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 & Managament 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.

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[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.

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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 resuscitation 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.

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Prehospital intubation for severe head injury

To the Editors: We greatly appreciated the detailed, yet succinct Journal Club summary by Topping and Ducharme[1] of Wang and colleagues' paper[2] on the deleterious association demonstrated by pre-hospital intubation in the seriously head-injured patient versus emergency department intubation of a similar cohort.

Topping and Ducharme[1] carefully defined the population studied; the quality of the database used; the methodology for analysis (including use of a propensity score); the challenges of a possible randomized controlled trial to further delineate causation versus the clear association that has been recently demonstrated in several emergency medical services (EMS) intubation studies, including this one; and the lessons associated with unbridled enthusiasm for unproven yet seemingly common-sense interventions (i.e., pre-hospital intubation in significantly head-injured patients).

However, one key result from this large study[2] seemed to elude the reviewers. In Wang and colleagues' study one group of pre-hospital providers (air medical transport crews) who used neuromuscular blocking agents had decreased mortality demonstrated in the population studied. Although Wang and colleagues qualify clear conclusions in this regard by pointing out that these 2 elements were used as covariates in the overall regression analysis, the impression is clearly given that this is an area that needs further study before the brush of nihilism for endotracheal intubation in the EMS environment is finalized. Indeed, several EMS air medical studies (observational in nature), where a small cohort of highly trained crew members are given intensive training and reasonable ongoing critical care exposure, have demonstrated exceptional airway management skills.[3,4] Wang and colleagues' findings are consistent with another recent study that also showed an association with improved outcomes using this air medical model.[5]

We feel that Wang and colleagues' suggestive data on air medical rapid sequence intubation management in the seriously ill head-injured patient deserves further consideration and is of key interest to EMS physicians and providers.

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Les lettres seront considérées pour publication si elles sont pertinentes à la médecine d'urgence en milieu urbain, rural, communautaire ou universitaire. Les lettres en réponse à des articles du *JCMU* publiés antérieurement devraient parvenir au siège social du *JCMU* à Vancouver (voir titre pour plus de détails) moins de six semaines après la parution de l'article en question. Les lettres ne devraient pas avoir plus de 400 mots et cinq références. Pour des raisons d'espace et par souci de concision et de clarté, certaines lettres pourraient être modifiées.