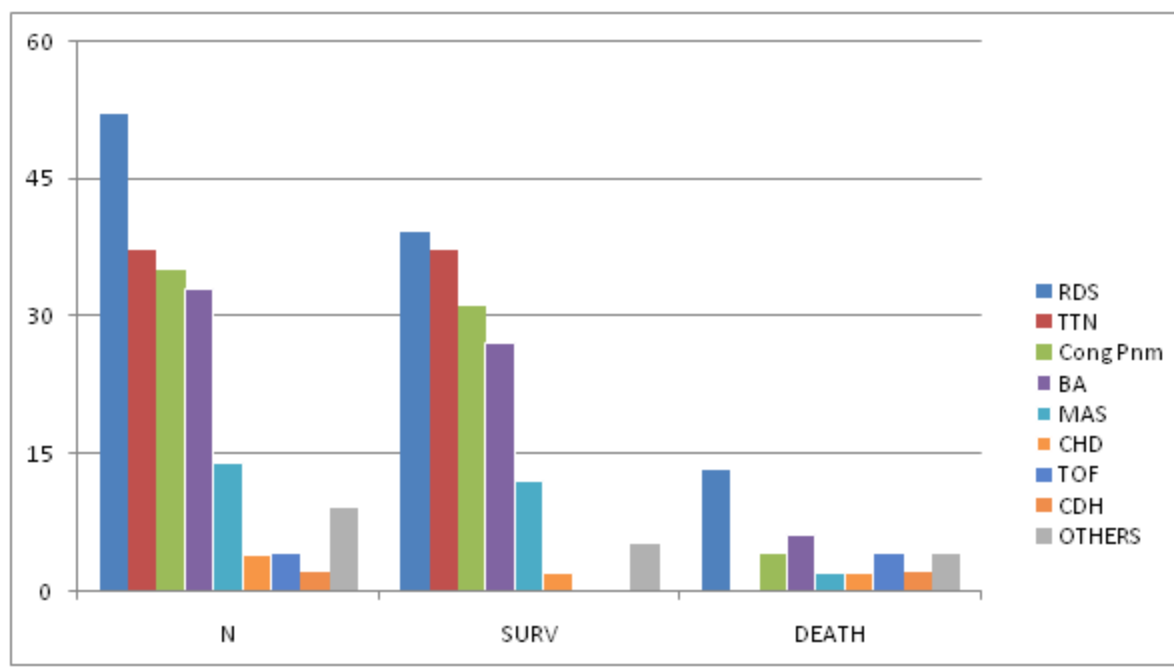
Table 2: Etiology of respiratory distress (RD) in newborn



Graph 1: Etiology of respiratory distress (RD) in newborn

Cause of respiratory distress	N	%	Survival	%	Death	%
Respiratory distress syndrome	52	27.36%	39	75%	13	25%
Transient tachypnea of newborn	37	19.47%	37	100%	0	0%
Congenital Pneumonia	35	18.42%	31	88.57%	4	11.43%
Birth asphyxia	33	17.36%	27	81.81%	6	18.19%
Meconium Aspiration Syndrome	14	7.36%	12	85.71%	2	14.29%
Congenital Heart Disease	4	2.10%	2	50%	2	50%
Tracheo-oesophageal fistula	4	2.10%	0	0%	4	100%
Diaphragmatic Hernia	2	1.05%	0	0%	2	100%
Others (pulmonary hemorrhage, PPHN, laryngomalacia)	9	4.73%	5	55.55%	4	44.45%

Table 3: Etiology of respiratory distress (RD) in newborn

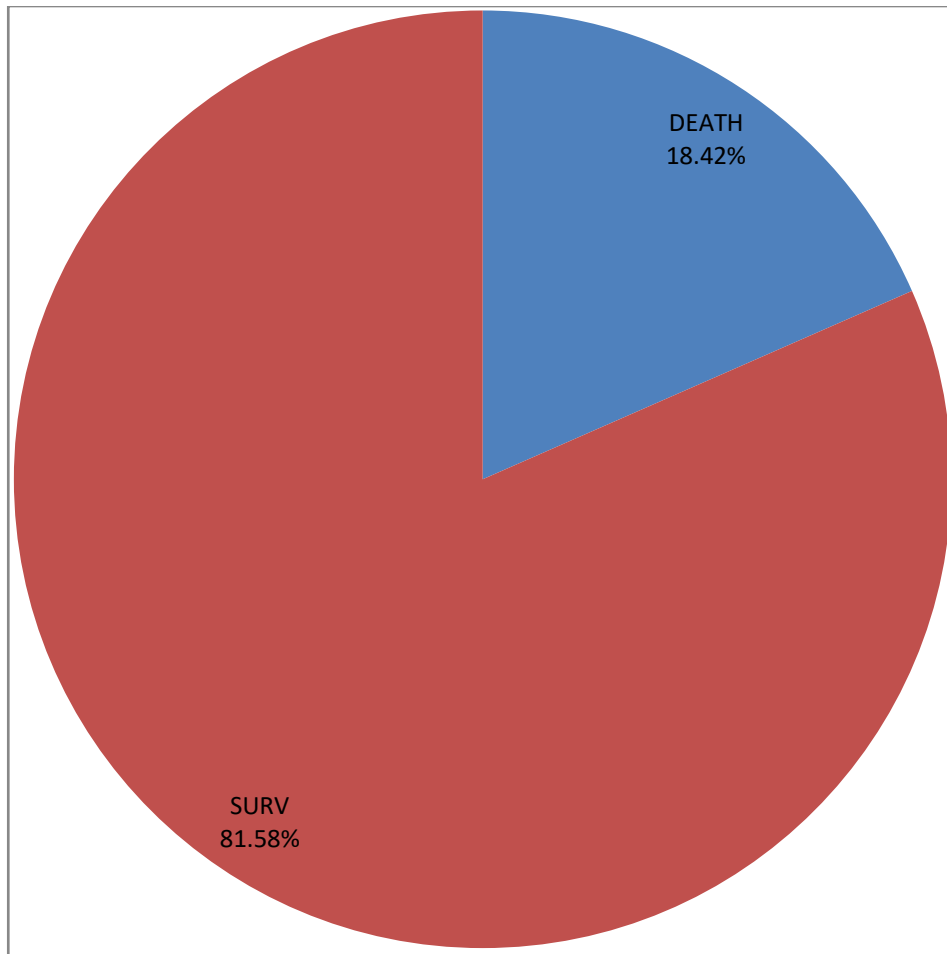


Graph 2: Etiology of respiratory distress (RD) in newborn

The outcome of neonatal respiratory distress was found as a survival rate of 81.58% and mortality rate of 18.42%.

Outcome	N	%
DEATH	35	18.42%
SURVIVAL	155	81.58%

Table 4: Outcome of neonatal respiratory distress



Graph 3: Outcome of neonatal respiratory distress

There were 70 (35%) term, 120 (60%) preterm who were admitted with respiratory distress. Most common etiology of respiratory distress (RD) was Hyaline membrane disease (27.36%) followed by TTNB (19.47), MAS (7.36%), Congenital pneumonia(18.42%),, birth asphyxia (17.36%), Congenital heart diseases (2.10%)

Oxygen therapy with CPAP was required in 41.06% and 23.16% were treated with mechanical ventilation.

Mortality rate was higher in male neonates admitted for respiratory distress in NICU, with p value being 0.34, not statistically significant. Mortality rate was less as compared to survival with 18.42%(n=35) of neonates not surviving even with appropriate treatment. Survival was highest in neonates weighing 2.5 kg to 3.5kg, with 86.53% surviving, and mortality was highest in neonates weighing <1000 gm with mortality being 28.57%. 100% mortality was observed in 26-28 wks neonate, whereas mortality

was least in neonates with gestation age of 36-38 wks (10%).

Mortality was higher in neonates who required prolonged resuscitation at the time of birth (74.28%)

Discussion:

In the present study, respiratory distress syndrome is the most common cause, followed by transient tachypnea of newborn followed by congenital pneumonia..Present study had similar findings with studies like_Guyon_G et al[4], Rubaltella FF[5], C Dani[6], Reali M F et al but studies by Nagendra K et al[7], T.S. Raghu Raman et al[8],Kumar et al[9],showed contrary findings. 41% of respiratory distress was due to transient tachypnea of newborn according to a study by Tudehope and Smith[10].According to a study conducted by Swarnakar et al[11], the most common causes of RD in their study were TTNB (40.7%), RDS (17.2%), birth asphyxia (11.4%), and MAS (9.3%).

Respiratory Distress Syndrome was found to be the most common cause of mortality in a study conducted by Ravindra et al[12].

In a study by Rubaltelli. FF[5] 208 died (14.6%). Incidence of respiratory distress syndrome 1.16%, case fatality rate 24%, incidence of transient tachypnea of newborn 0.93%, case fatality rate of 1.3%, incidence of meconium aspiration syndrome 0.06%, case fatality rate of 10.3%, incidence of persistent pulmonary hypertension 0.02% , case fatality rate 38.5%, incidence of pneumonia 0.07%, case fatality rate 21.7% .

Most common cause of respiratory distress was respiratory distress syndrome in both inborn and outborn neonates in a study by Rakholia et al. In inborn neonates second most common cause was birth asphyxia (17%) and in outborn neonates sepsis.[13]

According to Malhotra A K hyaline membrane disease accounted for 88% mortality, birth asphyxia accounted for 66% mortality, sepsis and pneumonia for 50% mortality and all cases of transient tachypnea of newborn and meconium aspiration syndrome survived. Most number of deaths were below 2.5kgs. Respiratory distress accounted for 13.7% of all NICU admissions.[14]According to Hermansen CL et al Transient Tachypnea of newborn is the most common cause of respiratory distress in neonates constituting more than 40% of cases. [15]

According to Sauparna C et al sepsis(pneumonia) was the most common cause of respiratory distress in neonates(38.9%),followed by respiratory distress syndrome(23%),meconium aspiration

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syndrome(20.5%), transient tachypnea of newborn(10%), congenital heart disease(6%), congenital diaphragmatic hernia(1%) and pulmonary haemorrhage(1%).[16]

51% survived among ventilated babies in a study done by Kulkarni M L et al.[17] .Singh N and Prasad V et al had mortality rate of 18.69% which is lower as compared to Das N et al study in Pakistan.[18][19]. Mortality rate was 22.86% in study done by Keerti Swarnkar[11] .In the present study most common risk factor is PV leak for > 12 hours. No risk factors were observed in 44.5% cases in a study by P. Brahmaiah. [20]

For respiratory distress syndrome main identifiable risk factors are gestational diabetes and chronic hypertension. For the influence of maternal hypertension on the incidence of respiratory distress Kwang sun Lee et al[21] studied a group of 412 infants with birth weights less than 2500gms and gestational age less than 36 weeks. In a study done by C.Dani similar findings were confirmed.[6] Risk of developing respiratory distress in newborn were not related to gestational or chronic diabetes, pregnancy induced or chronic hypertension as found by M.Lureti[22]

Conclusion:

Anticipation for neonatal respiratory distress according to maternal risk factor,early detection and appropriate management according to cause for respiratory distress whether respiratory,cardiac,birth asphyxia or any other is essential to ensure better outcome in all neonates presenting with respiratory distress.

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