Research

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Neuromuscular Relaxation Communication

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1. Abstract

1.1. Background: Surgeons and anesthesiologists share responsibility for achieving optimal operative conditions, yet their priorities regarding neuromuscular relaxation may differ. Surgeons often require deep neuromuscular relaxation to facilitate exposure and closure, whereas anesthesiologists must also consider timely reversal, extubation, and operating room efficiency. These differing objectives may contribute to communication challenges during surgery.

1.2. Methods: A cross sectional, internet based survey of anesthesiologists and surgeons was conducted from November 14 to December 4, 2013. Participants answered questions addressing pre operative, intra operative, and post operative communication related to neuromuscular relaxation in both open and laparoscopic procedures.

1.3. Results: The survey was completed by 256 anesthesiologists and 254 surgeons. Surgeons most commonly requested additional neuromuscular relaxation during open procedures due to difficulty closing the incision (86%), while during laparoscopic procedures the most frequent reason was patient breathing or straining while intubated (89%). Anesthesiologists reported complying with surgeons' requests by administering additional neuromuscular blockade approximately 60% of the time, using alternative strategies in the remaining cases. The most frequently cited reasons for declining additional neuromuscular blockade were proximity to the end of surgery (48%) and the belief that the patient was already adequately relaxed (38%).

1.4. Conclusions: Requests for additional neuromuscular relaxation late in surgery often conflict with anesthesiologists' goals of rapid reversal and timely extubation. Strategies that ensure adequate surgical relaxation while maintaining patient safety and efficient recovery should be further investigated.

2. Introduction

Operating room care is delivered by multidisciplinary teams that include surgeons, anesthesiologists, and nursing staff. Effective communication among these professionals is critical to ensuring patient safety and high quality outcomes. Prior research has demonstrated that communication failures are a major contributor to surgical errors and inadvertent patient harm. Studies have shown that breakdowns in communication account for a substantial proportion of surgical errors, particularly those occurring during the intra operative phase and often involving attending surgeons.
Commonly reported weaknesses in operating room communication include poor information handoffs, lack of standardized processes, limited team integration, and unclear delineation of responsibilities. Despite recognition of these issues, limited research has examined specific clinical contexts in which communication gaps arise. One such context is the management of neuromuscular relaxation during surgery.
The present study examines the perspectives and experiences of surgeons and anesthesiologists regarding neuromuscular relaxation, with a particular focus on how communication influences decision making before, during, and after surgery. By characterizing these interactions, this research aims to identify factors that contribute to communication gaps and inform strategies to improve intra operative collaboration.

3. Materials and Methods

Survey content was developed with input from a practicing surgeon and anesthesiologist to ensure clinical relevance and accuracy. Both clinicians participated in structured discussions with the study authors to identify common surgical scenarios and refine survey questions. The draft survey was subsequently reviewed and pre tested by eight physicians, including four anesthesiologists and four surgeons, who completed the survey while participating in qualitative interviews. Feedback from these sessions was incorporated into the final survey instrument.
Participants were recruited from the American Medical Association Masterfile, the Harris Interactive Physician Panel, and additional U.S. based physician panels. Invitations were distributed via e mail or postal mail and included access information for a secure online survey. All participants provided informed consent prior to participation.
Eligibility criteria included current practice in the United States, licensure as a surgeon or anesthesiologist, 2 to 30 years of clinical practice, and involvement in at least 15 surgical procedures per month, including a minimum of five laparoscopic cases.

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Respondents who met these criteria completed the full survey.

Collected demographic and professional data included age, gender, practice setting, years of experience, types of procedures performed, and typical procedure duration. In addition to general questions about communication practices, the survey included four standardized surgical scenarios designed to assess decision making related to neuromuscular blockade under varying clinical conditions. Institutional Review Board approval for the study was obtained prior to survey administration.

4. Statistical Analysis

Data were analyzed descriptively to summarize attitudes, preferences, and reported practices. Analytical methods included calculation of means, medians, frequencies, and cross tabulations to compare responses between surgeons and anesthesiologists and across practice settings.

5. Results

5.1. Respondent Characteristics

Anesthesiologists reported an average of 15 years in practice, while surgeons averaged 13 years. Both groups had substantial experience with laparoscopic procedures. Anesthesiologists were involved in a higher monthly volume of surgical cases compared with surgeons. Most respondents practiced in community hospitals, with smaller proportions working in academic medical centers or ambulatory surgical facilities.

Physicians practicing in academic medical centers generally reported fewer years of experience, lower procedural volumes, and less laparoscopic experience compared with those in community or ambulatory settings.

5.2. Communication Practices

Both surgeons and anesthesiologists overwhelmingly rated communication as essential to optimal surgical outcomes. However, respondents noted that communication quality was higher among clinicians who worked together regularly and lower among those who collaborated infrequently. Post operative management plans were discussed in fewer than one third of cases, most often omitted because the procedure was considered routine.

5.3. Intra operative Communication and Neuromuscular Relaxation

Surgeons reported requesting additional neuromuscular relaxation in approximately one quarter of procedures and rarely specified the method to be used. Requests were more common among surgeons practicing in academic settings and those frequently performing pediatric cases.

When surgeons requested additional relaxation, anesthesiologists reported administering neuromuscular blockade in about 60% of cases. In situations of disagreement, anesthesiologists often employed alternative strategies such as deepening anesthesia or administering hypnotic or opioid agents rather than additional neuromuscular blockade.

5.4. Factors Influencing Decision Making

Surgeons most often requested additional neuromuscular relaxation during open procedures when encountering difficulty with closure or muscle tightness, and during laparoscopic procedures when patient movement or limited working space compromised visualization. Anesthesiologists identified patient breathing or straining and surgeon request as primary factors prompting administration of neuromuscular blockade. The most influential factor limiting additional neuromuscular blockade was proximity to the end of the procedure, due to concerns about reversal and post operative respiratory function, particularly in obese patients.

6. Discussion

Although surgeons and anesthesiologists recognize the importance of communication, reported practices suggest that opportunities for miscommunication remain, particularly regarding post operative planning and late stage intra operative decisions. Surgeons tend to request additional neuromuscular relaxation toward the end of procedures, precisely when anesthesiologists are least likely to administer it due to concerns about timely recovery and ventilation. Anesthesiologists frequently rely on clinical judgment rather than objective monitoring when assessing the adequacy of neuromuscular relaxation, which may contribute to differing perceptions between team members. When disagreements arise, anesthesiologists often adjust anesthetic depth rather than explicitly discussing alternative strategies with surgeons.

Future approaches should focus on techniques that provide reliable surgical relaxation while allowing for rapid and complete reversal. These may include optimized use of reversal agents, development of shorter acting neuromuscular blockers, or standardized communication protocols to align expectations between surgeons and anesthesiologists.

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