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COMMENT & RESPONSE

Intubation Practices and Adverse Peri-intubation Events in Critically Ill Patients

To the Editor We have several comments about the recent study[1] describing intubation practices and peri-intubation events in critically ill patients from 29 countries. First, previous studies concerning peri-intubation morbidity in critically ill patients have demonstrated that early identification and strategic management by skilled and experienced clinicians can save lives.[2,3] Although it is reassuring that fewer adverse events were reported in this study[1] when patients underwent intubation by attending physicians, the lesson learned from the UK's National Emergency Laparotomy[4] audit and from the Emergency Anesthesia Services Guidelines that followed is that critically ill patients requiring intubation deserve attending-level care. Sadly, this lesson has not been widely operationalized, as resident physicians were responsible for intubating 52% of the patients in this study.[1] More information regarding resident experience level, their intubation skills, and the immediate availability of senior level backup would be of interest.

Second, we disagree that the role of video laryngoscopy remains unclear. What is clear is that video laryngoscopy, like any tool used to facilitate tracheal intubation, requires proficiency to achieve successful intubation.[5] Third, we believe that the identification of specific risk factors should inform clinical management when caring for critically ill patients who require high-risk interventions.[2] In this study,[1] intubation itself was unlikely to be the cause of cardiovascular instability, which developed in 42.5% of patients. Instead, the administration of propofol, a sympatholytic induction agent that can cause hypotension, was used in 41.5% of patients and likely precipitated cardiovascular instability. Use of vasopressors to mitigate the predictable effects of sympatholytic induction agents is critical to the management of patients at high risk of hypotension due to impaired physiological reserve.

Fourth, although the vehicle for preoxygenation was described, this study[1] did not provide information about the method for achieving alveolar denitrogenation. Moreover, even though rapid sequence induction was performed in 62% of patients, the use of succinylcholine and rocuronium to facilitate rapid intubation was low, which may enhance trauma to the oropharynx. Information about paralytic dosing would also be of interest. In addition, this study documented woeful underutilization of waveform capnography (used in 25% of patients) and colorimetric CO_2 detection (used in 7.5% of patients), both of which should be considered the standard of care.

Airway management in critically ill patients requires a plan, highly experienced clinicians, wise choice of pharmacologic options, facility with airway equipment, and a system that focuses on confirmation of correct tracheal intubation to minimize morbidity and mortality.

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Conflict of Interest Disclosures: None reported.

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To the Editor In their recent study[1] about the incidence and nature of adverse peri-intubation events in critically ill patients from 29 countries, Dr Russotto and colleagues reported that 45.2% of patients experienced at least 1 major adverse peri-intubation event, such as cardiovascular instability and severe hypoxia, and 3.1% had a cardiac arrest.

We believe the authors omitted an important discussion about the possible adverse effects of rapid sequence induction, which was used in 62.2% of patients in this study. It is well-known that rapid sequence induction can greatly contribute to hemodynamic and respiratory collapse in such critically ill patients[2] due to simultaneous infusion with general anesthetics and neuromuscular blocking agents.

In addition, awake tracheal intubation[3] may be a helpful alternative airway management procedure for critically ill patients. Although it requires a skilled anesthesiologist and patient cooperation, awake tracheal intubation can be safely achieved without use of neuromuscular blocking agents and requires less sedative medication. Recent consensus strongly

supports the use of awake tracheal intubation for patients at high risk of hypoxemia to maintain spontaneous breathing.[4]

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In Reply We agree with Drs Bloomstone and Eckhardt that operator skill may play a major role in the success of tracheal intubation and in patient outcomes peri-intubation. In our large international cohort,[1] the first attempt at tracheal intubation was performed by a resident physician in 52% of cases. Fifty-four percent of these residents were training in anesthesia and were typically performing 2 to 5 intubations per week. We also collected information on the total number of physicians skilled in performing intubation who were immediately available during the procedure. In 53% of intubations, only 1 skilled physician was present, while 2 to 3 skilled physicians were present in 40% of cases. After a first unsuccessful intubation attempt, in 57% of cases, an attending physician performed a successful intubation.[1]

We concur with Bloomstone and Eckhardt that video laryngoscopy is a powerful tool for airway management of critically ill patients because it provides improved visualization of the glottis and allows the opportunity for direct expert supervision of the procedure. However, in a recently published meta-analysis of randomized trials, video laryngoscopy did not increase first-attempt intubation success or improve patient outcomes in the intensive care unit.[2] We agree that specific training in video laryngoscopy is critical and we support the goal of having a video laryngoscope available in every intensive care unit. However, additional evidence is required before the systematic use of video laryngoscopy can be recommended for all critically ill patients undergoing intubation.[3]

The observational nature of our study[1] prevented us from making practice-changing recommendations. The high incidence of major peri-intubation adverse events may have been influenced by the bundle of peri-intubation interventions, including the selection of induction agents. In a post hoc multivariable analysis, propofol was not significantly associated with the primary outcome of major adverse peri-intubation events. However, we cannot exclude a negative effect of propofol in patients with underlying hemodynamic instability. We did not observe an association with use of muscle relaxants and major adverse peri-intubation events.

In regard to the comments by Dr Masuda and colleagues about awake intubation in critically ill patients, we agree that coadministration of induction agents and muscle relaxants, along with the abolishment of spontaneous ventilation during positive-pressure ventilation, may contribute to peri-intubation hemodynamic instability, severe hypoxia, and cardiac arrest. Although mentioned as an option by international guidelines, awake intubation has several practical limitations in critically ill patients. Factors such as the urgency of the procedure, potential for limited patient cooperation, and presence of secretions and blood can make fiberoptic intubation a challenging procedure for even the most highly skilled physicians.[4] Rapid sequence induction, currently considered standard procedure in critically ill patients, was used in 62% of patients undergoing intubation in our large international cohort.[1] We agree that strategies to minimize major peri-intubation adverse events should have a high priority for research in critical care.

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Surprise Billing in Health Care

To the Editor The recent Viewpoint[1] by Dr Colla on surprise billing did not discuss a key aim of the recently passed No Surprises Act[2]: incentivizing clinicians and insurers to