

Effective & Efficient Surfactant Therapy Management on Neonatal outcomes in Newborn Intensive care unit (NICU) at Mehta Multi Speciality Hospitals, a Tertiary care Centre, Chennai, Tamil Nadu, India



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INTRODUCTION

Respiratory distress syndrome (RDS) is primarily due to surfactant deficiency in preterm infants. Surfactant treatment is the standard of care in preterm neonates with RDS. Surfactant therapy has been shown to decrease pneumothorax, BPD, Pulmonary hemorrhage with clinical deterioration, improve oxygenation and reduce the need for extracorporeal membrane oxygenation (ECMO), thus improving newborn survival. Timing of surfactant administration is one of the important Criteria to be considered. Recent evidence still demonstrates that early rescue surfactant (first 2 hours of age) versus late rescue surfactant (After 2 hours of age) is associated with a reduction in BPD and/or death. Therefore, the American Academy of Pediatrics and the European guidelines on surfactant administration advise stabilization of preterm infants on CPAP and, if necessary, the administration of surfactant as early rescue therapy, preferably within 2- 3 hours of age

AIM

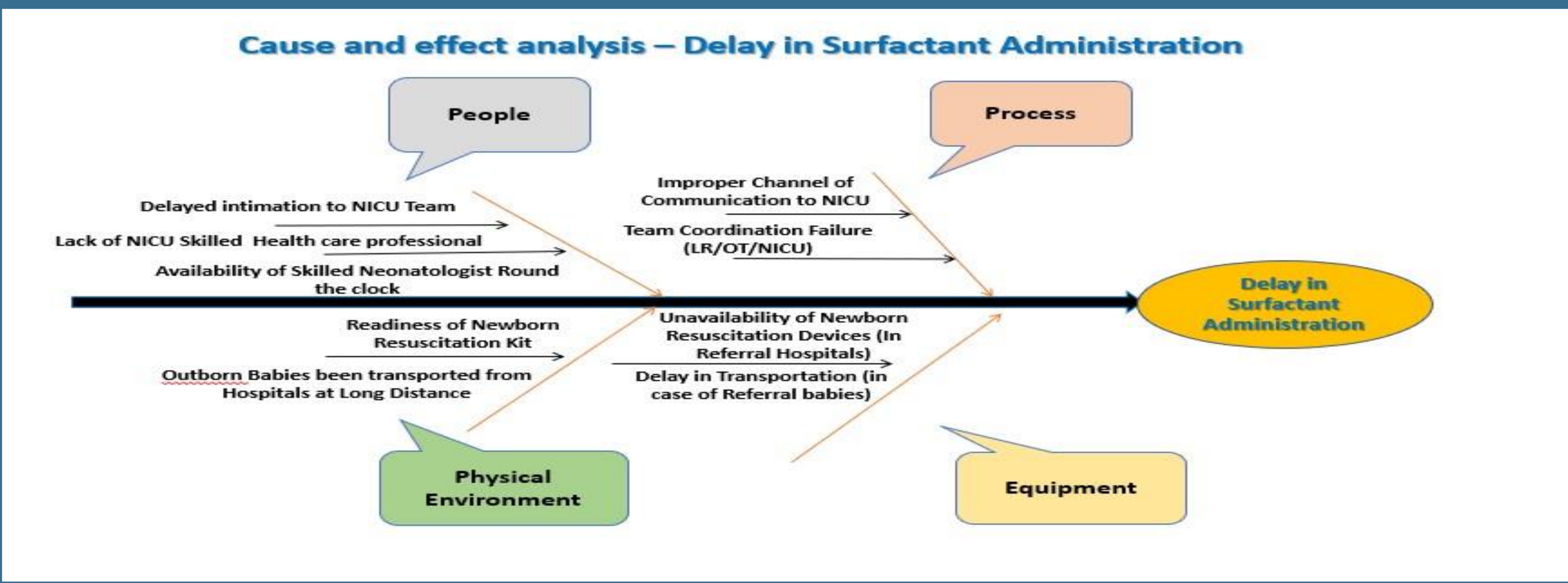
- Aim**
Effective & Efficient Surfactant Therapy Management to improve Neonatal outcomes in Newborn Intensive care unit (NICU)
- Objectives**
 - To assess the Time period of surfactant Therapy Initiation prior implementation of Interventional Strategies.
 - To Identify the gaps for the delay in Initiation of Surfactant Therapy (> 2 hours of birth)
 - To compare the outcomes before and after Implementation of Best practices pertaining to Surfactant Therapy
 - To assess the outcomes of early initiation of surfactant therapy (< 2 hours of birth)

METHOD

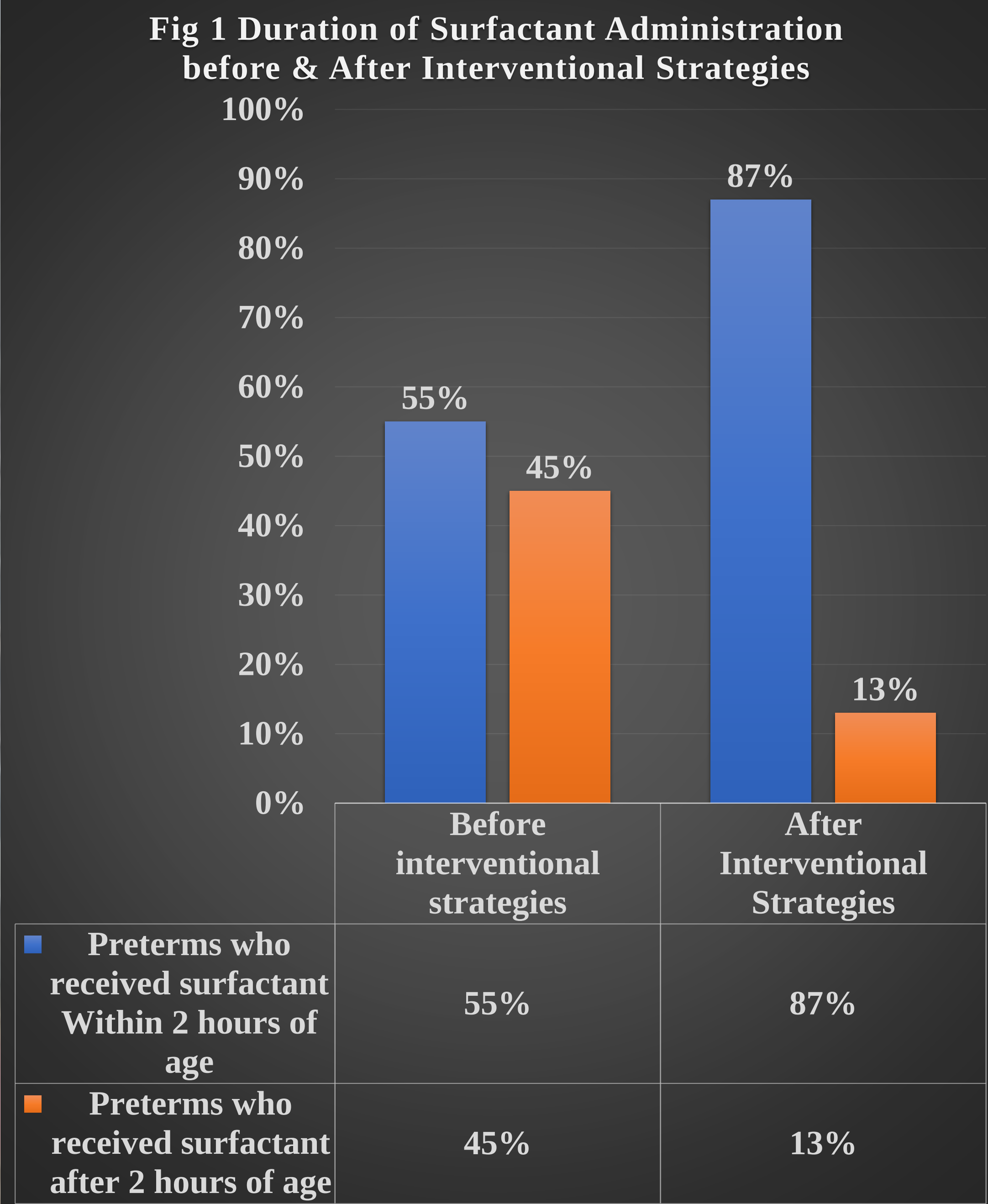
Study Design - Quasi Experimental Study
Setting - Neonatal Intensive Care Unit
Sample size - 36 Pre term Neonates
Sampling technique - Purposive Sampling Technique

- Data collection method**
 - The NICU wished to explore the Existing practice of Surfactant therapy & the duration of its initiation. A meeting with a core team was arranged involving the Nursing In charge, Nursing supervisor, Bedside Nurses, Pediatric Registrars, Neonatologists of NICU and the other Health care workers. Ethical clearance was obtained prior to data collection. Data from 2020 - 2022 (before interventions) was collected retrospectively from patient health records, Risk register and Quality indicators register. The samples included babies who were born inhouse and transported from referral centers.
 - The retrospective data was analyzed, the reason for delay in Surfactant administration was identified and listed down. Based on the reasons and Best practices existing, Initiatives were formulated. The existing team was trained and followed up to ensure that the identified initiatives are put into practice and they are consistent at it. After 3 months of implementation(Jan – Mar 2023), from April 2023 - October 2023, we studied 36 preterm neonates to assess the effectiveness of the Measures taken

RESULTS



- Interventions Impleme**
- People**
 - Prior & Prompt Intimation to NICU Team by the Stake Holders - OT/LR
 - Manpower Availability - Skilled Neonatologist round the clock
 - NICU Skill Training among Health care Professional in NICU through Regular NICU Skill Training with Mannequins
 - Transport team training and preparedness
- Process**
 - Prompt Assessment of Newborn RDS scoring system based on Downe's score & Silverman Anderson Score was standardized
 - Prompt Assessment of Mother Status especially on Steroid therapy & Magnesium Sulphate Therapy been ensured
 - Resuscitation Team Preparedness
- Physical Environment**
 - Zoning & Levels of NICU as per Recommended guidelines
 - Placement of Call Bell system in Labor room to NICU for Timely Intimation
 - Availability of separate Newborn Resuscitation area in Labor room & Operation theatre
- Equipment**
 - Readiness of Newborn Resuscitation kit in Labour room, Operation Theatre and transportation of the same to Referral Hospital
 - Availability of Surfactant stocked in Pharmacy & NICU stock



On Comparison we found that, after implementation of Interventional strategies surfactant administration within 2 hours of Pre term babies birth had improved to 87% which favoured successful Neonatal outcome.

Outcome parameters	Before Intervention (2020- 2022)	After Intervention (2023)
ALOS	3.5	2.5
Mortality Rate	0.5%	0%
Neonatal Sepsis	0.3%	0%
Parental Satisfaction	90%	96%
Average time taken to administer surfactant	2hrs 25 minutes	1hour 53 mins

Results: On Retrospective analysis of Surfactant administration, it was found that 55% of babies received Surfactant within 2 hours of NICU arrival and 45% preterm neonates received after 2hrs. After implementation of Interventional Strategies on Surfactant Therapy, it was found that 87 % of pre term babies received Surfactant therapy within 2 hours of arrival to NICU and 13% of Preterm Neonates received after 2 hours of NICU arrival. Outcomes seen after initiation of surfactant therapy within 2 hours of birth in 2023 out of 75% preterm babies, we noticed that only 12 % required ventilation, 21% required CPAP, 33% had RDS, Nil mortality rate, Nil incidences of Chronic Lung Disease

CONCLUSIONS

Early routine surfactant administration within 2 hours of life as compared to late selective administration significantly reduced the need for Mechanical Ventilation in the first week of life among preterm infants with RDS. Interventional Strategies taken towards Surfactant therapy helped us in achieving successful outcomes in NICU at our Hospital

ACKNOWLEDGEMENT

- Sincere Thanks to management for providing us with all necessary requirements for successful administration of Surfactant for pre term babies in a timely manner.
- Special Thanks to NICU team for the prompt patient care.

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