

A PROSPECTIVE OBSERVATIONAL STUDY ON SEVERITY, RISK FACTORS AND MANAGEMENT OF RESPIRATORY DISTRESS SYNDROME IN PRETERM NEONATES AT A TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

Respiratory distress syndrome (RDS) primarily affects preterm neonates due to pulmonary surfactant deficiency. This study aims to evaluate the severity, risk factors, and management strategies for RDS in preterm neonates. A prospective observational study was conducted over six months at a tertiary care hospital, involving 120 neonates. The findings indicate that 69.2% had mild RDS, with LSCS being the most common risk factor. Oxygen therapy and surfactant replacement significantly improved neonatal outcomes. Early diagnosis and appropriate management are crucial for reducing morbidity and mortality.

KEYWORDS: Respiratory Distress Syndrome, Preterm Neonates, APGAR Score, CPAP, Surfactant Therapy.

INTRODUCTION

Respiratory distress syndrome (RDS), formerly known as hyaline membrane disease, is a leading cause of respiratory failure in preterm neonates.^[1] It is primarily caused by a deficiency of pulmonary surfactant, a lipoprotein complex that reduces surface tension in the alveoli, preventing their collapse.^[2] Surfactant deficiency leads to impaired gas exchange, resulting in hypoxia, respiratory acidosis, and progressive respiratory failure.^[3]

Preterm neonates, particularly those born before 37 weeks of gestation, are at a significantly higher risk of developing RDS. The incidence of RDS is inversely related to gestational age, with neonates born before 28 weeks exhibiting the

highest risk. The major risk factors for RDS include prematurity, maternal diabetes, perinatal asphyxia, caesarean delivery without labour, and multiple births. The Silverman-Andersen score and the APGAR score are commonly used clinical tools to assess the severity of respiratory distress in neonates.^[4,5]

Over the past few decades, advances in neonatal care have significantly improved the survival rates of preterm infants with RDS. The administration of antenatal corticosteroids to pregnant women at risk of preterm delivery has been shown to enhance fetal lung maturation and reduce the severity of RDS.^[6] Additionally, exogenous surfactant therapy, continuous positive airway pressure (CPAP), and mechanical ventilation have revolutionized the management of RDS, leading to improved outcomes and reduced neonatal mortality.^[7]

Despite these advancements, RDS remains a significant concern in neonatal intensive care units (NICUs) worldwide. Early identification of at-risk neonates and prompt initiation of appropriate respiratory support are essential for optimizing clinical outcomes.^[8,9] This study aims to evaluate the severity, risk factors, and management strategies for RDS in preterm neonates, providing valuable insights into current treatment approaches and their effectiveness.

MATERIALS AND METHODS

A prospective observational study was conducted for six months at Andhra Pradesh Vaidhya Vidhana Parishad Hospital. A structured proforma was used to collect patient data, including demographic details, gestational age, birth weight, and treatment modalities. Statistical analysis was performed using standard methods.

RESULTS

Among 120 neonates, 80.83% were born between 33-36 weeks, and 61.7% were males. Low birth weight (<2500g) was observed in 63.3%. The severity distribution was as follows: 69.2% mild, 15% moderate, and 15.8% severe RDS. LSCS (48.3%) was the most common risk factor. Oxygen therapy, CPAP, and surfactant administration were the primary treatment modalities.

Table 1: Gestational age of child.

S. No.	Gestational Age	No. of Patients	Percentage
1.	< 28 Weeks	1	0.84%
2.	28 – 32 Weeks	22	18.33%
3.	33- 36 Weeks	97	80.83%
	TOTAL	120	100%

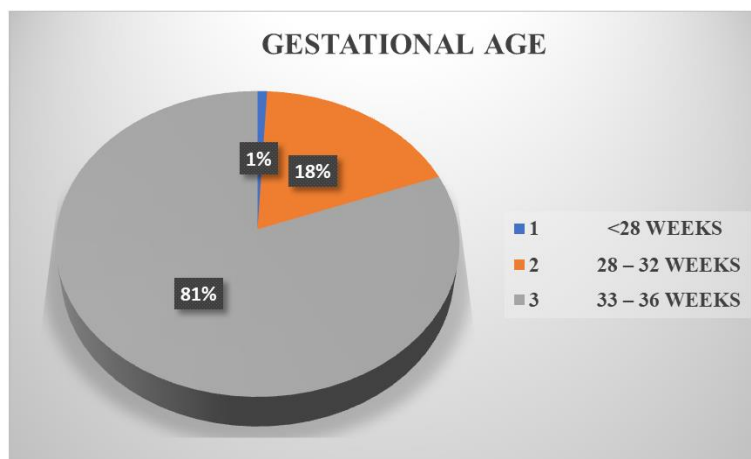
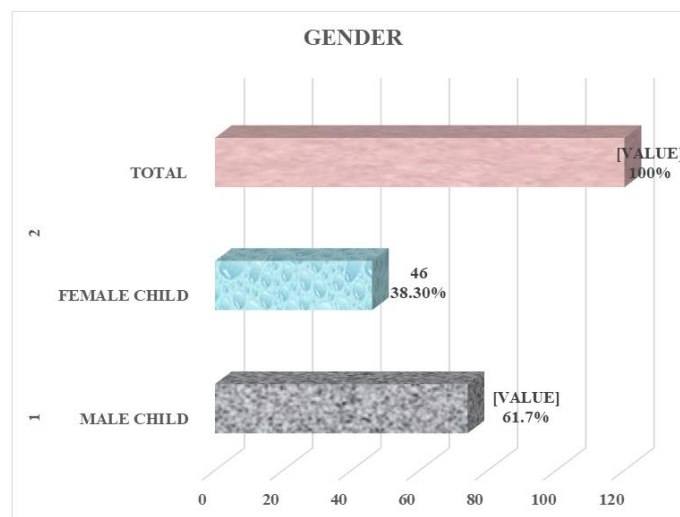


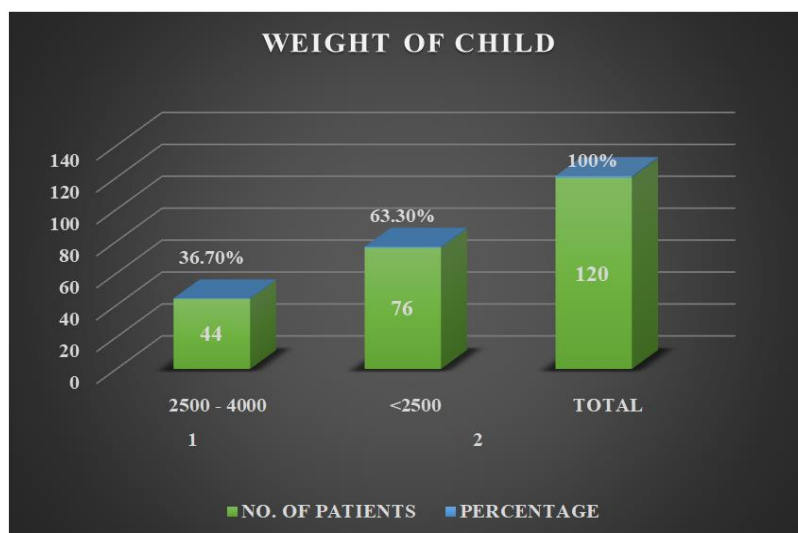
Fig No.1:-Gestational age of child.

Table 2: Gender Wise Distribution.

S. No	Gender	No. of Patients	Percentage
1.	Male Child	74	61.7%
2.	Female Child	46	38.30%
	Total	120	100%

**Fig No. 2: - Gender.****Table 3: Weight of Child.**

S. No	Weight of Child	No. of Patients	Percentage
1.	2500 – 4000g	44	36.7%
2.	<2500 g	76	63.3%
	Total	120	100%

**Fig No. 3: -Weight of child.****Table 4: Severity of RDS.**

S. No.	Severity	No. of Patients	Percentage
1.	Mild	83	69.2%
2.	Moderate	18	15%
3.	Severe	19	15.8%
	Total	120	100%

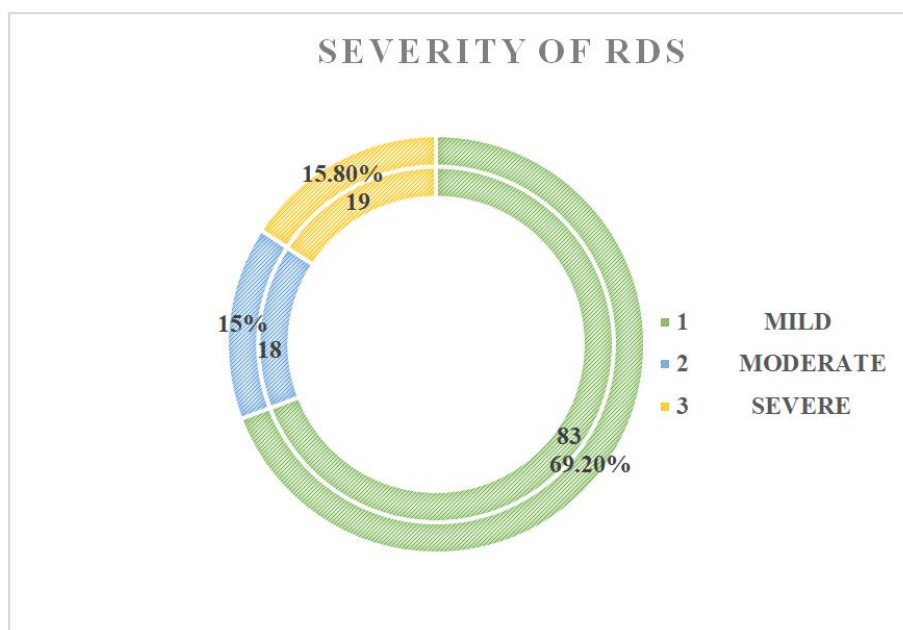


Fig No. 4: - Severity of RDS.

Table 5: APGAR Score At 1 Min.

S. No.	APGAR Score At 1 Min	No. of Patients	Percentage
1.	2 – 4	18	15%
2.	4 – 6	62	51.7%
3.	>6	40	33.3%
	Total	120	100%

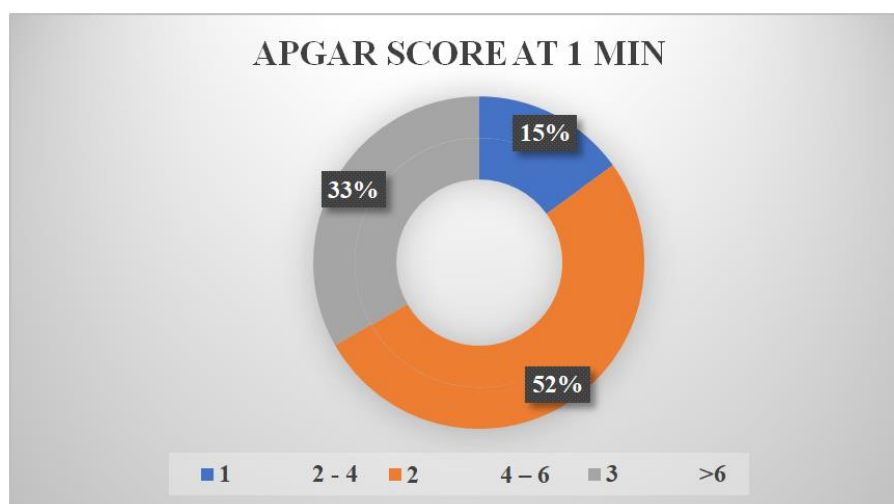


Fig No. 5: - APGAR score at 1 min.

Table 6: APGAR score at 5 min.

S. No.	APGAR score at 5 min	No. of Patients	Percentage
1.	2 – 4	8	6.6%
2.	4 – 6	10	8.4%
3.	>6	57	47.5%
4.	8 – 10	45	37.5%
	Total	120	100%

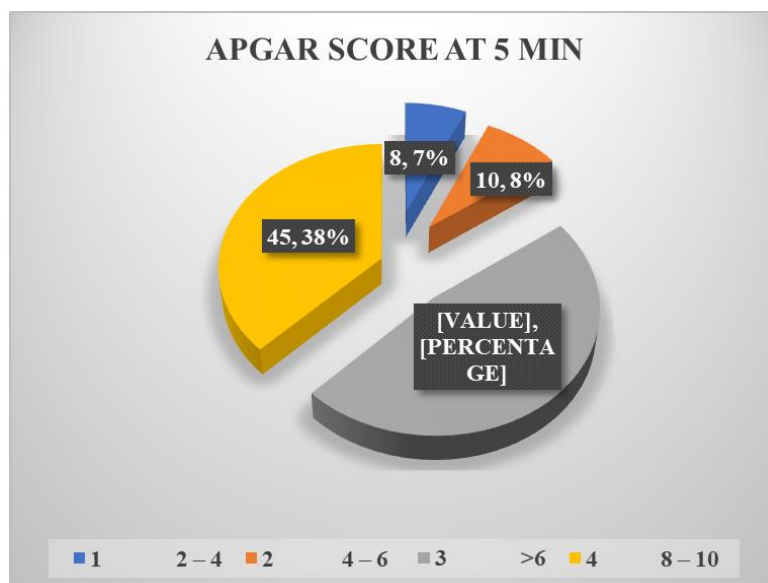


Fig No. 6: -APGAR score at 5 min.

Table 7: Risk Factors.

S. no	Risk factors	No. Of patients	Percentage
1.	LSCS	58	48.3%
2.	FETAL DISTRESS	11	9.2%
3.	PERINATAL ASPHYXIA	11	9.2%
4.	IUGR	10	8.3%
5.	MULTIPLE BRITH TWIN 1	3	2.5%
6.	MULTIPLE BRITH TWIN 2	9	7.6%
7.	GESTATONAL DIABETES	5	4.1%
8.	PPROM	4	3.4%
9.	PRE – ECLAMPSIA	5	4.1%
10.	OLIGOHYDRAMNIOS	2	1.7%
11.	CHORIOAMNIONITIS	1	0.8%
12.	APH	1	0.8%
	Total	120	100%

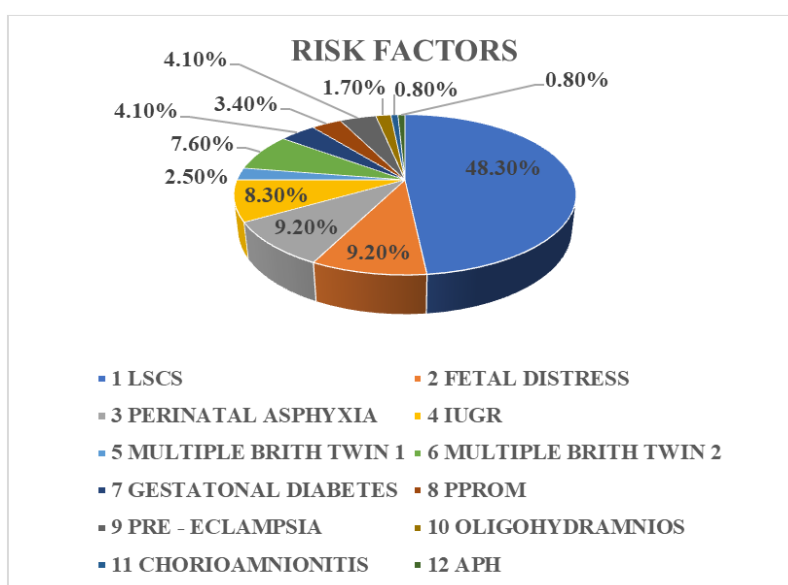
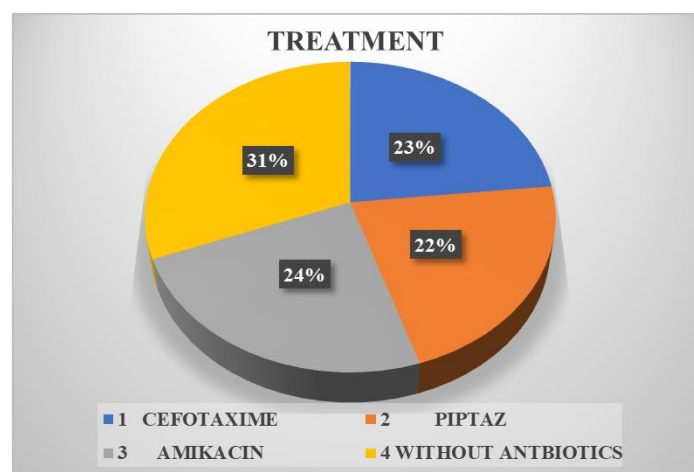


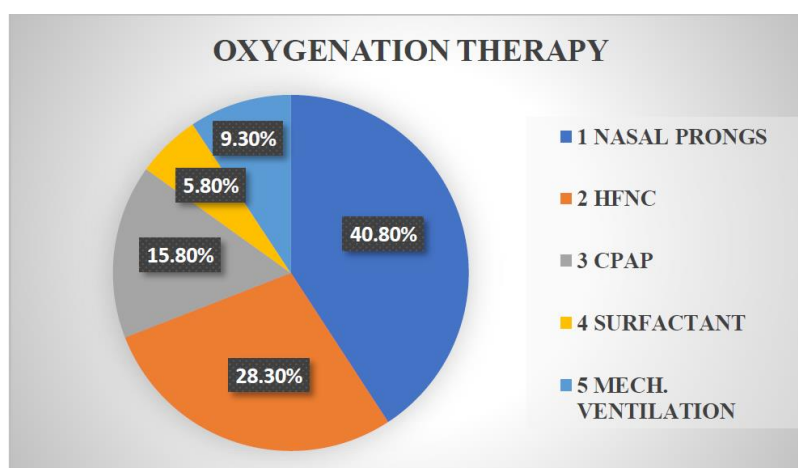
Fig No.7: -Risk factors of RDS.

Table 8: Treatment.

S. no	Antibiotics	No. of patients	Percentage
1.	CEFOTAXIME	28	23.3%
2.	PIPTAZ	26	21.6%
3.	AMIKACIN	29	24.3%
4.	WITHOUT ANTBIOTICS	37	30.8%
	TOTAL	120	100%

**Fig No. 8: -Treatment.****Table 9: Oxygenation therapy.**

S.no	Oxygenation therapy	No. of patients	Percentage
1.	NASAL PRONGS	49	40.8%
2.	HFNC	34	28.3%
3.	CPAP	19	15.8%
4.	SURFACTANT	7	5.8%
5.	MECH. VENTILATION	11	9.3%
	TOTAL	120	100%

**Fig No. 9: -Oxygenation therapy.**

DISCUSSION

The study findings indicate that preterm neonates remain at high risk for RDS, with gestational age and birth weight playing significant roles in disease severity. The predominance of LSCS as a risk factor is consistent with previous literature, suggesting that the lack of physiological labour may contribute to immature lung development in neonates.

Treatment approaches in this study were in line with current neonatal care protocols. The use of CPAP in 15.8% of cases and surfactant therapy in 5.8% aligns with international recommendations for non-invasive ventilation strategies to improve lung compliance. The survival rate of 90.4% reinforces the importance of early diagnosis and timely intervention.

When comparing our results with previous studies, neonates who received antenatal corticosteroids had better respiratory outcomes, which aligns with global guidelines advocating for their use in high-risk pregnancies. However, despite significant improvements in RDS management, challenges such as the risk of bronchopulmonary dysplasia and prolonged ventilation remain. Further research should focus on optimizing ventilation strategies and minimizing complications in severe RDS cases.

CONCLUSION

RDS remains a major health concern in preterm neonates. The study highlights that gestational age, birth weight, and delivery mode significantly impact disease severity. Effective management through oxygen therapy, CPAP, and surfactant administration significantly improves survival rates. Future research should focus on optimizing treatment protocols and reducing long-term complications.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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