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Noninvasive Neurally Adjusted Ventilation versus Nasal Continuous or Intermittent Positive Airway Pressure for Preterm Infants: A Systematic Review and Meta-Analysis

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Abstract : Background: Noninvasive neurally adjusted ventilatory assist (NAVA) is a relatively new mode of noninvasive ventilation with promising clinical and patient-ventilator outcomes for preterm infants. The aim of this systematic review was to compare NAVA to nasal continuous or positive airway pressure (NCPAP) or intermittent positive airway pressure (NIPP) for preterm infants. Methods: We searched the online databases Medline, Embase, and CENTRAL. We included randomized controlled trials (RCTs) that compared NAVA to NCPAP or NIPP for preterm infants < 37 weeks gestational age. We sought to evaluate the following outcomes: noninvasive intubation failure rate, desaturation rate, the fraction of inspired oxygen (FiO2), and length of stay in the neonatal intensive care unit (NICU). We used the mean difference (MD) to represent continuous outcomes, while the odds ratio (OR) was used to represent dichotomous outcomes. Results: A total of 11 RCTs that enrolled 429 preterm infants were deemed eligible. NAVA showed similar clinical outcomes to NCPAP or NIPP with respect to noninvasive intubation failure (RR for NAVA versus NCPAP: 0.82, 95% confidence interval (CI): 0.49 to 1.37), desaturation rate (RR for NAVA versus NCPAP: 0.69, 95%CI: 0.36 to 1.29; RR for NAVA versus NIPP: 0.58, 95%CI: 0.08 to 4.25), FiO2 (MD for NAVA versus NCPAP: –0.01, 95%CI: –0.04 to 0.02; MD for NAVA versus NIPP: –7.16, 95%CI: –22.63 to 8.31), and length of stay in the NICU (MD for NAVA versus NCPAP: 1.34, 95%CI: –4.17 to 6.85). Conclusion: NAVA showed similar clinical and ventilator-related outcomes compared to the usual care noninvasive respiratory support measures NCPAP or NIPP for preterm infants.

Keywords : preterm infants, noninvasive neurally adjusted ventilatory assist, NIV-NAVA, non-invasive ventilation, nasal continuous or positive airway pressure, NCPAP, intermittent positive airway pressure ventilation, NIPP, respiratory distress syndrome, RDS
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