Nasal high-flow therapy during neonatal endotracheal intubation

SUMMARY:

- Intubating neonates is a high-stress procedure in the ED, largely because it is a highly uncommon occurrence that is becoming even less common with the increased use of noninvasive respiratory support. First-attempt success rates between 25% and 50% have been reported.
- Neonates are at high risk of decompensation during intubation, because of a low functional residual capacity and high metabolic demand.
- Use of nasal high-flow oxygen therapy has greatly increased since the COVID-19 pandemic, and several articles have suggested potential benefits not only in preventing intubation but also during intubation, by prolonging the time to desaturation during apnea induced by rapid sequence intubation.
- In this study, the authors conducted an RCT at 2 NICUs in Melbourne, Australia, where infants undergoing endotracheal intubation were randomized to high-flow therapy or usual care.
- The study excluded patients who were unstable, had an anatomic contraindication to high-flow therapy, or were receiving a nasal intubation.
- The results were stratified by trial center, age (less or more than 28 weeks’ gestational age), and use of premedication.
- All intubations were recorded with a GoPro camera to confirm the documented data collection.
- The authors report on 251 intubations performed in 202 infants in their intent-to-treat analysis.
- The median age was 27.9 weeks, the median weight was 920 g, and the median age was 10 hours.
- The primary outcome of first-attempt success without physiologic instability was seen in 50% of the high-flow group vs 31.5% of the usual-care group, with an NNT of 6.
- In preplanned subgroup analyses, the treatment effect was similar regardless of age or use of premedication, but was amplified when the intubation was performed by an inexperienced operator.
- Other outcomes of interest were that the median oxygen saturation during the first attempt was higher in the high-flow group (93.5% vs 88.5%); among patients who had an episode of desaturation, the time to desaturation was longer in the high-flow group (44.3 seconds vs 35.5 seconds); and the number of attempts, and percentages of esophageal intubations and serious adverse events did not differ between groups.
- This is a highly positive and well-conducted trial indicating clinically important improvements in intubation success and physiologic stability.
- One notable limitation of this trial is that it was not conducted in the ED (25% delivery room and 75% NICU); therefore, whether the findings would be true among only ED physicians is unknown.

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EDITOR’S COMMENTARY: In this very well-conducted RCT from Australia, nasal high-flow therapy improved success rates and physiologic stability in intubation of neonates, with an NNT of 6. It blows my mind that these authors from Australia were able to get this done and provide useful data on a patient population that has massive room for improvement. This highly impactful New England Journal of Medicine article can and will make a difference.

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