International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Durga: A Neonatal Rds Case Study

Dr. Aishwarya Rai[1], Dr. Jasmine Anandabai, Dr. Ishika Saxena[3], Pratyush Tyagi[4]

[1,3]Assistant Professor, JRPSCPT
[2]Dean & Principal, JRPSCPT
[4]Student (BPT Intern)

ABSTRACT
This study highlights the neonatal journey of Durga, a six-day-old infant with respiratory distress syndrome, and is reviewed in this case report. She was referred to physiotherapy for care and management. Durga was delivered by C-section at full term. When she was born, her weight was normal. We will discuss Durga's road toward recovery. Her journey is still ongoing as we write this report, which could increase her prospects of enjoying a typical life.

Keywords: RDS, Neonatal, Physiotherapy

INTRODUCTION

RDS, also known as neonatal respiratory distress syndrome, is a common cause of respiratory distress in infants. It often manifests itself a few hours after birth, usually right after delivery. RDS mostly affects preterm newborns, with term infants affected sporadically as well. The incidence of RDS is negatively correlated with the infant's gestational age, with smaller and more preterm neonates experiencing more severe illness. RDS remains the primary cause of morbidity and mortality in preterm infants, despite the fact that treatment techniques such as prenatal corticosteroids, surfactants, and sophisticated respiratory care of the newborn have improved the results for patients affected by the condition.

Because of an eosinophilic membrane that lines the distal airspaces, which are typically terminal bronchioles or alveolar ducts, in autopsies of newborns with respiratory distress syndrome, neonatal respiratory distress syndrome was formerly known as hyaline membrane disease. Lung tissue from newborns with RDS has a ruddy hue that is comparable to hepatic tissue macroscopically. Red blood cells, leukocytes, fibrin, and cellular debris from the lung epithelium make up the hyaline membrane previously discussed. Neonatal respiratory distress syndrome is characterized by premature birth and respiratory distress that usually manifests minutes or hours after delivery. The baby might appear with fewer respiratory sounds and perhaps fewer peripheral pulses. Upon clinical examination, these neonates exhibit cyanosis and poor peripheral perfusion along with signs and symptoms of increased work of breathing, such as tachypnea, expiratory grunting, nasal flaring, retractions (subcostal, subxiphoid, intercostal, and suprasternal), and use of accessory muscles. A consistently decreased air entry is revealed by auscultation. If RDS is left untreated, the baby may become lethargic and apneic as the symptoms get worse over the course of 48 to 72 hours and eventually lead to respiratory failure. Peripheral extremity edema and symptoms of reduced urine production may also occur in the infant.

Atelectasis is a condition that occurs due to the collapse of alveolar units. One of the main characteristics

is a reduction in lung volume, which destabilizes the relationship between ventilation and perfusion and causes pulmonary shunting.[1] The word "atelectasis" is Greek in origin; It is a combination of the Greek words atelez (Ateles) and ektasiz (ektasis)[2]. Preterm neonates' lungs differ from an adult's in both physiological and structural ways, which puts them at risk for atelectasis. Lung immaturity reduces lung compliance by reducing the number of alveoli, low surfactant synthesis, and absentee or underdeveloped collateral ventilation. On the other hand, because of its cartilaginous nature, the chest cavity has more compliance. The primary causes of atelectasis in preterm newborns include the use of mechanical ventilation, improper placement of the endotracheal tube (ETT), mucus plugs, elective or unintentional extubation, and illnesses like pneumothorax, bacterial pneumonia, pleural effusion, bronchopulmonary dysplasia, respiratory distress syndrome, meconium aspiration syndrome, and gastroesophageal reflux. Typically, atelectasis is visualized on chest radiographs as increased density and decreased volume associated with decreased intercostal spaces, deviation of mediastinal structures, such as the trachea and the heart, elevation of the ipsilateral diaphragm and hyperinflation of the contralateral lung.[(5)] However, technical problems, such as X-ray beam underpenetration and inadequate centralization, compromise the quality of the exam, which may result in nonspecific imaging features described as hypolucency or opacity.[3-4]

Specific radiological features may appear on a chest radiograph and may affect a lobe, a segment or the entire lung[5]. Hypolucency, which may indicate pulmonary edema, bleeding, atelectasis, or consolidations, is another radiological characteristic that is commonly seen on the chest X-rays of premature infants. Opacities can result from pleural effusion, lung collapse, or pulmonary infiltrates caused by fluid buildup in the interstitial space as a result of an inflammatory disease. One of the most popular methods for demonstrating atelectasis, opacities, hypolucency, and pulmonary infiltrates is chest radiography. An essential tool for clinical assessment and diagnostic support for patients admitted to the intensive care unit (ICU) is the chest X-ray. The radiological findings unique to each alteration on chest imaging and the factors associated with them are crucial information for physiotherapists working in this field since it helps determine the best course of action for a patient. One of the most frequent respiratory side effects during the perioperative phase is atelectasis, which can cause serious morbidity and mortality, including the emergence of pneumonia and abrupt respiratory failure.

CASE REPORT

D.O.A – 5/12/2023

Demographic Data :

Name: Durga

Age/Gender- 6Days/Female

Ward/Bed-1 – NICU-I

Subjective Assessment :

Chief Complaint – Difficulty in breathing

H/o Present Illness – Difficulty in breathing after 1 hr. of birth. Baby was delivered through C-section weighing 2.7kg at the time of birth.

Intubation just after birth , No H/o Chronic Illness

Past History – No Past History

Medical/surgical/Physiotherapy History – N/A

Personal/Family/Social History – N/A

Objective Assessment :

General Examination –

Vitals sign: as per 13/Dec/2023 , 11:15 AM

- Temp –98.4^{0}F
- B.P. – 76/37 mm hg
- Pulse – 143 bpm
- R.R. – 67 bpm
- SpO_2- 95%

APGAR Score: 5

Component	Scoring
Appearance (Color)	0
Pulse (Heart Rate)	1
Grimace (reflex irritability)	1
Activity (Muscle tone)	2
Respiration	1

On Observation :

- Patient was assessed in supine lying position
- CPAP present
- IVC present
- Chest Deformity - Pectus Excavatum

On Examination :

❖ Auscultation

- Air Entry → Right - present , Left – present
- Breath Sound: Minimal breath sound Rt. Side
- Tachypnea present

Muscle Tone :

- Normal in all Limbs

P/A – Soft, Non-Tender

Reflexes:

- Rooting Reflex – Absent
- Sucking Reflex – Present
- Grasping Reflex – Present
- Babinski Reflex – Present

INTERVENTION:

MEDICAL MANAGEMENT

1. BRONCHODIALTORS

Drug Name	Dosage
Albuterol (Salbutamol)	**0.05-0.15 mg , every 4-6 Hours**
Ipratropium bromide	**25-250 mcg**

2. MUCOLYTICS

Drug Name	Dosage
Acetylcysteine	10-20 mg

PHYSIOTHERAPY MANAGEMENT

SI No.	Intervention	Dosimetry
1.	Manual Hyperinflation	Every 4 hours
2.	Positioning and Postural Drainage	Every 2 hours
3.	Mild Percussions	Every hour
4.	Suctioning	Whenever required
5.	Abdominal Co-contractions	Every two hours; 6 repetitions in three sets
6.	Prom Exercises	Every six hours; 10 repetitions in two sets
7.	Sensory Integration over lips, hands and feet.	Every three hours; 10 repetitions in two sets

PARENTAL EDUCATION:

Educating parents on proper positioning, handling techniques, and recognizing signs of respiratory distress can empower them to actively participate in their infant's care.



DISCUSSION

By increasing the impact of gravity on bronchial clearance, conventional PDPV has been utilized to remove residual airway secretions when the neonate is in postural drainage positions. The main causes of

atelectasis are thought to be accumulated secretions and airway obstruction. Recent research, however, did not support the short-term advantages of PDPV in post-extubation atelectasis[6]. Hyperinflated lung units in newborns with unequal ventilation distribution may compress neighboring lung units and increase the risk of atelectasis. On the other hand, techniques that decompress these enlarged lung units may make atelectasis easier to treat. On hyperinflated lung units, chest wall compressions by percussion or LST should theoretically result in a comparable decompression effect; however, this benefit was not seen in earlier trials using PDPV. More atelectasis may have resulted from the forced and brief oscillations of percussion on the chest wall, which encouraged the emptying of lung units with low time constants (such tiny collapsible airways). LST appears to decompress the hyperinflated, slowly emptying lung units, allowing for easier lung reexpansion.

CONCLUSION

In conclusion, early intervention of physiotherapy shows successful outcomes and must be employed in neonates.

ACKNOWLEDGEMENT

We express our gratitude to Dr. Raj Kumar Sharma, Associate Professor, JRPSCPT for his unwavering support and motivation. We also wish to express our gratitude to Komal Agrahari and the Neonatal ICU team for their commitment to Durga's care. Finally, we would like to express our gratitude to Durga's parents and family for entrusting us with their faith.

AUTHORSHIP STATEMENT

Aishwarya Rai designed the treatment protocol. Jasmine Anandabai counselled the parents of Durga. Pratyush Tyagi helped in the treatment sessions by being a valuable member of the team. Aishwarya Rai and Ishika Saxena prepared the manuscript for publication. No research funding was applied for the study. The manuscript was revised by all authors and approved for the final document.

REFERENCES

1. Johnston C, Carvalho WB. Atelectasias em pediatria: mecanismos, diagnóstico e tratamento. *Rev Assoc Med Bras.* 2008;54(5):455–460.
2. Lundquist H, Hedenstierna G, Strandberg A, Tokics L, Brismar B. CT-assessment of dependent lung densities in man during general anaesthesia. Acta Radiol. 1995 Nov;36(6):626-32.
3. Álvares BR, Pereira IC, Araújo Neto AS, Sakuma ET. Achados normais no exame radiológico de tórax do recém-nascido. *Radiol Bras.* 2006;39(6):435–440.
4. Dominguez MC, Alvares BR. Atelectasia pulmonar em recém-nascidos com doenças clinicamente tratáveis submetidos a ventilação mecânica: aspectos clínicos e radiológicos. *Radiol Bras.* 2018;51(1):20–25.
5. Oliva Hernández C, Lopez de Vergara RG, Galván Fernández C, Marrero Pérez CL. *Atelectasia. Bronquiectasias.* Madrid: Asociación Española de Pediatría; 2008. [2019 Jun 7].
6. Al-Alaiyan S, Dyer D, Khan B. Chest physiotherapy and postextubation atelectasis in infants. Pediatr Pulmonol 1996;21: 227–30