Ultrasound Visualization vs. Electrical Nerve Stimulation for Interscalene and Axillary Nerve Block in Upper Extremity Surgery: A Prospective Randomized Trial (Poster)

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Ultrasound Visualization vs. Electrical Nerve Stimulation for Interscalene and Axillary Nerve Block in Upper Extremity Surgery: A Prospective Randomized Trial

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Introduction

Ultrasound can facilitate peripheral nerve blockade by providing visualization of nerves, surrounding structures, and the distribution of injected local anesthetic. Avoidance of electrical nerve stimulation and visualization of internal anatomy suggest that nerve blocks performed with ultrasound guidance (US) may require less time to perform and be associated with an improved patient experience. Provided that success rates are equivalent to those utilizing traditional nerve stimulation (NS), US may confer a distinct advantage for patient and provider. This randomized prospective trial compares US vs. NS with respect to block success rate, time for block completion, and patient comfort.

Methods

All patients over 18 years of age presenting for elective unilateral upper extremity surgery under isolated interscalene or axillary nerve block were screened. Patients with preexisting peripheral neuropathy, coagulopathy, local anesthetic allergy, or infection were excluded. After written informed consent was obtained, patients were randomized (1:1) to either US or NS techniques. A standardized pre-medication was used. NS was performed using a nerve stimulator attached to a 4 cm Stimuplex (B Braun) needle using twitches at a stimulus < 0.5 milliams. US used a 13-6 MHz 25mm linear array probe and display monitor (L25e, S-Nerve, Sonosite). 40ccs of an equal mixture of 0.5% Bupivicaine/1.5% Mepivicaine with 1:200,000 of epinephrine were injected incrementally in both groups. Assessments of patient comfort were determined by the need for general anesthesia at any time during the procedure (intraoperative care team blinded to technique). Independent t tests were used to evaluate differences in mean scores between both groups.

Results

76 patients were enrolled. Overall, no statistically significant differences were seen between techniques in performance time, failure rates, block related complications, or overall patient experience (Table 1 & Table 2). However, there were statistically significant differences between groups with respect to comfort, pain, and anxiety experienced during the nerve block procedure (p=0.034, p=0.046, and p=0.027, respectively) (Table 3). Overall, patients in the NS group scored higher in pain and anxiety and lower in comfort than patients in the US group.

Discussion

Practitioners are awaiting outcome data prior to investing in new techniques. Although effectiveness and safety are the primary endpoints of any nerve block, patient experience and provider time warrant evaluation. Procedure related discomfort creates a lasting impression and may affect patients' future acceptance of regional anesthesia. Our data suggests that in comparison to NS, US is associated with less pain, anxiety, and improved patient comfort.