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Humidified high-flow nasal cannula versus nasal CPAP as a respiratory support in preterm infants-non inferiority randomized controlled trial in a tertiary care center

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Background: Respiratory failure in the neonatal period remains a difficult challenge and is associated with high morbidity, mortality and cost. Humidified high flow nasal cannula (HHFNC) is being increasingly used as an alternative form of respiratory support for preterm infants with apnea, respiratory distress syndrome or chronic lung disease, even though limited evidence is available to support the specific role, efficacy and safety in newborns.

Objective: To assess the indications, frequency of usage, efficacy and safety of HHHFNC as compared to nasal CPAP in providing respiratory support in preterm neonates after a period of positive pressure ventilation. (That is post extubation).

Materials & Methods: This study was conducted in a tertiary, level II b Neonatal Intensive Care Unit in North Karnataka, India. In this study, all preterm neonates less than 37 weeks of gestation were placed on one of the respiratory supports (that is HHHFNC or NCPAP), immediately following extubation from mechanical ventilation. The primary outcome measures assessed were death, days on mechanical ventilation, need for reintubation (failure), air leak, nasal injury and Bronchopulmonary dysplasia.

Results: There were no significant differences in major clinical outcomes including death, BPD, ventilator-days, NEC, severe IVH, ROP or time to full feeds. Treatment failure was seen in 12% of infants on HHHFNC compared to 16% on NCPAP (P value=0.48). No significant difference in other outcome measures seen between the groups. No nasal injury was seen in HHHFNC group against 10% in NCPAP group (P value=0.55).

Conclusion: The data presented here indicate that HHFNC may represent a well-tolerated and effective alternative respiratory support mode to NCPAP in the Preterm. High flow support appears safe to use in moderate preterm infants. Larger randomized trials are needed to find its utility in extreme preterm infants and infants with severe respiratory disease as a primary respiratory support.

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