



3-2019

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Jensen Aubry

Western Michigan University, jensen.a.aubry@wmich.edu

Ashley Ott

Western Michigan University, ashley.m.ott@wmich.edu

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Aubry, Jensen and Ott, Ashley, "Effectiveness of Ultrasound (US) on Adults with Lateral Epicondylitis (LE)" (2019). *Occupational Therapy Graduate Student Evidenced-Based Research Reviews*. 37.

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Effectiveness of Ultrasound (US) on Adults With Lateral Epicondylitis (LE)

Jensen Aubry & Ashley Ott

Background:

-Individuals diagnosed with LE often present with increased pain and decreased functioning in daily activities. LE, commonly referred to as “tennis elbow”, which results from stress and pain to the lateral epicondyle or extensor carpi radialis brevis (ECRB). This can develop from a single incident, injury or trauma, which results in pain with gripping and lifting (Leadbetter, 2016).

-Ultrasound (US) utilizes wave production to cause thermal or nonthermal sound waves to stimulate tissue by increasing collagen extensibility and enabling the inflammatory process (Knight & Draper, 2013).

-Areas being treated by US require different depths; a 1.0 MHz sound head reaches a depth of 3-5 cm and a 3.0 MHz sound head reaches a depth of 1-2 cm (Ledbetter, 2016).



Figure 1: (EMS Tennis Elbow, 2005).

1 Ask: Research Question

Is the use of Ultrasound an effective treatment for adults with Lateral Epicondylitis?

2a Acquire: Search Terms

Patient/Client Group: Adults with LE

Intervention (or Assessment): Thermal US, non-thermal pulsed US

Comparison: Placebo, rest, stretching, other modalities (shock wave, E-Stim), counterforce brace

Outcome(s): Effectiveness compared to other treatment or placebo, significance, pain, ADL's, functionality, grip strength

2b Acquire: Selected Articles

D'Vaz et al. (2006): Randomized controlled trial conducted in the United Kingdom. Compared the effects on grip strength and pain on patients diagnosed with LE using pulsed, low-intensity US (LIUS) to placebo group.

Akin et al. (2010): Randomized prospective study conducted in Turkey. Compared the short-term effectiveness of thermal US treatment on pain, grip strength, quality of life and ADL's in patients with a LE diagnosis to placebo treatment.

3a Appraise: Study Quality

D'Vaz et al. (2006): Level I. n=48; randomly assigned to active group (n=25) with US at 1.5 MHz, 30 mW/cm² for 20 minutes, daily for 12 weeks, or placebo group (n=23). Double blind study. Outcomes assessed at 12 weeks after baseline. Limitations: self-administration, depth of US and only used self-report as a measure. No indication the US was calibrated and only reported the US appeared to be fully functioning. Thirty participants in each group were needed for 80% power; however the active group had 25 and the placebo group has 23.

Akin et al. (2010): Level II. n=60; 40 females, 20 males were randomly assigned to the US group (n=30) or placebo group (n=30). US parameters were used were 1MHz, 1.5W/cm² for 5 minutes over three weeks for a total of 15 sessions. Single blind study; one researcher was blind to analyses, and one was blind to treatment. An epicondylitis bandage was applied to all patients during three week treatment, which is considered a confounding variable. Calibration of US was not reported.

3b Appraise: Study Results

D'Vaz et al. (2006): After 12 weeks pain improved in all but 6 subjects. Active group had a median reduction in pain by 80% from baseline compared with a 63% reduction from baseline in placebo group. Visual analogue pain scale (VAS) was the main outcome measure used (p=.60). Patient-Rated Forearm Evaluation Questionnaire (PRFEQ) was another outcome measure. There was no change in pain scores (p=.99) or functional impairment scores (p=.40).

Akin et al. (2010): After three weeks of treatment, results were analyzed and compared to the baseline. The outcome measure of pain was not statistically significant between groups, VAS rest pain (p=.654) and VAS movement pain (p=.318). The change in hand grip strength was statistically significant after three weeks of treatment for both groups (p<.05); however, the averages were similar between groups (p=.310). Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH) scores were statistically significant after 3 weeks in both groups (p<.05), and averages were similar between groups (p=.861). Satisfaction levels were greater with US after 3 weeks (p<.001). Quality of life was measured using the 36-item Short Form Survey (SF-36). The US group showed statistically significant change after 3 weeks in social function and emotional situation (p<.05). General social function averages between groups were similar (p=.079), and general physical function averages were significantly higher in US group (p=.035).

4 Apply: Conclusions for Practice

For LE, the ECRB is a superficial muscle, and would require use of a 3.0 MHz sound head with a moderate increase in heat (2-3°C) to help reduce pain, muscle spasm and increase blood flow (Knight & Draper, 2013).

Research does not support the use of US for LE. However, the methodology used was inconsistent with research identifying parameters to change tissue temperature using US (Knight & Draper, 2013).

References:

- Akin, C., Öken, Z., & Füsün Köseoğlu, B. (2010). Short-term effectiveness of ultrasound treatment in patients with lateral epicondylitis: randomized, single-blind, placebo-controlled, prospective study. *Official Journal of the Turkish League Against Rheumatism*, 25(2), 50-55. doi:10.5152/tjr.2010.01
- D'Vaz, A.P., Ostor, A.J.K., Speed, C.A., Jenner, J.R., M. Bradley, Prevost, A.T., Hazleman, B.L. (2006). Pulsed low-intensity ultrasound therapy for chronic lateral epicondylitis: a randomized controlled trial. *Rheumatology*, 45(5), 566-570. doi:10.1093/rheumatology/kei210
- Knight, K., & Draper, D. (2013). *Therapeutic Ultrasound. Therapeutic Modalities: The art and science*. (2nd ed., pp 252-282). Baltimore, MD: Lippincott Williams & Wilkins
- Leadbetter, J. (2016). Epicondylosis. In R.J. Saunders, R.P. Astifids, S.L. Burke, J.P. Higgins, M.A. McClinton (Eds.), *Hand and upper extremity rehabilitation a practical guide* (pp. 291-307). St. Louis, MO: Elsevier.

Research does not support the use of US to treat LE. However, research uses inconsistent parameters that are not supported by previous literature.

