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CLINICAL PROFILE AND OUTCOME OF RESPIRATORY DISTRESS IN NEWBORNS

Paediatric Medicine

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ABSTRACT

Background- Respiratory distress is the most common cause for NICU admissions. It is important to conduct regular studies to follow the trends of clinical profile and outcome of newborns developing respiratory distress.

Methods: This study was conducted on respiratory distress in newborns. All the newborn with clinically diagnosed RD and age less than 28 days were enrolled in the study and followed until their outcome.

Results: Overall mortality among cases of respiratory distress was 28%. Occurrence of causes of respiratory distress in newborns with final outcome was statistically significant ($p<0.001$) in all risk factors except maternal anaemia.

Conclusion: Neonatal care should be improved by routine presence of pediatrician at the time of delivery so that possible preventive measures for respiratory distress can be taken at the time of delivery and afterwards.

KEYWORDS

RDS, MAS, CPAP

INTRODUCTION

Respiratory distress is a symptom complex arising from disease process that causes failure to maintain adequate gaseous exchange in the lungs. [1] Disorders such as meconium aspiration syndrome, hyaline membrane disease, congenital pneumonia, transient tachypnoea of newborn, perinatal asphyxia are known to cause respiratory distress in neonates. Non-respiratory causes such as congenital heart diseases, septicemia, congenital malformations and metabolic disorders can also cause respiratory distress.

The management of RD lies in prompt evaluation, assessment, and treatment of the causative factors. Recent advancements in the healthcare system allow newborns with respiratory distress to be treated with mechanical ventilation, CPAP (continuous positive airway pressure), surfactant replacement therapy and phototherapy that can make a significant difference in the prognosis if used according to standard protocols. [2]

METHOD

Study Design – This is a hospital-based observational study.

Study Aims And Objectives –

To estimate the proportion of newborns admitted with RD among all NICU admissions, to find out the most common etiologies responsible for RD in newborns and to study the management and the outcome of these newborns.

Study Place – RDBP Govt. Jaipuriya Hospital , RUHS Medical college Jaipur.

Study Duration – from may 2021 to nov 2021.

Study Inclusion And Exclusion –

Inclusion Criteria –

All inborn and outborn newborns with RD (assessed by either Downe's or Silverman Anderson scoring system).

Exclusion Criteria –

New born not fulfilling the criteria of RD with either Downe's or Silverman-Anderson scoring system.

Method of data collection –

All newborns admitted to NICU RDBP Govt jaipuriya hospital. All inborn and outborn (private hospital and community hospital), as well as home, delivered babies who developed respiratory distress within 28 days of birth were assessed based on either Downe's scoring system or Silverman-Anderson scoring system or both.

The basic clinical diagnosis of respiratory distress is made when atleast 2 of the following criteria, namely respiratory rate >60/minute, retractions (sub-coastal, xiphoid and suprasternal recession), grunting, flaring of the nasal alae and cyanosis at room air and temperature on two consecutive occasions at least an hour apart, were met.

The demographics of newborns were noted on a pre-structured proforma which included characteristics such as name, sex, age at admission, gestational age, birth weight, mode of delivery, place of birth, post-natal history, etiological diagnosis, treatment given in NICU, length of NICU stay and outcome of RD.Gestational age was calculated using ultrasonography reports (if available) or Ballard's scoring system, clinical symptoms were assessed bedside and other variables were noted from the documents brought by the parents from the place of birth.

All the neonates were kept under constant supervision according to the treatment and management protocols of the hospital until their outcome death, discharge, leave against medical advice (LAMA) or referral to a higher centre.

Statistical Analysis –

All the data were collected, and tabulated in Microsoft Excel and analysed via the SPSS program (version 23). Comparison of data was done appropriately using respective tests.

RESULTS

Table 1: Comparative table of various respiratory signs and symptoms according to causes of respiratory distress.

Signs and Symtoms	TTN n=196 (%)	HMD n=145 (%)	Sepsis/ Pneumonia n=116 (%)	MAS n=56 (%)	HIE n=45 (%)	CHD n=24 (%)	Other n=18 (%)	P value
Respiratory Rate(RR)>60	196 (100)	143 (98.62)	105 (90.51)	56 (100)	45 (100)	24 (100)	18 (100)	P=0.00
Chest Retraction	180 (91.83)	136 (93.79)	82 (70.68)	50 (89.28)	21 (46.66)	18 (75)	11 (61.11)	0.000

Flaring OfAIaeNasi	172 (87.75)	120 (82.75)	89 (76.72)	51 (91.07)	22 (48.88)	16 (66.66)	13 (72.22)	0.000
Grunting	60 (30.6)	90 (62.06)	48 (41.37)	22 (39.28)	6 (13.33)	4 (16.66)	6 (23.33)	0.000
Cyanosis	3 (1.53)	56 (38.62)	35 (30.17)	7 (12.5)	7 (15.55)	13 (54.16)	5 (27.77)	0.000
Cough	0	0	24 (24.13)	0	0	0	2 (11.11)	0
Adventitious Sounds	0	10 (6.89)	41 (35.34)	14 (25)	0	9 (37.5)	3 (16.66)	0.000

Table 1 comprises the number and percentage occurrence of respiratory signs and symptoms in various causes of respiratory distress RR > 60/mm, flaring of alacnasi and chest retractions had maximum incidence in all the six groups. While cyanosis was most common in CHD and cough was most common in Sepsis including pneumonia. Adventitious sound on chest auscultation were found in maximum number in cases of sepsis including pneumonia (n=41, 35.34%) and in CHD (n=9, 37.5%).

Table 2: Comparative table of antenatal risk factors and their percentage wise occurrence in various causes of respiratory distress.

Antenatal risk factors	TTN n=196 (%)	HMD n=145 (%)	Sepsis/ Pneumonia n=116 (%)	MAS n=56 (%)	HIE n=45 (%)	CHD n=24 (%)	Others n=18 (%)	P value
Antepartum Maternal Fever	-	10 ()	25	3	5()	1 ()	2	<0.001
Prolonged Rupture Of Membranes> 24 Hours	-	16()	30	4	6()	-	1	<0.001
Leaking Per Vaginum	-	18()	35	2	8()	-	2	<0.001
H/O Diabetes in Mother	5	6	1	-	-	1	-	<0.01
H/O Maternal/Renal/Lung disease	-	4()	1()	3	2()	-	2	<0.001
H/O HTN in mother	-	10	1	6	33	-	1	<0.01
H/O Maternal Anemia	20	18	6	4	3	1	2	0.446
PV Examination single unclean or > 3 sterile	3	15	45	10	4	1	3	<0.001
H/O Foetal distress	-	2	10	32	20	8	4	<0.001
Past H/O Neonatal mortality or morbidity	6	15	2	-	4	1	2	0.005

Table 2 of antenatal risk factors highlights prolonged rupture of membranes, maternal fever, leaking per vaginum and single unclean or >3 sterile PV examinations as a significant factor contributing to sepsis including pneumonia in neonates. A small proportion of babies of HMD and HIE had preceeding history of prolonged rupture of membrane and leaking per vaginum in mothers. That could be because both rupture of membrane and leaking per vaginum itself can lead to preterm labour and birth and hypoxic insult to the baby during the entire course of labour.

A history of fetal distress leading to emergency LSCS was found in 32 cases of meconium aspiration syndrome. HTN in mother was commonly found in HIE and few cases of HMD and MAS. Maternal Diabetes was found to be associated with TTN and HMD. Maternal anemia was a common antenatal history in cases of TTN and HMD. Occurrence of causes of respiratory distress in newborns according to antenatal risk factors was statistically significant ($p<0.01$) in all risk factors except maternal anaemia.

Table 3: Final outcome among various causes of respiratory distress

Disease	TTN n=196 (%)	HMD n=145 (%)	Sepsis/ Pneumonia n=116 (%)	MAS n=56 (%)	HIE n=45 (%)	CHD n=24 (%)	Others n=18 (%)	Total n=600 (%)
Expired cases	0	69 (47.58)	49 (42.24)	20 (35.71)	16 (35.55)	8 (33.33)	6 (33.33)	168 (28)
Discharged / Referred	196 (100)	76 (52.41)	67 (57.75)	36 (64.28)	29 (64.44)	16 (66.66)	12 (66.66)	432 (72)

Chi-square = 119.00 ; p<0.001

Table 3 show fatality in neonates among various study groups. Morality figures were 47.58% for HMD, 42.24%for sepsis, 35.71% for MAS, 35.55% for HIE and 33.33% for cases of CHD in our study. Overall mortality among cases of respiratory distress was 28%. Occurrence of causes of respiratory distress in newborns with final outcome was statistically significant ($p<0.001$) in all risk factors except maternal anaemia.

DISCUSSION

The morality rate for MAS was 30% by S.P. Khatua[3] and 50% by Mathur[4] et al were Pneumonia (22.4%), MAS (14.5%) and HMD (100%). High morality was seen in cases of HMD in this region. This may be due to less use of surfactant due to non affordability 43.1% of babies with HIE expired. This is more than being reported from NNPD (2002-2003) which shows 20% of all neonatal death due to HIE.

In the study by SP Khatua[40], the incidence of morbidity and mortality of respiratory distress amongst various birth weights was In our study Low birth weight, prematurity, need for resuscitation, high downe score, evidence of sepsis, provision of ventilatory support FiO_2>40% was related to mortality with statistically significant relationship. In a study conducted by **Rajavarapu Chandrasekhar et al (2016)**[5] risk factors which found to be statistically significant ($p<0.05$) were age of mothers, socio economic status, parity, liquor, mode of delivery, gestation of baby, 1min APGAR score, birth weight and sex of the newborn.

Overall 57.5% cases of respiratory distress were discharged/referred within 7 days with 43% out of them within 3 days. Duration of admission was less than 7 days in all cases of TTNB with < 3 days in 92.3% cases out of them. About 81.5% cases of HMD, 88% cases of Sepsis/pneumonia, 87.5% cases of CHD and 62% cases of HIE were admitted for > 7 days. Sayid M Barkiya et al[6] in their study observed thatthe respiratory distress resolved on the 2nd day (29%) and 3rd day (27%). However, it took more than 4 days to resolve in 41% of cases.

CONCLUSION

Neonatal care should be improved by routine presence of pediatrician at the time of delivery so that possible preventive measures for respiratory distress can be taken at the time of delivery and afterwards.

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