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EFFICACY OF PARAVERTEBRAL NERVE BLOCKADE IN THORACOSCOPIC PROCEDURES

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Introduction: Video-assisted thoracoscopic surgery (VATS) for pulmonary resection is increasingly popular. The obligate chest tube and chest wall incisions result in significant post-operative pain with concomitant negative effects on pulmonary mechanics. Patients undergoing VATS mirror thoracotomy patients regarding decreases in postoperative FVC and FEV1 on the first post-operative day.[1] However, VATS patients typically have shorter pain duration, earlier chest tube removal, and earlier hospital discharge.[2] The optimal analgesia regimen for the VATS population has not been elucidated. The ideal anesthetic would provide a minimally sedating, short-term, intense analgesia that modulates the adverse effects of surgery on the neuroendocrine stress response and pulmonary function. We hypothesize that for VATS patients, pre-emptive analgesia with unilateral paravertebral nerve blockade (PVB) provides superior analgesia compared to conventional patient-controlled intravenous analgesia (PCA).

Methods: With IRB approval, 26 adult patients undergoing elective unilateral thoracoscopic procedures were enrolled in a double-blinded, prospective, randomized pilot study of multi-level, single-dose paravertebral nerve blockade. The patients were randomized to receive either paravertebral injections with 5ml of 0.5% bupivacaine (treated) or preservative-free saline (control) at each level. The PVB injections were performed unilaterally at six spinal levels from T4 through T9 by a select group of attending anesthesiologists. All patients had a standardized intraoperative anesthetic and post-operative analgesia regimen including ketorolac and PCA morphine. Cumulative PCA morphine usage adjusted for body weight was used to assess efficacy of regional analgesia in the treated group compared with controls.

Results: The treated group showed a 24% decrease in PCA morphine usage compared to the control group ($p=0.023$). The mean cumulative dose of PCA morphine adjusted for body mass was $0.31 \text{ mg/kg} \pm 0.027$ in the treated group versus $0.41 \text{ mg/kg} \pm 0.031$ in the control group (Figure 1).

Discussion: Results of this pilot study showed improved analgesic efficacy with PVB-treated patients compared with placebo. Based upon these results, an ongoing clinical trial sponsored by the Foundation for Anesthesia Education and Research is underway. This trial of eighty thoracoscopic surgical patients will further define the analgesic efficacy of PVB as well as the influence of PVB on modulation of the stress response, postoperative pulmonary function and neurocognitive outcome. Study completion is expected in early 2004.

References:

1. Furrer M: *Eur J Cardiothorac Surg* 1977; 12:82-7.
2. Asamura H: *Respirology* 1999; 4:9-17.

Mean Cumulative Morphine Dose

