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Original Research Article

Etiological profile of respiratory distress in first day of life of a newborn baby

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ABSTRACT

Background: Respiratory distress in neonates is one of the important clinical manifestations of a variety of disorders of the respiratory system and non-respiratory disorders. It has been estimated that 40-50% of all the perinatal deaths occur following respiratory distress. The objective of this study was to estimate the proportion of respiratory distress in the new-born period. And know the etiological factors of respiratory distress in first day of life and to study the first day of life morbidity and mortality of respiratory distress in NICU.
Methods: All newborn babies admitted to King George Hospital NICU during a period of 1 year from July 2014 to July 2015 who developed respiratory distress in first day of life were studied.
Results: The present study is descriptive in nature where clinical spectrum of respiratory distress in neonates and its outcome were studied. 1500 Neonates were admitted in NICU during the study period, among them 200(13.3%) Developed respiratory distress in first day of life. In the overall study 97.5% Survived with 5 deaths. 3 Deaths were due to preterm with RDS, 2 due to CDH. Most of the deaths were due to RDS.
Conclusions: MAS was the main cause of respiratory distress followed by RDS in first day of life. Immediate clinical outcome of new-born respiratory distress in term of mortality rate is variable.

Keywords: Meconium aspiration syndrome, Neonates, Respiratory distress

INTRODUCTION

Respiratory distress in neonates is one of the important clinical manifestations of a variety of disorders of the respiratory system and non-respiratory disorders.

Respiratory distress (RD) is a challenging problem and is one of the most common causes of admission in neonatal intensive care unit (NICU).[1]

Early diagnosis of newborn distress is very important for its management and good clinical outcome .This study has made an attempt in early identification of the causes of newborn distress by clinical assessment of its severity, risk factor association.

There has been a tremendous advance in the management of respiratory distress such as ventilator therapy with different modes such as CPAP, conventional mechanical ventilation; ultra high frequency jet ventilation, liquid ventilation, surfactant replacement therapy, sophisticated monitoring and extracorporeal membrane oxygenation all have improved the outcome among the babies with respiratory distress.

In spite of the varying recent advance in clinching diagnosis and management there have been very less clinical studies on the neonatal respiratory distress in our country. Therefore, there is a need to know the etiological factors and outcome of the babies with respiratory distress.

This study has been designed to know the etiology, clinical features, management and outcome of the babies with respiratory distress. The objective of this study was to present study was planned to find the commonest causes of RD in first day of life of a neonates brought to a referral NICU, and to evaluate clinical signs, and to find out immediate outcome of a neonate who were admitted in the NICU with RD.

METHODS

The study was carried out in the Department of Paediatrics, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh, India. Prospective study of 200 newborns with respiratory distress who were admitted in Nicu King George Hospital, Visakhapatnam, between July 2014 to July 2015.

Inclusion criteria

- All newborns admitted to NICU of King George Hospital,Visakhapatnam within 24 hours of birth due to respiratory distress
- Babies included were both term and preterm babies.

Exclusion criteria

- All Newborns admitted to NICU with onset of respiratory distress after 24 hours.

RESULTS

The present study is descriptive in nature where clinical spectrum of respiratory distress in neonates and its outcome were studied. 1500 neonates were admitted in NICU during the study period, among them 200 (13.3%) developed respiratory distress.

In the present study mortality was 2.5% (5 out of 200 cases). 3 cases with RDS and 2 cases with CDH.

Table 1: Etiology of respiratory distress.

Etiology	Frequency n = 200
Respiratory system	154
CNS	37
CVS	7
Diaphragmatic hernia	2

Table 2: Respiratory system causes of distress in newborn.

Diagnosis	No. of cases
MAS (meconium aspiration syndrome)	70
RDS (respiratory distress syndrome)	64
TTNB (transient tachypnea of newborn)	18
Congenital pneumonia	2
Total	**154**

Table 3: Final diagnosis versus duration of respiratory distress.

Final diagnosis	Total cases	Distress for <3 days	Distress for 4-7 days	Distress 8-10 days
MAS	70	49	20	1
RDS	64	13	50	1
Perinatal asphyxia	37	29	7	1
TTNB	18	18	0	0
CHD	7		7	0
Congenital pneumonia	2		1	1

Table 4: Duration of oxygen therapy versus severity of respiratory distress.

Final diagnosis	Frequency n = 200	Severe distress n = 118	No of days on oxygen		
			1-3 days	4-7 days	7-10 days
MAS	70	45	49	20	1
RDS	64	47	13	50	1
TTNB	18	3	18		
C. pneumonia	2	2		1	1
Perinatal asphyxia	37	16	29	7	1
CHD	7	3		7	
CDH	2	2	2		

Table 5: Treatment intervention.

Final diagnosis	Frequency n = 200	Surgical intervention	Mechanical ventilation	Surfactant therapy	CPAP
MAS	70	0	0	0	0
RDS	64	0	6	10	4
Perinatal asphyxia	37	0	0	0	0
TTNB	18	0	0	0	0
CHD	7	0	0	0	0
CDH	2	1	1		
C. pneumonia	2	0	0	0	0

Table 6: Mortality.

Final diagnosis	Frequency N = 200	Mortality
MAS	70	0
RDS	64	3
Perinatal asphyxia	37	0
TTNB	18	0
CHD	7	0
CDH	2	2
C. pneumonia	2	0

Table 7: Gestational age of the baby.

Gestational age	Frequency n = 200	Severe distress n = 118	%
Preterm	64	48	75%
Term	134	68	50.7%
Post term	2	2	100%

P value - 0.003 chi - square - 11.937 statistically significant.

Table 8: Sex ratio.

Sex	Frequency = 200	Severe distress n = 118	%
Male	128	70	54.6%
Female	72	48	66.6%

P value 0.098 statistically not significant.

DISCUSSION

In the present study out of 200 babies 134, (67%) were term babies, 64 (32%) were preterm and 2 babies (1%) were post term babies babies 75% of preterm newborns (47 out of 64) developed severe respiratory distress compared to 50.7% (68 out of 134) in term newborns. In a study by Santhosh et al observed severe distress was more common in preterm babies than term babies.[2] Dani C and Lureti M has also observed in their studies that preterm babies were more associated with respiratory distress when compared to term babies.[3]

Mode of delivery

In the current study among 200 babies 124 (62%) were delivered by normal vaginal delivery and 76 (38%) were delivered by caesarean section. 66.7% of newborns (82 out of 124) born by normal vaginal route developed severe respiratory distress compared to 47% of the newborns (36 out of 76) by caesarean section. A study conducted by Santhosh et al showed that majority of Preterm babies were delivered vaginally developed severe RDS.[2] In this study all the babies with TTNB were delivered by caesarean section. In a study done by Tudehope and Smith showed that TTNB was more common in babies born by caesarean section.[4]

Sex ratio

In the present study it was seen that out of 200 babies 128 were males and 72 were female babies. 66.6% of the newborn (48 out of 72) female babies developed severe respiratory distress as compared to 54.60% (70 out of 128) male babies. Lureti M shows the frequency of neonatal respiratory distress was higher in males than

compared with females.[5] Similarly Miller HC shows that the incidence of severe respiratory distress was almost three times higher among males than females.[6] The discrepancy in the present study was due to associated maternal risk factors.

Etiology and diagnosis

In the present study out of 200 cases identified with respiratory distress, 77% were respiratory in origin, 18% were CNS origin, 4% were of CVS causes, 1% were due to CDH.

The commonest cause among respiratory system origin was meconium aspiration syndrome (35%) followed by RDS (32%) and transient tachypnoea of newborn (9%). The only surgical cause for respiratory distress in the present study was CDH (1%).

In a study done by Alok Kumar it was seen that the RDS was found to be the commonest (42.7%) cause of respiratory distress followed by TTNB (17.0%), MAS (10.7%), Sepsis (9.3%) and birth asphyxia (3.3%).[7]

Similarly Nagendra K also shows that the commonest cause for respiratory distress in neonates was RDS (18.8%) followed by TTNB (14%) and MAS (12.5%).[8] This variability in the present study was due to increased number of term babies in the study and referral cases with meconium stained liquor.

Table 9: Comparison studies for etiology of respiratory distress.

Cause	MAS	TTNB	SEPSIS	RDS	Perinatal asphyxia
Current study	35%	9%	1%	32%	18%
Alok Kumar	10.7%	17%	9.3%	42.7%	3.3%
Nagendra K	12.5%	14%		18.8%	

Duration of oxygen therapy

In our study majority 95% required O2 more than 24 hours which implied O2 requirement depends on the severity of respiratory distress. Gabriel J studied the neonates born with respiratory distress requiring supplemental oxygen and it was seen that 80% required supplemental oxygen for at least an hour.[9]

Bhutta ZA studied 200 babies born out of which 81 were diagnosed with respiratory distress. It was seen that these babies required supplemental oxygen while in NICU.[10] But unlike the present study the above study has not analyzed O2 requirement depending on the cause of respiratory distress which would help to determine clinical outcome.

Table 10: Comparisons studies for oxygen therapy.

	Babies required oxygen
Current study	100%
Gabriel J	80%
Bhutta ZA	100%

Mortality

Mortality in the present study was 2.5% (5 out of 200). 3 cases died due to severe RDS and 2 cases due to CDH. Study conducted by Kamath BD et al showed that with the advent of CPAP and mechanical ventilation mortality in preterms as reduced to less than 5%.[11]

In a study done by Santhosh et al on 76 babies with respiratory distress 70 (92%) babies survived and 6 babies expired i.e mortality was 8%.[12] Mesas Burgos C et al in their study showed that children with prenatally diagnosed CDH represent a population with a more severe condition compared to infants diagnosed after birth. They have poorer outcomes with higher needs for ECMO or use of patch, and lower survival rates were observed.[12]

Mortality due to RDS

In the present study out of 5 cases expired 3 (60%) cases were due to RDS. In study done by Santhosh et al out of 6 deaths 4 (66.6%) deaths were due to preterms with hyaline membrane disease. In a study done by Malhotra observed that 88% mortality was due to respiratory distress syndrome.[13]

CONCLUSION

Meconium aspiration syndrome is the most common cause of respiratory distress in first day of newborn babys. Almost 60% of newborns with respiratory distress developed severe respiratory distress that required intensive monitoring. And depends on the cause of newborn distress. Immediate clinical outcome of newborn respiratory distress in term of mortality rate is variable.

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