INCIDENCE AND ETIOLOGY OF RESPIRATORY DISTRESS IN NEWBORN

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ABSTRACT

Screening of 1986 consecutive live births was done for evidence of Respiratory Distress by administering Downe's scoring in a prospective study at level II nursery of a medical college. A detailed antenatal, natal and postnatal history along with detailed examination supported by relevant investigations was carried out to arrive at the etiological diagnosis of Respiratory Distress Syndrome (RDS).

Results: 48 newborns developed RDS during the observation period. The incidence of RDS was 2.42%. Out of these 40.4% were <1500g, 16.6% above 2500 g and the rest between 1500-2500 g. Preterm were thirty times more prone to develop RDS than full term neonates. There was no significant difference in incidence of RDS in male and female neonates. The commonest cause of RDS was hyaline membrane disease (HMD) 18.8% followed by transient tachypnea of the newborn (TTNB) 14.5% and meconium aspiration syndrome (MAS) 12.5%. HMD was predominantly seen in the preterm in the gestational age of 29 to 32 weeks, TTNB was seen equally in term as well as preterm neonates, whereas MAS was common in the term than in the preterm neonates.

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KEY WORDS: Respiratory distress in newborn; Respiratory distress syndrome.

Introduction

Respiratory disorders are amongst the commonest causes of morbidity and mortality in the neonatal period. About 3% of all newborn have some sort of respiratory distress [1,2]. It is an initial manifestation of a large number of disorders like Idiopathic respiratory distress syndrome, meconium aspiration, bronchopneumonia, transient tachypnea of newborn, asphyxia neonatorum and non respiratory disorders like those of central nervous system origin, trauma, cardiac failure, metabolic disorders etc. On autopsy the incidence of respiratory disorders has been found to range from 32 to 54% [3,4]. However there are not many reports on the neonatal RDS. In developed countries the incidence of respiratory distress varies from 2 to 3.9% [1,3] whereas the Indian studies reported an incidence ranging from 0.69 to 8.3% [2,5,6]. The incidence of respiratory distress varies in relation to various predisposing factors like gender, gestational age and body weight. Indian studies have reported aspiration pneumonia and bronchopneumonia as leading causes of neonatal RDS and uniformly concluded that HMD is an uncommon cause of RDS as compared to the west. However M Singh et al believe that HMD is a common cause of neonatal RDS affecting approxi-

mately 15% of preterm and is being missed in several centers due to lack of awareness and poor monitoring facilities. In view of the above this study was conducted at a level II nursery of a medical college, where a cross section of Indian neonates are born, to see if there is any variation in the etiology and incidence of RDS.

Material and Methods

A screening of 1986 consecutive live births was done for evidence of respiratory distress and 48 neonates who developed respiratory distress lasting for more than 6 h were included in the study. Newborns were diagnosed to be having respiratory distress if they had two of the four criteria viz., respiratory rate more than sixty per minute, intercostal/subcostal recessions, expiratory grunt and cyanosis in room air [7]. A detailed antenatal and natal history was taken in all cases, specially for diabetes, eclampsia, pyrexia, prolonged labour, sedation during or at the time of delivery, leaking membranes of more than 24 hrs, foul smelling amniotic fluid, meconium staining and history of respiratory distress in the previous deliveries.

These infants were examined in detail with particular emphasis on gestational age, sex, weight, cyanosis, edema, rectal temperature, Downe's scoring of respiratory distress and examination of respiratory, cardiovascular and central nervous system. In order to establish etiology-haemoglobin, total and differential leucocyte count, band form counts, X-ray chest, gastric aspirate for Shake test and polymorphs was done. Lung biopsy was performed in those neonates who died of RDS and supportive investigations like blood culture, ECG, ABO grouping, CSF examination etc were performed as and when indicated. The diagnosis of clinical condi-

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tion causing respiratory distress was mainly based on careful history, detailed examination of the newborn and supported by relevant investigations.

Observations

A total of 48 neonates developed respiratory distress out of 1986 consecutive live births giving an incidence of 2.42%. Out of these 39.55% were in the weight group of <1500g and only 16.6% weighing >2500 g developed RDS (Table 1). Thirty-two of the total affected were preterms (66%) and 16 were born at term (34%). The incidence of RDS was thirty times more common in preterm than in the term babies (Table 2). Out of 48 neonates who developed respiratory distress, 25 were male and 23 were female. The male to female ratio was 25:23=1.08:1 (Table 3).

TABLE 1

Birth Weight (g)	Cases of Respiratory distress syndrome (RDS)	
	Number	Percentage
< 1000	10	20.8%
1001-1500	9	18.75%
1501-2000	14	29.16%
2001-2500	7	14.5%
> 2500	8	16.6%
Total	48	100%

TABLE 2

Gestational age	Total Live Births	Cases of RDS	
		Number	Percentage
< 37 wk	100	32	32%
> 37 wk	1886	16	0.84%
Total	1986	48	2.42%

TABLE 3

Birth Wt (g)	Cases of RDS		
		Male	Female
< 1000	10	4	6
1001-1500	9	6	3
1501-2000	14	8	6
2001-2500	7	4	3
> 2500	8	3	5
Total	48	25	23

The commonest cause of respiratory distress was hyaline membrane disease (18.8%), followed by transient tachypnea of newborn (14.5%) and meconium aspiration syndrome (12.5%). The incidence of other etiological factors in the causation of RDS is given in Table 4.

Discussion

In the present study 2.4% of the 1986 consecutively delivered neonates developed respiratory distress which is comparable to an incidence of 0.69%-8.3% reported by others [2,6,7]. A higher incidence in males was observed in the present study as well as in various

TABLE 4

Disease	Number	Incidence (%)
Hyaline membrane disease	9	18.8
Transient tachypnea of new bone	7	14.5
Meconium aspiration syndrome	6	12.5
Asphyxia	6	12.5
Apnoea	6	12.5
Septicaemia	4	8.3
Extreme prematurity	3	6.3
Congenital heart disease	2	4
Congenital pneumonia	2	4
Asp pneumonia	1	2
Laryngo tracheomalacia	1	2
Laryngeal stridor	1	2

earlier studies [5,7,8]. 32% of preterm developed RDS in our study where as only 21% and 3% of the pretermatures developed RDS in the study conducted by Mishra and Khatua respectively. The higher incidence of RDS in our study may be due to inclusion of relatively more pretermatures. The preterm were affected nearly thirty times more than the term babies, similar increase in incidence in preterm has been reported by Mishra and Khatua [2,5].

Etiologically hyaline membrane disease, transient tachypnea of newborn, meconium aspiration syndrome and asphyxia were common causes of RDS in our study. HMD was the commonest cause of respiratory distress and earlier workers have made similar observation [8,9]. Cunningham and Smith [10] in their study of 137 cases requiring transportation to specialised wards observed 78 cases of respiratory disorders of which 73% were due to HMD. Similarly Prodham et al [9] in their study of 1402 cases of respiratory distress with birth weight of 2 kg or less, found HMD in 42.4% of cases. The incidence of HMD was lower in our study compared to the western studies [8,9]. Other Indian workers [2,5,6] have made similar observations.

Thus prematurity, meconium aspiration and perinatal asphyxia were the major factors associated with high incidence of respiratory distress in neonates. Improved antenatal supervision, timely treatment of maternal diseases, improved obstetrical and neonatal management will go a long way in reducing the incidence of respiratory distress in newborn.

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