26401 - A RANDOMIZED, CONTROLLED CLINICAL TRIAL OF THE NEUROMUSCULAR BLOCKADE ADVISORY SYSTEM (NMBAS)

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INTRODUCTION: The traditional approach to neuromuscular blockade is one of sequential overdoses. Overdosing eliminates fine control crucial to procedures where neuromuscular function must be ascertained perioperatively; increases the risk of toxicity (see [1]); and result in delay should complications change the surgical conditions. We have developed a Neuromuscular Blockade Advisory System (NMBAS) advising anesthesiologists on rocuronium dose magnitude and timing for maintenance of NMB at surgically favourable, yet easily reversible levels. We conducted a prospective randomized, controlled clinical trial to investigate NMBAS safety and effectiveness, testing the hypotheses that NMBAS is at least as safe as, and provides better care as compared to standard practice.

METHODS: With informed consent and approval of the trial protocol by the institutional Ethics Board, we enrolled 36 patients (11 control, 13 treatment, 12 withdrawals) undergoing surgeries of at least 1.5 hours and required to receive rocuronium throughout the case. Patients with rocuronium sensitivity, and health conditions affecting rocuronium metabolism and monitoring of NMB were excluded. Patients were randomized to standard care and care with NMBAS advice groups. Neuromuscular response data, drug use and physiological parameters were recorded. Safety was assessed by the incidence of intra- and post-anesthetic clinically relevant events. Quality of care was judged by deviation of neuromuscular response from a surgically useful and easily reversible level of blockade, requirements for NMB and anesthetic drugs, and timing of clinically significant events. Patients and data analysts were blind to group assignment.

RESULTS: Patient demographics, procedures, drug use, and ability to maintain surgically favourable conditions with easy reversibility were equivalent between the two groups. The incidence of adverse events was half for NMBAS as compared to control. Of note, inadequate surgical relaxation occurred in one case versus eight, and breathing against the ventilator occurred in five cases versus nine for control. Train-of-4 ratios of the fourth to first twitch at reversal were 18 and 3%, and at extubation were 73 and 55% for the NMBAS and control groups respectively.

DISCUSSION: NMB administration guided by NMBAS was associated with a reduction in perioperative adverse events demonstrating increased safety. NMBAS showed improved neuromuscular function at reversal and extubation compared to standard practice, implying decreased risk of post-operative adverse events. NMBAS is an innovative technology with the potential to significantly improve patient safety in patients receiving NMB.

REFERENCES: [1] Anesth Analg 2004 98:193-200.