
Abstract:

BACKGROUND: Peripheral intravenous (PIV) catheter insertion is a frequent, painful procedure that is often performed with little or no anesthesia. Current approaches that minimize pain for PIV catheter insertion have several limitations: significant delay for onset of anesthesia, inadequate anesthesia, infectious disease exposure risk from needlestick injuries, and patients’ needle phobia.

OBJECTIVE: Comparison of the anesthetic effectiveness of J-Tip needle-free jet injection of 1% buffered lidocaine to the anesthetic effectiveness of topical 4% ELA-Max for PIV catheter insertion.

METHODS: A prospective, block-randomized, controlled trial comparing J-Tip jet injection of 1% buffered lidocaine to a 30-minute application of 4% ELA-Max for topical anesthesia in children 8 to 15 years old presenting to a tertiary care pediatric emergency department for PIV catheter insertion. All subjects recorded self-reported visual analog scale (VAS) scores for pain at time of enrollment and pain felt following PIV catheter insertion. Jet injection subjects also recorded pain of jet injection. Subjects were videotaped during jet injection and PIV
Jet injection of lidocaine | 2

RESULTS: Of the 70 children enrolled, 35 were randomized to the J-Tip jet injection group and 35 to the ELA-Max group. Patient-recorded enrollment VAS scores for pain were similar between groups (P = 0.74). Patient-recorded VAS scores were significantly different between groups immediately after PIV catheter insertion (17.3 for J-Tip jet injection vs 44.6 for ELA-Max, P < 0.001). Blinded reviewer assessed VAS scores for pain after PIV catheter insertion demonstrated a similar trend, but the comparison was not statistically significant (21.7 for J-Tip jet injection vs 31.9 ELA-Max, P = 0.23).

CONCLUSION: J-Tip jet injection of 1% buffered lidocaine provided greater anesthesia than a 30-minute application of ELA-Max according to patient self-assessment of pain for children aged 8 to 15 years undergoing PIV catheter insertion.

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following PIV catheter insertion. Jet injection subjects also recorded pain of jet injection. Subjects were videotaped during jet injection and PIV catheter insertion. Videotapes were reviewed by a single blinded reviewer for observer-reported VAS pain scores for jet injection and PIV catheter insertion. RESULTS: Of the 70 children enrolled, 35 were randomized to the J-Tip jet injection group and 35 to the ELA-Max group. Patient-recorded enrollment VAS scores for pain were similar between groups (P = 0.74). Patient-recorded VAS scores were significantly different between groups immediately after PIV catheter insertion (17.3 for J-Tip jet injection vs 44.6 for ELA-Max, P < 0.001). Blinded reviewer assessed VAS scores for pain after PIV catheter insertion demonstrated a similar trend, but the comparison was not statistically significant (21.7 for J-Tip jet injection vs 31.9 ELA-Max, P = 0.23). CONCLUSION: J-Tip jet injection of 1% buffered lidocaine provided greater anesthesia than a 30-minute application of ELA-Max according to patient self-assessment of pain for children aged 8 to 15 years undergoing PIV catheter insertion.

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