Surrogates or Outcomes: What Should We Measure?

To the Editor,

I read with great interest the article by Girsberger and colleagues in a recent issue of Anesthesiology.1 The authors investigated 36 patients and concluded that postvoid residuals were significantly lower using ropivacaine compared with bupivacaine for thoracic epidural analgesia reflecting less impairment of detrusor function with ropivacaine. The authors should be congratulated for performing a well-designed randomized trial on an important topic in perioperative medicine. One may argue that by using ropivacaine for thoracic epidurals, the risk of urinary tract infection may be reduced with important consequences for patients and healthcare systems.2,3

Although the authors performed a well-conducted study, some concerns require clarification to further establish the clinical importance of the study. The authors identified a significant mean difference (95% CI) in postvoid residuals between groups of −175 ml (−295 ml to −40 ml). I wondered why the authors did not measure or report the need for postoperative bladder catheterization, given that this has been more directly related to poor outcomes. It is possible that a large proportion of patients had small postresidual differences and did not require bladder catheterization.4 In addition, I could not determine whether the intraoperative management of these patients was standardized for anesthetics and analgesic agents, given that many of these agents (e.g., opioids, volatile anesthetics) can potentially alter the primary outcome.5,6

I welcome some clarifications from the authors that could further confirm the validity of this important study.

Competing Interests

The author declares no competing interests.

Mark C. Kendall, M.D., Warren Alpert Medical School, Brown University, Providence, Rhode Island. mark.kendall@lifespan.org

References


In Reply:

We thank Dr. Kendall for his repeated interest in our investigations and his valuable comments.

Dr. Kendall’s first concern was our choice of primary outcome (i.e., differences in postvoid residual urine volume rather than the need for bladder catheterization), arguing that the need for bladder catheterization is related to poor outcome.1 Indeed, bladder catheterization is linked with urinary tract infections and patient discomfort.2 We chose a change in postvoid residual because elevated postvoid residuals are a common reason for bladder catheterization. Therefore, postvoid residual is not only a surrogate of voiding dysfunction, but also directly linked to poor outcomes. Our study was underpowered to assess significance in the rate of urinary tract infections, but this was not the focus of our study. Changes in postvoid residual, however, are a very sensitive value for lower urinary tract function in general and an acknowledged sign of its dysfunction, which was the target of assessment in this randomized clinical trial. The International Consultation on Benign Prostatic Hyperplasia defines a postvoid residual of 50 to 100 ml as abnormal.3 Based on precedent observations4 the primary endpoint, change in postvoid residual, indicates a relevant change in lower urinary tract function.

Dr. Kendall also pondered the lack of reporting the need for postoperative bladder catheterization. In the study setting the bladder catheter always was left in place until the postoperative urodynamic investigation. However, we did report that 4 of 19 patients (21%) in the bupivacaine group and 2 of 17 patients (12%) in the ropivacaine group had a maximum flow rate of 0 ml/s postoperatively and were unable to void, which is an absolute indication for catheterization. It is of utmost importance to avoid urinary retention postoperatively because this is a bladder distension beyond the maximum capacity and is associated with bladder ischemia and the resulting bladder dysfunction.5

Dr. Kendall’s second concern was the lack of information concerning intraoperative pain management. General anesthesia was induced with fentanyl 2 µg/kg and propofol 2 mg/kg. Orotracheal intubation was facilitated with rocuronium 0.6 mg/kg and boluses were given for intraoperative muscle relaxation to maintain no response to...
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Airway Management: The Less Popular Skill of Bag-mask Ventilation

To the Editor:

As anesthesiologists, it is encouraging that recent attention has been paid to airway management improvements in and out of the operating suites. Our goals of positive patient safety outcomes have led to many recent airway management publications. The most recent of which included the investigation of the temporal trends in difficult and failed intubations over a 14-yr period (2002 to 2015) by Schroeder et al.\(^1\) in the March 2018 issue of Anesthesiology.

Airway management outcomes have improved through enhanced education, better airway algorithms, and innovations in airway management. Mask ventilation, the precursor to intubation, has unfortunately received minimal attention over the same period. We contend that mask ventilation is as important as intubation, but it is commonly a less popular skill to teach and learn. As airway management experts, we believe it is our duty to educate the healthcare community on the importance of mask ventilation improvement strategies.

Skills required for bag-mask ventilation and endotracheal intubation are very different, although they are taught, at most times, simultaneously. As educators in airway management, we believe the primary focus should begin with mastery of mask ventilation before endotracheal tube insertion because it is not uncommon to encounter situations of both difficult ventilation and intubation that will ultimately call upon this much-needed skill.

Improvements in mask ventilation beyond the ergonomics of different masks and noninvasive strategies have been lacking, and recent studies further lend support to this need. The difficult intubation rates in the out-of-hospital setting have been reported to be between 9 and 11% both in the United States,\(^2\) where emergency medical technicians and paramedics are the frontline, and in Europe, where anesthesiologists are present in the field. Because bag-mask ventilation is a skill that is equivalent to—if not more important than—intubation, our education should focus on greater implementation and training of this specific skill. Highlighting the importance of mask ventilation is a recent study by Jabre et al.,\(^3\) in the February issue of JAMA. The study saw similar neurologic outcomes with either airway modality of bag-mask ventilation or endotracheal intubation after out-of-hospital cardiopulmonary arrest,\(^3\) which supports the value in teaching, learning, and ultimately mastering this less noteworthy skill.

The education level of the practitioner is questioned by Lewis and Gausche-Hill\(^4\) regarding the study of Jabre et al.,\(^3\) Lewis and Gausche-Hill\(^4\) illustrate the differences between emergency response teams in Europe and America. In Europe, physicians are part of the ambulance care team and thus are the first responders who perform the intubations. Comparatively, in the United States, the emergency responders are largely paramedics, who often lack training in airway management proficiency compared with anesthesiologists, emergency physicians, and intensivists.

We applaud our colleagues for improvements in airway support over the past decade, but bag-mask ventilation is seldom a topic of research. Our airway management education begs for focus on improving our mask ventilation techniques to reproduce the results of Jabre et al.\(^3\) Most recent research

References