Methylprednisolone reduced postextubation laryngeal edema in adults with tracheal intubation

François B, Bellissant E, Gissot V, et al. **12-h pretreatment with methylprednisolone versus placebo for prevention of postextubation laryngeal oedema: a randomised double-blind trial.** Lancet. 2007;369:1083-9.

Clinical impact ratings: Critical Care ★★★★★★★

QUESTION

In adults with tracheal intubation, is 12-hour pretreatment with methylprednisolone more effective than placebo for preventing postextubation laryngeal edema?

METHODS

Design: Randomized placebo-controlled trial.
Allocation: Concealed.*
Blinding: Blinded (clinicians and patients).*
Follow-up period: Up to 24 hours after extubation.
Setting: 7 intensive care units in France.
Patients: 761 patients 47 to 74 years of age (mean age 66 y, 64% men) who were mechanically ventilated for > 36 hours (median duration 6 d) and were to be extubated in the intensive care unit. Exclusion criteria included pregnancy, history of postextubation upper-airway obstruction, tracheostomy, throat disease or surgery, and long-term treatment with nonsteroidal anti-inflammatory drugs or corticosteroids.
Intervention: Intravenous methylprednisolone hemisuccinate (methylprednisolone, Merck, Lyon, France), 20 mg at 12 hours before planned extubation, followed by 20 mg every 4 hours (total dose 80 mg) (n = 380); or placebo (intravenous isotonic saline) (n = 381).
Outcomes: Laryngeal edema (defined as stridor associated with signs of respiratory distress) within 24 hours after extubation. Secondary outcomes included overall reintubation, reintubation secondary to laryngeal edema, and adverse events.
Patient follow-up: 92% (intention-to-treat analysis).

MAIN RESULTS

Fewer patients in the methylprednisolone group had postextubation laryngeal edema, overall reintubation, or reintubation secondary to laryngeal edema (Table). No serious adverse events related to steroid therapy were reported.

CONCLUSION

In adults with tracheal intubation, 12-hour pretreatment with methylprednisolone was more effective than placebo for preventing postextubation laryngeal edema.

Source of funding: Not stated.

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*See Glossary.

12-hour pretreatment with methylprednisolone vs placebo in adults with tracheal intubation†

Outcomes at 24 hours after extubation	Methylprednisolone	Placebo	RRR (95% CI)	NNT (CI)
Laryngeal edema	3.1%	22%	86% (75 to 92)	6 (5 to 7)
Overall reintubation	3.7%	7.6%	52% (8.7 to 75)	26 (14 to 190)
Reintubation secondary to laryngeal edema	0.3%	4.1%	93% (59 to 99)	27 (16 to 53)

†Abbreviations defined in Glossary. RRR, NNT, and CI calculated from data in article.

COMMENTARY

I read this article by François and colleagues, and because it did not reaffirm my perceived clinical experience, I immediately discounted it out of hand—as we are all prone to do. But, as Hippocrates warned, "Experience is delusory," and because the study was so large and well-designed, I set out to evaluate it more carefully.

Taken at face value, the study's implications are clear and reasonably strong. With a number needed to treat (NNT) of only 27 to prevent reintubation and the treatment comprising a few doses of a relatively benign short-term medication (methylprednisolone), it is hard to argue against, and the *Lancet* editorialist agreed (1). My initial inclination to discount the findings of this study was based on my experience that reintubation because of laryngeal edema was rarer than the 4.1% seen in the control group. In fact, literature cited by Francois and colleagues (2, 3) affirms that reintubation rates due to laryngeal edema in previous studies are closer to 1% than to 4%. Since this much lower rate would dramatically affect the NNT, our calculations of the risk–benefit ratio for methylprednisolone become at least somewhat more important.

I do not believe that the clinical question asked in the abstract can be confidently answered given these concerns. I will await a comparable study to address these concerns before I routinely treat my patients as suggested. In the meantime, I will reserve pretreatment with steroids for patients in whom I clinically suspect elevated risk for laryngeal edema, and I will use the method of treatment as described by François and colleagues.

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References

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