

ETIOLOGY AND RISK FACTORS FOR NEONATAL ADMISSION WITH RESPIRATORY DISTRESS: A TERTIARY CARE HOSPITAL-BASED STUDY

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ABSTRACT

Objective: Respiratory disorders are the most common cause of admission for neonatal intensive care unit whose incidence ranges from 4% in term babies and 20% in post-terms to 30% in pre-terms. The incidence increases with decreasing gestational age and birth weight. Severity of distress is assessed by scoring systems. There is no study conducted in this tertiary center; for this reason, we took this study to identify the etiology and risk factors for neonates admitted.

Methods: This was a hospital-based prospective study done at a tertiary care center in NICU of GB Pant hospital, Srinagar, for a period of 6 months between January 2020 and June 2020. A total of 320 babies were taken up for the study with 187 (58.4%) male and 133 (41.6%) female babies. Respiratory distress was defined as having any two signs of respiratory rate of >60 breaths/min, subcostal or intercostal retractions, nasal flaring, grunting, with or without cyanosis.

Results: A total of 320 babies were included in the study with 58.4% male babies and 41.6% female babies. 65% were born by cesarean section and 35% by vaginal delivery. 71.8% babies were born at term and 28.2% babies pre-term. 32.5% had birth weight of <2.5 kg and 67.5% had more than 2.5 kg. 95.62% had a respiratory cause of distress with 60.9% TTN, 27.8% RDS, 6.25% MAS, and 0.62% congenital pneumonia. Only 4.37% cases had a non-respiratory cause with 2.5% sepsis, 1.25% congenital heart disease, and 0.62% congenital diaphragmatic hernia as cause of respiratory distress.

Conclusion: 95.62% cases of distress had a respiratory cause with TTN and RDS accounting for a majority of the cases both of which can be easily averted by taking necessary preventive measures by assessing the antenatal risk factors or managed effectively by identifying the cases early on post-partum.

Keywords: Murmur, CHD, Echocardiogram, VSD, ASD, PDA.

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INTRODUCTION

Respiratory disorders are the most frequent cause of admission for neonatal intensive care in both term and pre-term newborns [1]. The incidence varies from 30% among pre-terms and 21% among post-terms to 4.2% among term babies [2]. As expected, the incidence of respiratory disorders increases with decreasing gestational age and birth weight [3].

The clinical diagnosis of respiratory distress in a newborn is suspected if there is tachypnea, i.e., respiratory rate is greater than 60 breaths/min in a quite resting baby, presence of grunting, and/or retractions [4]. Severity of respiratory distress can be assessed by many scoring systems of which Downe's is one with parameters of respiratory rate, cyanosis, retractions, grunting, and air entry in both lungs [5]. Common causes of respiratory distress are respiratory distress syndrome (RDS), transient tachypnea of newborn (TTN), pneumonia, aspiration syndromes, pneumothorax, pleural effusion, and pulmonary hemorrhages [6,7]. Other uncommon causes include tracheoesophageal fistula, cysts and tumors, congenital lobar emphysema, pulmonary hypoplasia, accessory or sequestered lobes, pulmonary lymphangiectasia, and pulmonary arteriovenous fistula. Non-respiratory causes of respiratory distress are central nervous system trauma, diaphragmatic paralysis, asphyxia, cardiac failure, and various metabolic disorders.

Aims and objectives

The aims and objectives are to study the etiology and risk factors for neonatal admission with respiratory distress in a tertiary care hospital.

METHODS

This was a hospital-based prospective study done at a tertiary care center in NICU of GB Pant hospital, Srinagar, for 6 months between January 2020 and June 2020. A proper consent was taken from the guardians or the parents of the patients participating in the study whose confidentiality was maintained. A total of 320 babies were taken up for the study with 187 (58.4%) male and 133 (41.6%) female babies. Respiratory distress was defined as having any two of the following:

- Tachypnea (RR of > 60 breaths/min)
- Chest retractions, nasal flaring
- Grunting
- With or without cyanosis.

Antenatal risk factors, mode of delivery, onset of respiratory distress, and its severity were documented. The severity of respiratory distress was assessed using Downe's score which uses the five parameters of respiratory rate, chest in drawing, grunting, air entry, and cyanosis [8]. The total score ranged from 0 to 10 with score of ≤3 classified as mild respiratory distress; 4-5 as moderate; ≥6 as severe [8,9]. Other clinical presentations such as jaundice, meconium-stained body, hypoxemia (SPO₂ <90%), poor abnormal cry were noted. Birth weights were recorded from the baby's birth or immunization cards and babies were classified as small for gestational age, appropriate for gestational age, large for gestational age using the method described by Battaglia and Lubchenco [10]. Babies whose birth weight were less than 2.5 kg classified as low birth weight, 2.5-3.9 kg as normal birth weight, ≥4.0 kg as macrosomia. Diagnosis of sepsis or meningitis was made when the baby had a bacterial growth on blood culture or on

Table 1: Different characteristic features of the subjects of our study

	n	%
Gender		
Male	187	58.4
Female	133	41.6
Birth weight		
<2.5 kg	104	32.5
>2.5 kg	216	67.5
Gestational age		
Pre-term	90	28.2
Term	230	71.8
Mode of delivery		
Normal vaginal	112	35
Cesarean section	208	65

Table 2: Etiology of respiratory distress

	n	%
Respiratory causes		
Transient tachypnea of newborn	195	60.9
Respiratory distress syndrome	90	27.8
Meconium aspiration syndrome	20	6.25
Congenital pneumonia	2	0.62
Non-respiratory cause		
Sepsis	8	2.5
Congenital heart disease	4	1.25
Congenital diaphragmatic hernia	2	0.62

the reports of cerebrospinal fluid results, respectively. This study was approved by the Ethics and Research Committee.

Inclusion and exclusion criteria

Any baby aged 30 days or less with respiratory distress irrespective of gestational age was included and any baby aged 30 days or more with no respiratory distress, who died, left, or discharged against medical advice, was excluded from the study. Data were tabulated and analyzed using SPSS version 20. Frequency and percentages were used for qualitative analysis.

OBSERVATION AND RESULTS

A total number of 320 babies were taken up for study. 58.4% babies were male and hence predominated and 41.6% were female, 65% were born by caesarian section and 35% were born by vaginal delivery. 71.8% babies were born term and 28.2% babies pre-term with 32.5% being low birth weight (<2.5 kg) and 67.5% had appropriate weight (more than or equal to 2.5 kg). Of 320 babies, 95.62%, i.e., 306 had a respiratory cause of distress with 60.9%, i.e., 195 transient tachypnea of newborn; 27.8%, i.e., 89 babies respiratory distress syndrome; 6.25%, i.e., 20 meconium aspiration syndrome; 0.62%, i.e., 2 congenital pneumonia; 4.37%, i.e., 14 had non-respiratory cause of their distress with 2.5%, i.e., 8 sepsis; 1.25%, i.e., 4 congenital heart disease; and 0.62%, i.e., 2 congenital diaphragmatic hernia as cause of their respiratory distress (Tables 1 and 2).

DISCUSSION

Respiratory distress is one among the most common problems faced by newborns at birth and in initial few hours to days. As per the American Academy of Pediatrics, around 10% of neonates need some resuscitation and 1% needing prolonged resuscitation at the time of birth with [11]. Every year around 2.9 million neonates die within the 1st month of life which accounts for about half of the deaths in under-fives in most regions and approximately 44% globally; and 90% cases are from low-to-middle income countries. These deaths are preventable if anticipated or identified early with necessary action taken. Proper antenatal history, any abnormal examination, or investigations should alert the team of health-care workers for any anticipatory and necessary action which can avert any unacceptable event.

The present study showed that respiratory distress was more common in males (58.4%) as compared to females (41.6%) as has been seen in multiple studies like the one conducted by Brahmaiah *et al.* [12] with respiratory distress in 59% of male babies. Similar results have been seen in multiple studies as those conducted by Baseer *et al.* [13], Liu *et al.* [14], and Niesłuchowska-Hoxha *et al.* [15].

One of the most important causes of respiratory distress in newborns is transient tachypnea of newborn which is common in cesarean delivery and precipitous birth. In many regions of the world including ours, there is a high cesarean rate and hence increase in TTN cases and hence admission. Our study showed that TTN was responsible for 60.9% of all cases of respiratory distress with similar results shown by many studies like one conducted by Raha *et al.* [16] with TTN being the most common (47.3%) cause of respiratory distress in newborns. LSCS (65%) was the common mode of delivery compared to the normal vaginal delivery (35%) in our study with results similar to a study conducted by Harshini *et al.* [17] in neonates in a tertiary care medical college hospital. 95.62% neonates in our study had a respiratory cause of their distress with 60.9% transient tachypnea of newborn and only 4.37% had non-respiratory cause of their distress with similar results in other studies like one conducted by Brahmaiah *et al.* [12] with 85% neonatal distress caused by respiratory causes.

CONCLUSION

Since 95.62% of the cases of distress had a respiratory cause with TTN and RDS accounting for 88.7% both of which can be easily averted by taking necessary preventive measures by assessing the antenatal risk factors or managed effectively in peripartum period. All deliveries should be conducted at or beyond 37 weeks of gestation which allows the maturation of lungs which can decrease the RDS admissions drastically. Besides this, cesarean section should not be made a routine, either in government or private sector which leads to increase in TTN cases. These two steps if taken can reduce the incidence of NICU admission definitely. Furthermore, any other risk factors such as large babies and small babies should be identified antenatal and early to minimize the overburdening of the neonatal ICU.

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CONFLICT OF INTEREST

None.

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