

To Study Etiological Profile of Respiratory Distress in Newborn

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Abstract: Respiratory distress is symptom complex in newborn include one or more of the following features, respiratory rate >60/min, retraction (intercostal, xiphoid, sub costal, superasternal), grunting, cyanosis, nasal flaring, apnea. Main cause for admission were TTNB which is seen in term babies predominantly, most of babies responds to oxygen by good and conventional CPAP, mortality is highest due to RDS in respiratory distress newborn. Respiratory distress in newborn is diagnostic and management challenge. Newborn with respiratory distress commonly present with tachypnea with increase respiratory rate more than 60/min. They may present with retractions, grunting, nasal flaring and cyanosis. Common cause include TTNB, respiratory distress syndrome, meconium aspiration syndrome, pneumonia, sepsis, persistent pulmonary hypertension of newborn, pneumothorax and delayed transition.

Keywords: Respiratory disease, tachypnea, meconium aspiration syndrome, transient tachypnea of newborn, hyaline membrane disease, birth asphyxia, pneumonia

1. Background & Aim

Respiratory distress is one of the commonest causes of mortality and morbidity in neonatal period. Respiratory distress affect up to 7% of all term newborn its common reason an infant admitted to the neonatal ward^{1, 2}. It is encountered within the first 48-72 hours of life. Respiratory distress is symptom complex in newborn include one or more of the following features, tachypnea, retraction on (intercostal, xiphoid, sub costal, superasternal), grunting, cyanosis, nasal flaring, apnea³. Normally, the newborn's respiratory rate is 30 to 60 breaths per minute. Tachypnea is defined as a respiratory rate greater than 60 breaths per minute³. Respiratory distress arising by failure to maintain gaseous exchange⁴. Severity of respiratory distress in preterm babies is assessed by Anderson-silverman score and in term babies is assessed by downe score. The spectrum of respiratory distress in neonates includes pneumonia, Respiratory distress syndrome (RDS), meconium aspiration syndrome (MAS), transient tachypnea of newborn (TTNB), sepsis, congenital heart disease (CHD), some surgical pathology of the lungs, esophagus and diaphragm and other miscellaneous causes⁵. According to National Neonatal and Perinatal database, Pneumonia constitutes 2.5% of neonatal deaths⁶. Commonest cause of respiratory distress in preterm babies is Hyaline membrane disease and in term babies is Transient tachypnea of newborn⁵. Prevention of premature birth, identification of maternal risk factor, early recognition of fetal distress and diagnosis of diseases in utero will further improve neonatal outcome. Early recognition and proper treatment of respiratory distress has good results. Treatment is specific to the disease responsible for respiratory distress, common Treatment modalities includes oxygenation, ventilation, Resuscitation, Surfactant. Ventilators and Continuous Positive Air way pressure have revolutionized the outcome of respiratory failure in neonates. Hence the present study was conduct to find out

incidence, causes, clinical features, complication and outcome of respiratory distress in inborn neonates.

2. Method

A hospital based prospective study was carried out for period of 6 month in the NICU, department of pediatrics, C U Shah Medical College, surendranagar. Patient presented with retraction, tachypnea, nasal flaring, grunting were admitted in NICU and treated. The gestational age and weight of the baby was recorded. Information regarding gender, previous pregnancies, previous abortions if any, mode of delivery, complications during delivery, need of resuscitation, feeding patterns of the newborns were noted. Respiratory rate was counted for one minute when baby was in quiet state. Respiratory distress was diagnosed clinically by the presence of 2 of the following criteria, chest in-drawing (inter-costal, sub-costal, supra-sternal retractions), RR>60/min, expiratory grunt and cynosis at room air⁷. They were then assessed by Silvermann Anderson score and downe scoring system. History of maternal fever> 38°C, meconium stained amniotic fluid, foul smelling liquor, prolonged rupture of membrane (PROM) 24 hours were taken. Vitals were recorded, continuous monitoring of heart rate, oxygen saturation was done by pulse oxymeter. Chest X ray was done in all babies. X ray chest was interpreted as per suggested criteria. Blood glucose was monitored and sepsis work up was done. Diagnosis of cause of respiratory distress was based on guideline recommended by the National Neonatology Forum. First line antibiotics were started in the neonates if there were associated risk factor on non resolution of symptoms within 24 hours. Ventilation (SIMV-synchronized intermittent mechanical ventilation) for score >6.

Inclusion Criteria

All inborn newborn babies admitted to NICU for respiratory symptoms were included in the study.

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Exclusion Criteria:

- 1) Babies > 28 days,
- 2) Babies with congenital malformations like anencephaly, meningocele, meningomyelocele, encephalocele, etc
- 3) Babies treated outside and referred to government hospital,
- 4) Babies with birth weight of <700 gm.

3. Result

During this study period newborn were admitted which developed feature of respiratory distress. It constituted 26.06% of all SNCU admission (422) during the period. There were 62 (56.36%) male and 48 (43.64%) were females. transient tachypnea of the newborn (TTNB) was the most common cause (36.36%) of respiratory distress, 2nd most common cause is Respiratory Distress Syndrome (RDS) (30.9%), sepsis & pneumonia (25.45 %), Meconium Aspiration Syndrome (MAS) (5.45%), and Birth Asphyxia (1.81%). TTNB was more common on term babies, MAS was found exclusively in the term babies, RDS among preterm babies 28 (25.45%) babies responded to only O₂ by hood, 40 babies (36.36%) responded to O₂ conventional CPAP, 24 babies (21.61%) required machine cpap and 18 babies (16.36%) had to be managed by mechanical ventilation. Out of 28 pneumonia cases sepsis was positive in 27 newborn (96.42%) and blood culture was positive in 12 newborn (44.44%). The most common organism was in 5 cases (17.85%), acinetobacter in 3 cases (10.71%), followed by CoNS in 2 cases (7.14%) and E.coli 2 cases (7.14%). In the pneumonia cases, in maternal history PROM was detected in 7 cases (25%), maternal fever in 4 cases (14.28%) and foul smelling liquor in 11.1%. The overall case fatality is (18.18%). Mortality is highest in RDS which is 50 % of total mortality, 30 % of the total mortality due to pneumonia, 15% of mortality due to meconium aspiration syndrome and 5% due to birth asphyxia.

Table 1: Etiology and incidence of respiration distress

Cause	No of causes	Percentage (%)
TTNB	40	30.9
RDS	34	30.9
Pneumonia	28	25.45
MAS	6	5.45
Birth asphyxia	2	1.81

Table 2: Gestational age wise distribution of cases

Cause	<37 weeks		>37 weeks		Total
	N	%	N	%	
TTNB	8	20	32	80	40
RDS	26	76.47	8	23.52	34
Pneumonia	18	64.28	10	35.71	28
MAS	-	-	6	100	6
BA	-	-	2	100	2

Table 3: Blood culture in pneumonia

Blood culture	N	(%)
Sterile	16	57.14
Positive	12	42.86
Total	28	100

Table 4: Spectrum of organism in blood culture positive cases

Organism	N (%)
Klebsiella	5 (17.85 %)
Acinobacter	3 (10.71%)
Cons	2 (7.14%)
E.coli	2 (7.14%)
Total	12 (42.86%)

Table 5: Mortality due to respiratory distress

Causes	Percentage	Number
RDS	50%	10
Pneumonia	30%	6
MAS	15%	3
BA	5%	1
Total		20

Table 6: Types of O₂ support in respiratory distress in newborn

Type	Number	Percentage
By hood	28	25.45%
By conventional cpap	40	36.36%
By machine cpap	24	21.61%
By ventilator machine	18	16.33%
Total	110	

4. Discussion

Respiratory distress in newborn is diagnostic and management challenge. Newborn with respiratory distress commonly present with tachypnea with increase respiratory rate more than 60/min. They may present with retractions, grunting, nasal flaring and cyanosis. common cause include TTNB, respiratory distress syndrome, meconium aspiration syndrome, pneumonia, sepsis, persistent pulmonary hypertension of newborn, pneumothorax and delayed transition. Serial complete blood counts, blood culture, C-reactive protein, chest x ray are useful for the evolution of sepsis. Most neonates with respiratory distress can be treated with noninvasive methods and respiratory support. Oxygen can be provided via oxygen hood, oxygen nasal cannula, conventional Cpap and machine Cpap. Most common presentation was tachypnea. The most common casuse includes TTNB, RDS, MAS, sepsis and pneumonia. Newborn with RDS develop chronic lung disease or bronchopulmonary dysplasia. Newborns with bronchopulmonary dysplasia may have nutritional failure, have neurodevelopmental delay and require oxygen for longer period of time with higher hospital readmission rates. Surfactant, antenatal steroids and advanced respiratory care of the newborn have improve the outcome of the babies who are affected by respiratory distress syndrome, it continues to be the leading cause of morbidity and mortality in preterm infant.

5. Conclusion

Respiratory distress is one of the commonest causes of admissions in NICU. Out of total admission it constitute of 25.88% of all admission. TTNB is the most common cause of respiratory distress in term babies and HMD is common in preterm babies. Mortality was 18.18% due to respiratory cause and most common cause was Respiratory distress syndrome and 2nd most common cause pneumonia. Presence of maternal risk factor like PROM, and foul smelling liquor predispose to neonatal pneumonia and hence need early

intervention. Most patient's response to oxygen by conventional CPAP and nasal cannula.

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