Topical lidocaine 2% gel for analgesia and patient comfort during interscalene brachial plexus and axillary blocks: A noninferiority randomized controlled trial

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Background and goal of study

The interscalene (ISBP) and axillary (AX) brachial plexus blocks are common anesthetic methods for upper limb surgery. Needle insertion and manipulation during the blocks may cause substantial discomfort that can increase anxiety, fear and dissatisfaction with anesthesia care.¹ Topically applied local anesthetic gel could provide analgesia while eliminating the need for additional injections.^{2,3} The primary objective of this study was a noninferiority comparison between the analgesia achieved with topical gel to that of skin infiltration for pain upon needle insertion and injection during administration of the ISBP and AX brachial plexus blocks.

Materials and methods

After EC approval (B371201628396), 30 patients undergoing an ISBP or AX block for surgery of the upper limb were randomized into one of three groups: no anesthesia prior to nerve block, skin infiltration with 3mL lidocaine 2% 5 min prior to nerve block, or 10mL topical lidocaine 2% gel applied to the skin surface over the interscalene space 5 min prior to nerve block. Primary outcome variables were Visual Analogue Scale (VAS) pain scores during needle insertion and injection. To help clarify the role of patient discomfort on pain ratings, fearfulness on a 5-point Likert scale (from 1 no fear to 5 very fearful) and global discomfort assessed as Verbal Rating Scale (VRS) scores (from 0 more comfortable / less painful than expected to 10 less comfortable / more painful than expected) were also evaluated.

Results and Discussion

Topical lidocaine 2% gel was found to be noninferior to lidocaine infiltration in improving pain during needle insertion and injection of the ISBP and AX blocks. Fearfulness significantly increased needle insertion VAS (5.6 ± 2.0 , 95% CI 1.5 – 9.7, adjusted $p = 0.01$).

Conclusion

Analgesia conferred by application of lidocaine gel was noninferior to that of infiltration with lidocaine 2% for pain during needle insertion and injection of the ISBP and AX blocks. Lidocaine gel does not require the extra needle insertion and injection that can add to patient discomfort and can increase the risk for intraneural or intravascular injection. Moreover, when applied topically, gel containing local anesthetic may be time-saving as the gel can also serve as an ultrasound acoustic coupling medium. Thus sterile lidocaine 2% gel may confer adequate analgesia and ultrasound images for the ISBP and AX block procedures, while eliminating the need for additional injections and time required to apply more sterile gel.

Table. Pain on puncture, pain on injection and global patient comfort during ISB and AXB

	Control (n = 10)	Lidocaine infiltration (n = 10)	Lidocaine gel (n = 10)	p-value
Pain on puncture (VAS)	17 ± 14	15 ± 14	23 ± 13	ns
Pain on injection (VAS)	25 ± 21	24 ± 18	19 ± 15	ns
Global patient comfort ^a	2 ± 2	2 ± 1	1 ± 2	ns
Anticipation of fear ^b	3 ± 1	1 ± 1	2 ± 1	0.128

Data are mean ± standard deviation for continuous variables.

^a Global patient comfort during block from 0 (very much less) to 10 (very much more) than expected.

^b Anticipation of fear from 1 (no fear) to 5 (very fearful).

1. J Clin Anesth.2007;19(1):67–74.
2. Ann Plast Surg. 1995;35(6):576–9.
3. Ann Emerg Med. 2005;46(4):343–51.