Iontophoresis and Tendonitis: a Review of the Literature
By: Tiffany Allen, Ann Croghan, Nicole Keenan, Kristi Rabin, Julie Wallace

Iontophoresis is a non-invasive modality that uses electrical currents to administer a transdermal drug over minutes to hours.¹ Iontophoresis is a nontraumatic, painless method to deliver a large quantity of medicine into a localized treatment area in a cost-efficient and portable manner. Since iontophoresis delivers the drug transdermally, small amounts of the drug are absorbed into systemic circulation, thus decreasing the amount of medication that is metabolized by the liver.² Iontophoresis has shown to be beneficial for many conditions including tendinitis, bursitis, tenosynovitis, and arthritis.³⁴ Its primary musculoskeletal use is for acute or sub-acute, localized inflammation near the skin’s surface.⁴ While iontophoresis has many uses, its use for tendinitis is controversial.⁵

Precautions: Patients with a skin sensitivity, drug allergy to aspirin, allergy to metal, allergy to seafood, stomach ulcers, asthma, abraded skin, decreased sensation, diabetes, and/or pregnancy. Contraindications: cranial or orbital regions, patients with a pacemaker.

Adverse reactions: Chemical burns. Anti-inflammatory medications used with iontophoresis can only penetrate the skin up to 1.5 cm (consider this when using on someone with adipose tissue).

Iontophoresis with or without Dexamethasone in the Treatment of Acute Achilles Tendon Pain⁶
- Level 2 Evidence - Randomized, Double Blind Study
  - Effective
    - Results: Significant changes seen in experimental group compared to control group: increase in ankle plantarflexion, less pain, decrease in pain during gait and stairs, decrease in swelling, decreased pain with activity at one year.
    - Conclusion: Dexamethasone iontophoresis was more effective in reducing pain with activity, resulting in improved function, than saline iontophoresis for the treatment of acute Achilles tendinitis.

- Treatment Parameters
  - Iontophoresis: dexamethasone vs. saline for acute pain from Achilles tendon.
  - Design: 25 patients divided and received either dexamethasone or saline as well as prescribed standard exercise progression.
  - Treatment: 4 treatments, 3-4 days between sessions, during a 2-week period, duration of treatment at 20 minutes each, 3ml of dexamethasone was used.
  - Treatment with rehabilitation: both groups received the same rehabilitation program for 10 days.

Effects of Steroid Iontophoresis and Electrotherapy on Bicipital Tendonitis ⁷
- Level 2 Evidence - Randomized controlled trial
  - Implications for clinical practice:
    - Results: Reduced bicipital effusion size, pain (with rest, normal activity, and strenuous activities), improved ROM (flexion, abduction, external rotation, internal rotation) improved function, high patient satisfaction.
    - Conclusion: All parameters were statistically significant after the treatment and 1 month after treatment. Using hydrocortisone acetate for 15 minutes for a total of 15 sessions was more effective than electrotherapy for biceps tendonitis.

- Treatment Parameters
  - Both groups received:
    - 15 minutes hot pack
    - US (1.5 watts/square centimeter, continuous mode for 5 minutes)
    - Standard exercise program (pendulum, strengthening, and ROM)
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- 5 days/week
  - Hydrocortisone acetate
  - 15 minutes for 15 sessions using 3-4 mA galvanic current
  - Negative electrode placed on the anterior and majority of the superior shoulder

Treatment of Calcifying Tendinitis of the Shoulder by Acetic Acid Iontophoresis: A Double Blind Randomized Controlled Trial

- Level 2 Evidence - Individualized Randomized Control Trial
- Implications for clinical practice:
  - Recommended for treatment of calcifying tendinitis of the shoulder including tendons of the supraspinatus, infraspinatus, and teres minor in combination with other physical therapy interventions. Acetic Acid Iontophoresis provides improvement of function as described by an increase in the Shoulder Pain and Disability Index (SPADI) score, and an overall decrease in pain, but there were no significant differences in decreased pain, improved range of motion, and SPADI scores between the treatment group and the control group.

- Treatment Parameters
  - Acetic Acid Iontophoresis
  - 10 total: 3 treatments per week for 2 weeks, and one treatment per week for 4 weeks

A Systematic Review and Meta-Analysis of Clinical Trials on Physical Interventions for Lateral Epicondylalgia

- Level 1 Evidence - Systematic Review on multiple treatment options for lateral epicondylalgia
- Not Effective:
  - Nirch et al found there was a reduction in pain in the short term, however there was no difference between the groups at one month. Used a dexamethasone solution. Runeson and Haker found there were no long-term differences between groups at three and six months after treatment. Used a dexamethasone solution. Grossi et al found support to use iontophoresis. There was an improvement in self-reported functional impairments. Used a NSAID solution.
  - Summary concluded by systematic review that there is no support for the use of corticosteroid iontophoresis for lateral epicondylalgia and there is contradictory evidence on the use of NSAID iontophoresis for lateral epicondylalgia

- Implications for Clinical Treatment:
  - The use of iontophoresis should not be used for the treatment of lateral epicondylalgia. No significant long-term effects have been found; however, iontophoresis may be effective at reducing pain initially.

- Treatment Parameters
  - Two studies utilized corticosteroid solution; one study utilized NSAID solution
  - Runeson and Haker—Treated 10 minutes; 4 treatments; over the course of a week
  - Nirch—Treated 40 mA-minutes; 6 treatments; over the course of 15 days
  - Grossi—Treated for ten treatment times over the course of two weeks.
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References:


