Summary of Research on Local Anesthetic Trigger Point Injections

Local anesthetic plays a key role in trigger point therapy by blocking voltage gated sodium channels in neuronal membranes, preventing the initiation and propagation of action potentials in sensory nerve fibers within the affected muscle tissue. This results in rapid reduction of pain and muscle hyperirritability at myofascial trigger points. When agents such as lidocaine or bupivacaine are injected directly into a trigger point, pain signals can be interrupted and a local twitch response may occur, which is associated with inactivation of the trigger point.[1][2]

Multiple clinical studies and systematic reviews demonstrate that local anesthetic trigger point injections provide significant short term pain reduction and improve pain thresholds in myofascial pain syndrome. Outcomes are superior to placebo and comparable or better than treatments such as botulinum toxin A.[3][4] Practice guidelines support local anesthetic injections as a treatment option for myofascial pain, with observational data showing relief lasting up to one to four months in some patients.[5][6]

The American Society of Pain and Neuroscience guideline reports that local anesthetic injections show effectiveness similar to dry needling, saline injections, and acupuncture when the needle reaches the target muscle.[6] There is no clear evidence that one anesthetic agent is superior to another. Lower concentrations, such as 0.25 percent lidocaine, may reduce injection discomfort without reducing therapeutic effect.[6]

Recent research continues to support effectiveness in specific populations. In cancer patients with myofascial pain, a randomized controlled trial found that a single trigger point injection of 1 percent lidocaine resulted in at least 50 percent pain reduction within three days, with minimal adverse effects.[8] Studies using electromyography have shown improvement in abdominal wall trigger points after cesarean section when treated with local anesthetic infiltration.[7] A partially blinded randomized controlled trial in low back myofascial pain found that anesthetic injection can be as effective as other commonly used modalities.[9]

Typical dosing ranges from 1 to 2 mL of 1 percent lidocaine or 0.5 percent bupivacaine per site, adjusted based on muscle size and patient factors.[4] Trigger point injections with local anesthetic are considered safe when performed correctly. The most commonly reported effects are transient discomfort or minor bruising at the injection site.[8]

From a pharmaceutical perspective, the chemical stability of lidocaine mixed with dextrose has been evaluated under controlled hospital pharmacy conditions. A stability study demonstrated that lidocaine hydrochloride in 5 percent dextrose remained

chemically stable for several weeks when stored in plastic intravenous bags.[10] This study assessed chemical stability only and did not evaluate sterility, beyond use dating, or clinical injection practices.

Overall, local anesthetic trigger point injection is an evidence based, guideline supported intervention that provides rapid pain relief and functional improvement in patients with myofascial pain syndrome. Lidocaine and bupivacaine remain widely used in clinical practice.

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