

Therapeutic Strategies to Reduce Secondary Lung Damage in Preterm Infants

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Background: Mechanical ventilation has been a common method used to support respiratory function in preterm infants, but it may cause serious lung problems. Several strategies have been shown to reduce secondary lung damage including the use of surfactants, steroids, and nasal continuous positive airway pressure.

Purpose: The purpose of this systematic review was to assess the evidence of the strategies used to reduce secondary lung damage in premature infants.

Methods: A systematic literature review of studies of therapeutic strategies implemented with preterm infants to reduce secondary lung damage. Sample inclusion: Studies reporting cross-sectional comparisons, randomized controlled trials, or other case studies from the past ten years. A textword search was conducted using terms: “preterm OR premature infants AND lung damage”, “Nasal Continuous Positive Airway Pressure AND neonate OR preterm”, “surfactant AND neonate OR preterm infant”, “neonatal OR neonate OR preterm AND lung treatment”, or “preterm OR premature infant AND treatment lung disease”.

Results: The initial search yielded 45 articles on this topic. Content evaluation revealed that many were review articles. A total of 20 articles met the sample inclusion criteria. These articles addressed use of: Steroids (3), Surfactant (1), Continuous positive airway pressure (CPAP) (5), Surfactant plus CPAP (3), Steroid plus surfactant (8).

Surfactant is administered directly to the lungs and improves respiratory function immediately; some infants do not have sustained improvements and must receive a booster dose 6 days later. **Steroids** have been administered to the mothers antenatally to improve fetal lung function or to the infant at delivery. Budesonide was safer than Dexamethasone while both improved lung function. **CPAP** reduces time on ventilators. **Surfactant plus CPAP** reduced complications and decreased time on ventilator. **Surfactant plus Steroid** improves lung efficiency while decreasing lung inflammation without negative effects.

Conclusion: The combination therapies, surfactant plus CPAP and surfactant plus budesonide were more effective at improving lung function. The addition of steroids to surfactant reduced inflammation while the combination of CPAP with surfactant reduced time on ventilator and the associated complications of pneumothorax and hemothorax. Combining proven therapies with surfactant was more effective than any therapy alone.