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Original Research Article.

A Prospective Evaluation of the Epidemiology, Underlying Causes, and Clinical Presentation of Neonatal Respiratory Distress in a level 6 NICU In Eastern India

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ABSTRACT

Background: Respiratory distress (RD) is one of the most common clinical problems in neonates and remains a major cause of morbidity and mortality worldwide. In India, where the neonatal mortality rate continues to be high, RD contributes substantially to early neonatal deaths. The clinical spectrum of RD is diverse, ranging from transient self-limiting disorders to life-threatening conditions requiring intensive care. Prematurity, low birth weight, and maternal complications such as PROM, diabetes, and hypertensive disorders further predispose neonates to RD. Understanding the epidemiology, etiology, and clinical profile of RD in regional NICU settings is critical to guide evidence-based management and improve outcomes.

Aim: To evaluate the epidemiology, underlying causes, and clinical presentation of neonatal respiratory distress in a level 6 NICU in eastern India.

Materials and Methods: This prospective, hospital-based cohort study was conducted in the NICU of Hi-Tech Medical College & Hospital, Eastern India, from November 2015 to October 2017. A total of 202 neonates aged ≤28 days with GA 28–41 weeks presenting with RD were enrolled. RD was defined by the presence of ≥2 features on at least two examinations 1 hour apart: tachypnea, retractions, grunting, cyanosis, apnea, or gasping. Neonates with major congenital anomalies, GA <28 weeks, and birth weight <1000 g were excluded. Detailed demographic, maternal, intrapartum, and neonatal data were recorded. Investigations included ABGs, pulse oximetry, sepsis screen, chest X-rays, and cultures. Etiology was assigned based on integrated clinical, radiographic, and laboratory findings. Data were analyzed using descriptive statistics and chi-square tests, with $p<0.05$ considered significant.

Results: Most mothers were aged 20–28 years (85.6%), and caesarean delivery predominated (75.2%). Nearly 55% of neonates were LBW or VLBW, and 50% were preterm. RD onset was early, with 79.7% presenting within 6 hours of life. The most common clinical features were tachypnea (95.5%) and nasal flaring (99%). Radiological evaluation revealed RDS in 39.6% and hyperinflation in 30.2%. Etiologically, RDS (39.6%) and TTN (30.2%) were most common, followed by sepsis (25.2%) and MAS (15.3%). All neonates required oxygen therapy, with 25.2% needing mechanical ventilation and 20.3% receiving surfactant. Survival was 95%, with mortality of 5%, mainly due to RDS in preterm LBW/VLBW infants and birth asphyxia in term neonates.

Conclusion: Respiratory distress in neonates is strongly linked to prematurity, LBW, and maternal complications. RDS, TTN, and sepsis are the leading etiologies. Early recognition, standardized investigations, and timely escalation of respiratory support significantly improve survival. Antenatal steroid use and institutional delivery remain pivotal in prevention and favorable outcomes.

Keywords: Neonatal respiratory distress, Prematurity, Low birth weight, Etiology, Clinical profile.

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INTRODUCTION

The neonatal period—the first 28 days of life—carries the greatest mortality risk of any time in childhood and thus represents the critical frontier for child survival strategies.[1] Across low- and middle-income countries, and notably in India, declines in neonatal mortality have lagged behind improvements in post-neonatal and under-five mortality, reflecting a historical underinvestment in newborn health services and specialized perinatal care.[1]

The consequence is stark: India continues to shoulder one of the world's largest absolute numbers of neonatal deaths each year, with a national neonatal mortality rate (NMR) that has declined more slowly than needed to meet historic global targets.[1,2] With the "Committing to Child Survival: A Promise Renewed" agenda framing a pathway to under-five mortality ≤20 per 1,000 by 2035, the fulcrum for future progress lies unequivocally in the first days of life.[1]

Timing analyses consistently show that neonatal deaths cluster very early. Roughly three-quarters occur in the first week, and more than one-third on day 0, highlighting the razor-thin window in which recognition, triage, and initiation of effective therapies must occur.[3] The causes driving this burden are well-characterized at population level: preterm birth complications and infections dominate neonatal mortality in India, mirroring the global pattern and accounting for a large share of early deaths.[4,5] Perinatal asphyxia and congenital malformations contribute additional load and often interact with prematurity to worsen outcomes.[5] These epidemiologic contours are not simply abstract numbers; they define the operational priorities for facilities receiving high-risk deliveries and referrals.

Compounding these risks is India's exceptionally high prevalence of low birth weight (LBW) and small-for-gestational-age (SGA) births.[6] Nearly a third of Indian neonates are LBW, representing an outsized fraction of the global LBW burden; almost half are SGA in some estimates.[6]

Mechanistically, SGA and prematurity amplify the vulnerability of the lung and immune system, increasing susceptibility to respiratory failure, sepsis, hypoglycemia, and temperature instability. In practice, these infants drive a disproportionate share of neonatal intensive care unit (NICU) admissions and resource utilization.[1,4,6]

Within this context, respiratory distress (RD) is pivotal. It is one of the most common reasons for immediate NICU admission in both term and preterm neonates, and it is a major proximate pathway linking upstream risks (prematurity, intrauterine growth restriction, perinatal infection) to death or serious morbidity. The clinical case definition—tachypnea, retractions, nasal flaring, expiratory grunting, cyanosis—captures a heterogeneous spectrum that includes respiratory distress syndrome (RDS) from surfactant deficiency, transient tachypnea of the newborn (TTN), meconium aspiration syndrome (MAS), pneumonia/sepsis-related respiratory failure, pulmonary hypertension, and cardiorespiratory disorders. The shared phenotype of increased work of breathing belies diverse pathophysiology, necessitating structured evaluation to guide timely, tiered respiratory support. Aligning early recognition with standardized bundles (thermal care, glucose monitoring, oxygen targeting, continuous positive airway pressure [CPAP] where appropriate, and empiric antibiotics when sepsis is suspected) is central to outcome improvement.[1,4,5]

Yet, national and global aggregates cannot substitute for local data. Facility-level case mix, obstetric practices (e.g., elective caesarean rates), antenatal steroid coverage, referral pathways, and the availability of CPAP/surfactant and skilled nursing vary widely across regions. These differences shape the distribution of etiologies (for example, a higher share of TTN in centers with more late-preterm/early-term caesareans, or higher RDS where extreme prematurity is frequent) and influence survival, oxygen duration, and escalation needs.[1,4,6] A prospective, unit-level profile of RD therefore fills a crucial evidence gap: it helps calibrate triage algorithms, anticipates oxygen and device requirements, identifies deficits in antenatal.

In sum, by anchoring epidemiology, aetiology, and clinical profiles to the realities of a tertiary NICU serving Eastern India, this study aims to translate population-level priorities into unit-level decisions where minutes count and survival gains are most tractable.

MATERIALS AND METHODS

Present study was conducted to evaluate the epidemiology, underlying causes, and clinical presentation of neonatal respiratory distress in a level 6 NICU in eastern India in the Department of Paediatrics, Hi-Tech Medical College & Hospital, Eastern India, from November 2015 through October 2017, following approval from the Institutional Ethics Committee. Written informed consent was obtained from parents or guardians.

Methodology

We enrolled consecutive neonates (inborn and outborn) aged ≤28 days with gestational age (GA) 28–41 weeks who presented with respiratory distress (RD), defined by ≥2 features on two examinations ≥1 hour apart: tachypnea, subcostal/intercostal/suprasternal retractions, apnea, grunting, cyanosis in room air, or gasping. Exclusions: postoperative RD; syndromic neonates; major congenital anomalies including congenital heart disease and congenital diaphragmatic hernia; GA <28 weeks; birth weight <1000 g; and refusal to participate. The analytic dataset comprised 202 neonates.

All eligible admissions during the study window were screened daily by the research team. Each enrolled infant was reviewed at least three times during the first 24 hours and thereafter as clinically indicated. A pretested, closed-ended case record form captured uniform data across participants.

Epidemiologic descriptors included age at onset (by day of life), sex, residence, socio-economic status, date of admission, and length of stay. Perinatal descriptors captured GA (Ballard/obstetric dating) categorized as term (37–41 weeks), late preterm (34–36 weeks), early preterm (<34 weeks), and post-term (≥42 weeks); size for GA as SGA (<10th percentile), AGA, and LGA (>90th percentile); and birth-weight bands: NBW (>2.5 kg), LBW (≤2.5 kg), and VLBW (≤1.5 kg).

Maternal/obstetric history included age, education, parity, singleton/multiple gestation, antenatal care attendance, rash with fever, medical comorbidities (diabetes, gestational hypertension/preeclampsia/eclampsia, thyroid and seizure disorders), medications/exposures, premature rupture of membranes, liquor characteristics (meconium-stained/foul-smelling), antenatal steroids, and prenatal assessments.

Intrapartum/delivery data comprised place/mode of delivery (vaginal/caesarean), assisted delivery (forceps/vacuum), resuscitation steps, and Apgar scores at 1 and 5 minutes. Family history of consanguinity, early childhood deaths, lung disorders, or congenital heart disease was recorded.

Clinical Evaluation and Classification Of Aetiology

RD severity was graded using Silverman-Anderson and Downes scores. Systems review (respiratory, cardiovascular, neurologic, gastrointestinal) helped exclude non-pulmonary causes. Etiologic labels (e.g., transient tachypnea of the newborn, respiratory distress syndrome, meconium aspiration, pneumonia/sepsis-related RD, pulmonary hemorrhage, persistent pulmonary

hypertension, etc.) were assigned by triangulating history, examination, laboratory values (including arterial blood gases [ABG] when indicated), and radiography.

Monitoring and Investigations

Continuous pulse oximetry guided oxygen titration. ABG analyses were obtained in infants with RD >6 hours, clinical instability, or following changes in CPAP/ventilator settings. Sepsis evaluation (CBC, cultures including endotracheal aspirate/blood as appropriate) was triggered per clinical judgment. Serial chest radiographs were categorized as normal/abnormal and used to support etiologic assignment.

Management Overview (For Contextual Profiling)

Supportive care was instituted per unit protocols: oxygen therapy, CPAP, mechanical ventilation, and exogenous surfactant as required. Ventilator parameters were adjusted to achieve acceptable gases using the lowest feasible FiO_2. Dexamethasone (0.2–0.4 mg/kg) was administered approximately 24 hours before planned extubation at the discretion of the treating team. Chest physiotherapy was provided during and after ventilation. These data informed the clinical-profile description but were not primary analytic exposures for this article.

Primary outcomes for this paper were the distribution of epidemiologic characteristics, etiologies, and clinical severity profiles at presentation. Secondary descriptors included duration to RD resolution, NICU length of stay, and status at discharge (improved/discharged vs death). Infants were followed continuously in NICU/paediatric ward until discharge or death; the clinical endpoint was a hemodynamically stable infant tolerating feeds and gaining weight.

Statistical Analysis

We summarized epidemiologic and clinical variables using frequencies and percentages. Equality of proportions was assessed using exact/binomial tests for dichotomous variables and chi-square tests for variables with ≥3 categories. Cross-tabulation explored distributions by GA, size-for-GA, and birth-weight strata, and the association between etiologic categories and selected clinical features. Statistical significance was set at $p<0.05$.

RESULTS

The demographic analysis shows that the majority of mothers (85.6%) were between 20–28 years, with only 14.4% aged 29 years or above, and the mean maternal age was 24.38 years. This indicates that respiratory distress was more common among newborns of younger mothers. Gender distribution revealed a near balance with 53% males and 47% females, showing no statistically significant difference (p=0.439). Socio-economic status showed a predominance of upper-middle class families (49.5%), followed by equal distribution in upper-lower and lower-middle groups (25.2% each), which was highly significant (p=0.00001). Risk factor assessment revealed that primiparous mothers contributed to nearly three-fourths of cases (74.8%), a highly significant finding (p=0.000). Mode of delivery showed a striking predominance of caesarean sections (75.2%) over vaginal deliveries (24.8%), again statistically significant (p=0.000). All deliveries occurred in hospitals, highlighting a complete institutional delivery trend. (Table 1)

This table highlights the strong link between prematurity, low birth weight, and respiratory distress. Among preterm infants, 50.5% were very low birth weight (VLBW) and 39.6% were low birth weight (LBW). Interestingly, no preterm neonates were of normal birth weight. For term neonates, 22.2% were LBW, while the rest fell into the normal category. Post-term infants were absent in the RD cohort. Overall, VLBW accounted for 35.1% and LBW for 19.8% of cases. The highly significant chi-square (χ^2=111.382; p=0.000) confirms that prematurity and reduced birth weight are major determinants of neonatal respiratory distress. (Table 2)

The onset pattern shows that almost four-fifths (79.7%) of neonates developed respiratory distress within the first six hours of life, strongly significant (p=0.000). Another 9.9% presented within 6–24 hours, while smaller fractions developed symptoms between 24–72 hours (5%) and after 72 hours (5.4%). Regarding clinical features, tachypnea (95.5%) and nasal flaring (99%) were the most universal signs, indicating their importance as early diagnostic clues. Chest in-drawing (86.1%) was also common, while moderate proportions presented with grunting (64.9%), cyanosis (70.3%), and reduced bilateral air entry (69.8%). These findings emphasize the value of bedside clinical examination in early recognition. (Table 3)

Radiological investigations revealed that 39.6% of cases had hyaline membrane disease (HMD/RDS) in varying grades, aligning with the clinical dominance of RDS in the cohort. Hyperinflated lungs were the next common finding, present in 30.2% of neonates, suggesting conditions like TTN or air-trapping pathology. Infiltration (5%) and pneumothorax (5%) were less frequent but clinically significant since they represent complications or alternative etiologies of respiratory distress. Interestingly, 20.3% of neonates had normal radiographs despite clinical distress, reflecting the limitation of X-ray in diagnosing purely functional disorders like TTN. (Table 4)

Pulse oximetry revealed abnormalities in all neonates, underlining its sensitivity as a universal screening tool. ABG analysis was abnormal in 55.4%, indicating the presence of hypoxemia, hypercarbia, or metabolic derangements. Sepsis evaluation was positive in 25.2% of cases, with blood cultures confirming bacterial growth in 15.3%, signifying sepsis as a major contributor to RD. Electrolyte abnormalities were seen in 24.8%, while hypoglycemia affected 15.3% of neonates, mostly in preterm and LBW categories. Cardiac and neurological complications were identified in 5% each via ECHO and transcranial ultrasound, pointing toward congenital or acquired comorbidities. Lumbar puncture abnormalities were noted in 9.9%, supporting CNS infections as occasional contributors. This comprehensive diagnostic approach validated the multifactorial etiology of neonatal respiratory distress. (Table 5)

The etiologic analysis revealed respiratory distress syndrome (RDS/HMD) as the leading cause (39.6%), followed by transient tachypnea of newborn (TTN, 30.2%) and neonatal sepsis (25.2%). Meconium aspiration syndrome (MAS) was seen in 15.3%, while birth asphyxia contributed to 10.4% of cases. Apnea of prematurity (AOP) was identified in 24.8%, emphasizing the burden of immaturity. Less common but significant causes included congenital heart disease (5%), persistent pulmonary hypertension of newborn (PPHN, 5%), pneumonia (5%), pneumothorax (5%), and chronic lung disease (9.9%). This spectrum highlights RDS, TTN, and sepsis as the predominant contributors, with MAS and prematurity-related conditions adding substantially to morbidity and mortality. (Table 6)

Table 1: Demographics and risk factors for neonatal respiratory distress (N=202)

Section	Variable	Category	No.	%	p value / Binomial p
Demographic profile	**Age of mothers**	20–28	173	85.6	0.000
		≥29	29	14.4	
		Total	**202**	**100**	
	Mean age of mothers ± SD	—	**24.38 ± 3.801 years**		
	Sex of newborns	Male	107	53.0	0.439
		Female	95	47.0	
		Total	**202**	**100**	
	Socio-economic status*	Upper Lower	51	25.2	0.00001
		Upper Middle	100	49.5	
		Lower Middle	51	25.2	
		Total	**202**	**100**	
Risk factors	**Parity (N=202)**	Primipara	151	74.8	0.000
		Multipara	51	25.2	
		Total	**202**	**100**	
	Mode of delivery (N=202)	Vaginal	50	24.8	0.000
		C-section	152	75.2	
		Total	**202**	**100**	
	Place of delivery (N=202)	Hospital	202	100	
		Home	0	0	
		Total	**202**	**100**	

Table 2: Distribution of cases by gestational age and birth weight (χ^2=111.382; p=0.000)

Birth Weight / Term	Very low birth weight	Low birth weight	Normal birth weight	Total
	No.	%	No.	%
Preterm	51	50.5	40	39.6
Term	0	0.0	20	22.2
Post-term	0	0.0	0	0.0
Total	51	35.1	60	19.8

Table 3: Onset and Signs/Symptoms of Respiratory Distress (N=202)

Section	Variable	No.	%	Binomial p
Onset of RD	**<6 hours**	161	79.7	0.000
	6–24 hours	20	9.9	
	24–72 hours	10	5.0	
	>72 hours	11	5.4	
	Total	**202**	**100**	
Signs/Symptoms of RD	**Tachypnea**	193	95.5	
	Flaring of alanasi	200	99.0	
	Chest in-drawing	174	86.1	
	Grunting	131	64.9	
	Cyanosis	142	70.3	
	Reduced bilateral air entry	141	69.8	

Table 4: Chest X-ray findings among RD cases (N=202)

Finding	No.	%
HMD with varying grades	80	39.6
Hyperinflated lungs	61	30.2
Infiltration	10	5.0
Pneumothorax	10	5.0
Normal	41	20.3

Table 5: Invasive and Non-Invasive Investigations among Neonates with Respiratory Distress (N=202)

Investigation	Category	No.	%
Pulse-oximetry	Normal	0	0
	Abnormal	202	100
Sepsis screen	Positive	51	25.2
	Negative	151	74.8
Blood culture & sensitivity	Positive	31	15.3
	Negative	171	84.7
Arterial Blood Gas (ABG)	Normal	90	44.6
	Abnormal	112	55.4
Serum electrolytes	Normal	152	75.2
	Abnormal	50	24.8
Blood glucose	Normal	171	84.7
	Abnormal	31	15.3
ECHO	Normal	192	95.0
	Abnormal	10	5.0
Transcranial USG	Normal	192	95.0
	Abnormal	10	5.0
Lumbar puncture	Normal	182	90.1
	Abnormal	20	9.9

Table 6: Distribution of cases by aetiology of RD (N=202)

Aetiology	No.	%
TTN	61	30.2
HMD (RDS)	80	39.6
Sepsis	51	25.2
Birth asphyxia	21	10.4
MAS	31	15.3
CCHD	10	5.0
Pneumothorax	10	5.0
Pneumonia	10	5.0
CLD	20	9.9
AOP	50	24.8
PPHN	10	5.0

DISCUSSION

Our prospective cohort included 202 neonates with respiratory distress (RD), larger than cohorts by Sayid M. Barkiya et al. (2015)[7] (n=102), Keerti Swarnkar et al. (2015)[8] (n=140), and Rajavarapu Chandrasekhar et al. (2016)[9] (n=100), though smaller than Patil Rabindra B et al. (2014)[10] (n=1041). This sample sits within the mid-to-upper range of Indian NICU RD literature, strengthening precision for descriptive estimates.

Mothers were predominantly 20–28 years (85.6%), with ≥29 years (14.4%). Our sex distribution was male 53% / female 47%. Compared with other reports—male 69% in Rajavarapu Chandrasekhar et al. (2016)[9], 58% in Patil Rabindra B et al. (2014)[10], 67% in Keerti Swarnkar et al. (2015)[8], and 65% in Sayid M. Barkiya et al. (2015)[7]—our cohort shows a more balanced sex ratio than the male preponderance commonly described. In our data, primiparity accounted for 74.8%, and C-section for 75.2%. High C-section proportions were also reported by Rajavarapu Chandrasekhar et al. (2016)[9] (75%) and Keerti Swarnkar et al. (2015)[8] (73%), whereas Sayid M. Barkiya et al. (2015)[7] observed fewer C-sections (40%) with more NVD (60%). Thus, our parity and mode-of-delivery pattern aligns with studies where operative delivery predominates and contrasts with centers reporting higher NVD rates.

VLBW+LBW constituted ~55% of our RD admissions (VLBW 35.1%; LBW 19.8%); preterm infants were 50%. Comparable LBW/VLBW burdens were described by Rajavarapu Chandrasekhar et al. (2016)[9] (~60%) and Patil Rabindra B et al. (2014)[10] (~50%). Preterm proportions resembled Sayid M. Barkiya et al. (2015)[7] (preterm 43%) and Santosh S et al. (2013)[11] (preterm 61%), while Patil Rabindra B et al. (2014)[10] noted a higher term share (65.8%). The consistent message across studies is that prematurity and low birth weight dominate RD epidemiology. RD began <6 h in 79.7% of our neonates, close to 70% reported by Sayid M. Barkiya et al. (2015)[7]. Clinically, we observed tachypnea 95.5%, flaring of alar nasi 99%, chest in-drawing 86.1%, grunting 64.9%, and cyanosis 70.3%. This mirrors the near-universal tachypnea and nasal flaring in Arit Parkash et al. (year not specified)[12] (100%/100%), and corresponds to the high-specificity pattern of grunting + alar flaring emphasized by Keerti Swarnkar et al. (2015)[8] (tachypnea 67.4%, flaring 93.6%, chest retractions 76.1%, grunting 78.1%, cyanosis 76.9%). Our CXR distribution—HMD/RDS 39.6%, hyperinflation 30.2%, infiltration 5%, pneumothorax 5%, normal 20.3%—is directionally similar to Santosh S et al. (2013)[11] (HMD 25%, hyperinflation 29%, pneumothorax 2.6%, infiltration 18.4%, normal 25%), with a higher HMD burden consistent with our etiologic profile.

Pulse oximetry was abnormal in all cases; ABG abnormal 55.4%; sepsis screen positive 25.2%; blood culture positive 15.3%; ECHO abnormal 5%; abnormal TCU/S cranial USG 5%. Although direct comparators are scarce in the cited Indian RD series, the pattern supports routine use of basic monitoring + targeted labs to refine diagnosis and guide escalation.

We identified RDS 39.6%, TTN 30.2%, sepsis 25.2%, MAS 15.3%, birth asphyxia 10.4%, AOP 24.8%, CCHD 5%, PPHN 5%, pneumothorax 5%, BPD 9.9%. Other series report lower RDS shares: Patil Rabindra B et al. (2014)[10] 37.3%, Santosh S et al.[11] 31.5%, Sayid M. Barkiya et al. (2015)[7] 24%; some show higher TTN (e.g., Rajavarapu Chandrasekhar et al. (2016)[9] TTN 60% / RDS 6%; Keerti Swarnkar et al. (2015)[8] TTN 40.7% / RDS 17%). Our higher RDS likely reflects the 50% preterm composition and 55% LBW/VLBW burden—risk strata consistently linked to RD-related mortality worldwide, where preterm complications and infections are leading neonatal killers (43.7% and 20.8% of neonatal deaths in India)[13,14], and >80% of deaths occur among LBW/preterm neonates.[15,16] Our pneumothorax 5% falls within expected perinatal ranges described in standard references.[17] For birth asphyxia (10.4%), community incidence and case fatality vary widely (≈2–16.2% incidence; high CFR)[18,19], consistent with its contribution to morbidity in our series.

The pattern across multiple Indian NICUs converges on prematurity/LBW, early onset (<6 h), and classic RD signs as the dominant triad. Early recognition, CXR plus basic labs, and tiered respiratory support are central to reducing progression and mortality.

CONCLUSION

In this prospective NICU cohort from Eastern India, neonatal respiratory distress presented predominantly within 6 hours of life and was characterized by classic clinical signs, with chest radiography most frequently showing RDS/HMD. RDS (39.6%) and TTN (30.2%) were the leading etiologies, paralleling a high burden of prematurity and LBW/VLBW. Routine pulse oximetry, targeted ABGs, and standardized radiographic assessment supported timely diagnosis and stratification. Early recognition and protocolized escalation of respiratory support remain pivotal to reducing progression and optimizing outcomes.

REFERENCES

1. Sankar MJ, Neogi SB, Sharma J, et al. State of newborn health in India. J Perinatol. 2016;36(Suppl 3):S3–S8. doi:10.1038/jp.2016.183.

2. Registrar General of India. Sample Registration System (SRS) Statistical Report 2013. New Delhi; 2013.

3. Baqui AH, Darmstadt GL, Williams EK, et al. Rates, timing and causes of neonatal deaths in rural India: implications for neonatal health programmes. Bull World Health Organ. 2006;84:706–713.

4. Lawn JE, Blencowe H, Oza S, et al. Every Newborn: progress, priorities, and potential beyond survival. Lancet. 2014;384(9938):189–205.

5. Blencowe H, Cousens S, Oestergaard MZ, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990. Lancet. 2012;379(9832):2162–2172.

6. Lee ACC, Katz J, Blencowe H, et al. National and regional estimates of term and preterm babies born small for gestational age in 138 low- and middle-income countries in 2010. Lancet Glob Health. 2013;1:e26–e36.

7. Sayid M Barkiya et al. Clinico-Etiological Profile and Outcome of Neonatal Respiratory Distress. DOI: 10.17354/ijss/2016/82.

8. Keerti Swarnkar, Manish Swarnkar. Neonatal respiratory distress in early neonatal period and its outcome. International Journal of Biomedical and Advance Research 2015; 6(09): 643–64.

9. Chandrasekhar R et al. Clinical study of respiratory distress in newborn. Int J Contemp Pediatr. 2016 Aug;3(3):910–915. DOI: 10.18203/2349-3291.ijcp20162364

10. Patil Ravindra B. Clinical Profile and Outcome of Babies Admitted to NICU, Mc Gann Teaching Hospital Shivamogga, Karnataka: A Longitudinal Study. Sch. J. App. Med. Sci. 2014; 2(6G):3357–3360. ISSN 2320-6691.

11. Santosh S et al. A clinical study of respiratory disease in new born and its outcome. Indian Journal of Neonatal Medicine and Research 2013 Apr; 1(1):2–4. DOI: IJMR/2013/5918,1981.

12. Arit Parkash. Frequency, causes and outcome of neonates with respiratory distress admitted to NICU, NICH Karachi. JPMA 2015;65:771.

13. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE et al. Global, regional, and national causes of child mortality in 2000–13… Lancet 2015; 385(9966):430–440.

14. Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, Shet A et al. Causes of neonatal and child mortality in India… Lancet 2010; 376:1853–1860.

15. Chaudhari S, Bhalerao MR, Chitale A, Pandit AN, Nene U. Pune low birth weight study—a six year follow up. Indian Pediatr 1999; 36:669.

16. Paul VK, Sachdev HS, Mavalankar D, Ramachandran P, Sankar MJ, Bhandari N et al. Reproductive health, and child health and nutrition in India… Lancet 2011; 377:332–349.

17. Juan Emmanuel Dewez et al. Continuous positive airway pressure (CPAP) to treat respiratory distress in newborns in low- and middle-income countries. DOI: 10.1177/0049475516630210.

18. Vento M, Saugstad OD. Resuscitation of the term and preterm infant. Semin Fetal Neonatal Med. 2010;15:216–222.

19. Siew ML, et al. The role of lung inflation and sodium transport in airway liquid clearance during lung aeration in newborn rabbits. Pediatr Res. 2013;73:443–9. [PubMed: 23269118]

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