

Pretreatment in rapid sequence intubation: Indicated or contraindicated?

To the Editors: In response to Kuzak and associates' Original Research article on the use of lidocaine and fentanyl premedication for neuroprotective rapid sequence intubation (RSI) in the emergency department (ED),¹ it is well known that laryngoscopy and intubation is very stimulating and can lead to significant activation of the sympathetic nervous system and a resultant rise in intracranial pressure. This knowledge has resulted in the common use of pretreatment agents to blunt this "pressor" response.

It is, however, important to realize that the majority of these data have been gathered in the setting of "stable" patients in the non-emergent setting.² Many, if not most, emergency patients requiring intubation have borderline physiologic reserve and are often compensating through catecholamine release. Although lidocaine has not been shown to threaten hemodynamics, it has also not been shown to provide clinical benefit.³ Other pretreatment agents are sympatholytic and have the potential to cause premature homodynamic decompensation even before the induction agent is given. Rapid sequence *induction* (an anesthesiology term) describes intubation for the purpose of providing an anesthetic and has to be differentiated from rapid sequence *intubation*, where an anesthetic is being given to facilitate intubation.⁴ Both terms describe a core procedure that use an induction agent followed by a neuromuscular blocking agent. However, the indications for use and patient population are very different.

The 2 most common potentially life-threatening complications related to ED intubation are hypoxia and hypotension.

Transient hypertension is of unknown clinical significance and would often be welcome in the ED patient population requiring acute airway management. In contrast, hypotension during the resuscitation phase can be devastating in the acute head or heart patient.⁵ Unfortunately, post-RSI hypotension is still occurring with alarming frequency.⁶ This may be a marker of a "sick" ED patient population, but also may represent dosing inexperience. The AIME (Airway Interventions & Management in Emergencies) program instructor group was relieved to read that these pretreatment agents are not being routinely used. The message in our program is clear: keep it simple, facilitate intubation and avoid hypoxia and hypotension.

George Kovacs, MD, MHPE

Department of Emergency Medicine

Kirk MacQuarrie, MD

Department of Anesthesiology

Sam Campbell, MD

Department of Emergency Medicine

And the AIME Instructors

Dalhousie University, Halifax, NS

References

1. Kuzak N, Harrison DW, Zed PJ. Use of lidocaine and fentanyl premedication for neuroprotective rapid sequence intubation in the emergency department. *Can J Emerg Med* 2006;8(2):80-4.
2. Helfman SM, Gold MI, DeLisser E, et al. Which drug prevents tachycardia and hypertension associated with tracheal intubation: lidocaine, fentanyl, or esmolol. *Anesth Analg* 1991;74(4):482-6.
3. Robinson N, Clancy M. In patients with head injury undergoing rapid sequence intubation, does pretreatment with intravenous lignocaine/lidocaine lead to an improved neurological outcome? A review of the literature. *Emerg Med J* 2001;18:453-7.
4. Dronen S. Rapid-sequence intubation: a safe but ill-defined procedure. *Acad Emerg Med* 1999;6:1-2.
5. Brain Trauma Foundation. American Association of Neurological Surgeons. Joint Section on Neurotrauma and Critical Care. Initial management. *J Neuro-*

trauma 2000;17:463-9.

6. Reid C, Chan L, Tweeddale M. The who, where, and what of rapid sequence intubation: prospective observational study of emergency RSI outside the operating theatre. *Emerg Med J* 2004;21:296-301.

[The authors respond:]

We thank Drs. Kovacs, MacQuarrie and Campbell for their response on behalf of the AIME Instructors to our study evaluating the use of pretreatment for neuroprotective rapid sequence intubation (RSI) in the emergency department (ED).¹ We agree that every attempt should be made to avoid hypoxia and hypotension in all patients undergoing intubation in the ED, and agree that in some scenarios the simplest approach is the best. However, we were disappointed to hear the opinion that pretreatment is contraindicated, and were further disappointed to hear that the findings of our study that pretreatment drugs were not being routinely used were welcomed by the AIME group.

Clearly there is a lack of evidence involving hard end points demonstrating improved clinical outcomes when pretreatment is administered, and further research is necessary in this area. That said, we disagree with the conclusion of the AIME Instructors that pretreatment is therefore contraindicated in patients undergoing neuroprotective RSI in the ED. Although the issue requires further study we suspect that this opinion is not shared by the majority of emergency medicine clinicians who, rather than discard the use of potentially beneficial treatment agents, carefully consider the selective use of pretreatment in patients who may benefit from this intervention. The 2006 edition of *Rosen's Emergency Medicine* textbook makes the following statement regarding this issue:

There is evidence supporting the physiologic benefits of these agents, but outcome data are lacking, so individualization is necessary, and critical time should not be lost administering pretreatment drugs if the patient requires immediate intubation. Despite the lack of outcome studies, there is considerable inferential evidence supporting this approach, and these agents probably provide protection for vulnerable patients against the adverse hemodynamic and intracranial effects of laryngoscopy and intubation.²

Research done at our centre has provided evidence supporting the physiologic benefit of pretreatment agents.³ In addition, we recently published a study of 522 intubations using etomidate, many of which also involved the use of pretreatment agents. This study demonstrated that our approach was associated with hemodynamic stability in a heterogeneous group of patients undergoing RSI in the ED.⁴ Our conclusion from the existing literature remains unchanged; premedication should be considered in selected patients undergoing neuroprotective RSI in the ED. The appropriate selection and dosing of medications in such cases provides the best opportunity to minimize post-intubation hypotension and other complications of intubation.

Peter J. Zed, BSc, BSc(Pharm), PharmD, FCSHP

David W. Harrison, MD

Nick Kuzak, MD

CSU Pharmaceutical Sciences and Department of Emergency Medicine
Vancouver General Hospital
Faculty of Pharmaceutical Sciences
and Faculty of Medicine
University of British Columbia
Vancouver, BC

References

1. Kuzak N, Harrison DW, Zed PJ. Use of lidocaine and fentanyl premedication for neuroprotective rapid sequence intubation in the emergency department. *Can J Emerg Med* 2006;8(2):80-4.
2. Walls RM. Airway. In: Marx JA,

Hockberger RS, Walls RM, et al, editors. *Emergency medicine: concepts and clinical practice*. 6th ed. Missouri: Mosby; 2006. p. 2-26.

3. Zed PJ, Abu-Laban RB, Harrison DW. Effect of fentanyl pretreatment on sympathetic response in patients with cerebrovascular accident undergoing rapid sequence intubation in the emergency department [abstract]. *Can J Emerg Med* 2004;6(3):197.
4. Zed PJ, Abu-Laban RB, Harrison DW. Intubating conditions and hemodynamic effects of etomidate for rapid sequence intubation in the emergency department: an observational cohort study. *Acad Emerg Med* 2006;13:378-83.

Treatment of patients with severe sepsis and septic shock: real-life lessons

To the Editors: Evidence-based therapies for severe sepsis and septic shock include broad spectrum antibiotics, early goal-directed resuscitation, corticosteroids, glycemic control and recombinant human activated protein C (rhAPC).¹ Prior to dissemination of the Surviving Sepsis Guidelines in 2004,¹ we found that 94% (32/34) of our septic patients received greater than 20 mL/kg intravenous fluid within 6 hours, that 85% (29/34) received low-dose corticosteroids, that 68% (23/34) received antibiotics within 3 hours, and that 82% (29/33) received rhAPC within 24 hours of admission to the intensive care unit. At the same time, only 38% (13/34) received central venous pressure monitoring, and only 6% (2/34) had central venous oximetry performed within 6 hours. This “care-gap” offers a provocative area for research and improvement.

Pharmaceutical companies have provided a great deal of education focused on products such as rhAPC. Unfortunately, educational funding to promote the use of equally efficacious but inexpensive therapies, such as steroids, fluids or pressure monitoring, is lacking. Early goal-directed therapy saves lives, and mortality increases for each hour that appropriate antibiotics and fluid re-

suscitation are delayed.^{2,3} With any time-dependant therapy, it is necessary to expedite a continuum of care. The concepts of “chain-of-survival,” “door-to-drug time” and “taking treatment to the patient” are as relevant to sepsis as they are to acute coronary syndromes (ACS) — perhaps more so, given the high incidence, mortality and cost of severe sepsis and septic shock — yet sepsis has not received the same level of attention or funding as ACS.^{4,5}

Just as with ACS, the first step is deciding that delays are unacceptable. Comprehensive therapy can only begin once a disease is brought to medical attention. Yet few hospitals triage septic patients in the same aggressive fashion they do for ACS. Pre-hospital sepsis care is unusual; pre-hospital cardiac care is the norm. Early and aggressive treatment of severe sepsis and septic shock will save many lives. Our challenge is to convert guidelines into meaningful clinical practice and change.⁶ We have work to do.

Jonathan S. Davidow, MD

Departments of Emergency Medicine and Critical Care Medicine

Peter G. Brindley, MD

Department of Critical Care Medicine

Michael J. Jacka, MD, MSc

Departments of Critical Care Medicine and Anesthesiology & Pain Medicine

R.T. Noel Gibney, MB

Department Critical Care Medicine
University of Alberta
Edmonton, Alta.

References

1. Dellinger RP, Carlet JM, Masur H, et al. Surviving sepsis campaign guidelines for management of severe sepsis and septic shock. *Crit Care Med* 2004;32:858-72.
2. Ronald J, Suppes R, Gulati H, et al. The effect of timing of antimicrobial administration on mortality in septic shock patients. *Can J Anaesth* 2005;54:A4.
3. Rivers E, Nguyen B, Havstad S, et al. Early goal-directed therapy in the treatment of severe sepsis and septic shock.