

Abstract: 2639

Scientific Abstracts > Regional Anesthesia

Ultrasound Gel vs Saline as Conducting Medium for Ultrasound-Guided Regional Anesthesia

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Introduction

Ultrasound-guided regional anesthesia is the standard for performing regional anesthesia procedures. Ultrasound gel is the traditional conducting medium for ultrasound-guided regional anesthesia. Components of ultrasound gel, such as propylene glycol and glycerol, have potential neurotoxic effects. Ultrasound gel may also make performance of a block or placement of a continuous catheter more difficult due to slippery features of ultrasound gel. Saline has been proposed as a potential ultrasound medium to address these concerns and has been described in ultrasound-guided vascular cannulation and regional anesthesia. This study aims to evaluate the impact of ultrasound gel versus saline for ultrasound imaging of the supraclavicular brachial plexus.

Materials and Methods

After approval by the Institutional Review Board at the Icahn School of Medicine at Mount Sinai, subjects were enrolled in this double-blinded crossover simulation trial. Subjects were anesthesiology senior residents and attending physicians who had completed ACGME requirements for regional anesthesia. Subjects were randomized into two groups and required to obtain a supraclavicular view of the brachial plexus on a healthy volunteer using ultrasound gel (group 1) or saline (group 2). All subjects were blinded to allocation using a semi-opaque sheet. Following a two week washout period, subjects were crossed over with group 1 using saline and group 2 using gel. All final images were saved and graded by two blinded experts in regional anesthesia. The primary outcome was willingness to proceed with the procedure using the saved image (yes/no) while the secondary outcomes were image quality (VAS 0-100) and time to image acquisition.

Results/Case Report

Thirty-eight subjects were enrolled in the study and 36 subjects completed data collection. No significant differences in demographics were noted between the two groups. No difference in willingness to proceed was found between the images using an ultrasound gel medium (31/36, 86.1%) versus a saline medium (29/36, 80.6%; $p=0.72$). Image quality was found to be higher in images using ultrasound gel (VAS=60.9, 95%CI 53.0-68.7) compared to those using saline (VAS=48.0, 95%CI 40.1-56.0; $p=0.001$). Log transformation of time to image acquisition was done to improve normality. No difference between time to image acquisition was noted for images using an ultrasound gel medium

(log[time]=2.09, 95%CI=1.68-2.50) compared to those using saline (log[time]=2.03, 95%CI=1.61-2.45; p=0.72).

Discussion

Ultrasound gel and saline provide adequate imaging for performing ultrasound-guided supraclavicular block, although ultrasound gel provided significantly better image quality when compared to saline. Further studies to evaluate the impact of ultrasound medium on block performance for ultrasound-guided regional anesthesia are required.

References

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Disclosures

No

Tables / Images



