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01. COMPARATIVE EFFICACY OF VIBRATION, ICE, AND TOPICAL ANESTHESIA FOR REDUCING BOTULINUM TOXIN INJECTION PAIN: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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BACKGROUND: Botulinum toxin (BoNT) injection pain is a barrier to patient satisfaction. Non-invasive analgesics like ice, vibration, and topical anesthesia are common, but their relative efficacy is unknown. We aimed to compare and rank these three interventions for BoNT injection pain via a systematic review and network meta-analysis (NMA).

METHODS: We followed PRISMA-NMA guidelines. A systematic search (inception to August 2025) was conducted in major databases, including PubMed, Scopus, and Embase, for studies of BoNT injection pain. Randomized controlled trials and comparative studies comparing ice, vibration, or topical anesthesia were included. A network meta-analysis was performed using a random-effects model to assess efficacy (pain scores), safety, and satisfaction. Interventions were ranked by P-score.
RESULTS: Twenty-two studies were included. The NMA demonstrated that ice application was the most effective analgesic, consistently ranking first (P-score = 0.8544). Topical anesthesia ranked second (P-score = 0.7542), while vibration was not significantly different from no-intervention controls. All interventions had an excellent safety profile, with pooled adverse event rates near 0%. Paradoxically, patient satisfaction was lowest for ice (19%) and highest for vibration (59%) and topical anesthesia (55%).

CONCLUSION: Ice is the most effective non-invasive intervention for reducing BoNT injection pain. However, it is associated with the lowest patient satisfaction, while less effective methods are preferred. Clinicians should tailor interventions to balance objective pain relief with patient comfort and preference.

Key Words: Botulinum Toxins, Type A; Pain; Injection Site Reaction; Anesthesia, Local.

Figure or Table: Figure 1. PRISMA chart showing selection and inclusion of studies.

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