**Kucuksen S, Yilmaz H, et al. Muscle energy technique versus corticosteroid injection for management of chronic lateral epicondylitis: randomized controlled trial with 1-year follow-up. Arch Phys Med Rehabil. 2013;94(11);2068-74.**

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Design: randomized clinical trial

Purpose of study: to compare the effectiveness of muscle energy technique with injection of steroid in patients with chronic tennis elbow

Population/sample size/setting:

* 82 patients (45 women, 37 men, mean age 45) treated for chronic lateral epicondylitis at a university physical medicine department in Turkey
* Eligibility requirements were at least 3 months of elbow pain of severity 50 or more on a 100 point scale, located on or near the lateral epicondyle, elicited with at least 2 of 3 provocation tests (resisted wrist extension with the elbow extended, stretching of the forearm extensor muscles, and gripping), age between 18 and 70, and willingness to comply with the study protocol
* Exclusion criteria were previous physical therapy or steroid injection in the past 6 months, neck or shoulder problems likely to cause or maintain the elbow complaints, posterior interosseous nerve compression, congenital or acquired elbow deformities, systemic musculoskeletal or neurological disorders, pregnancy, and breast feeding

Interventions:

* Randomization was to one of two groups: muscle energy technique (MET, n=41) or corticosteroid injection (CSI, n=41)
* MET was done twice per week for 4 weeks, and consisted of the therapist stabilizing the patient’s elbow with one hand, supinating the patient’s hand with the other hand, and having the patient perform an isometric effort of forearm pronation against the therapist’s counterforce for 5 seconds; this was repeated 3 to 5 times, with the therapist taking the patient’s forearm further into supination each time
* CSI was done with I ml triamcinolone plus 1 ml of 1% lidocaine injected 1 cm distal to the lateral epicondyle and directed to the point of maximum tenderness; the patients were advised to avoid pain-provoking activities for 2 weeks after the injection

Outcomes:

* Followup was done at 6 weeks, 26 weeks, and 52 weeks
* The primary outcome was pain-free grip strength (PFGS) measured by a dynamometer with the patient supine and the elbow in relaxed extension and pronation, with the patient instructed to squeeze and to stop when pain was first felt; the dynamometer also measured maximum grip strength on the unaffected side
	+ PFGS was reported for each patient as the percentage of the unaffected side grip strength that the affected side was able to grip without pain
* Secondary outcomes included pain VAS on a 0-10 point scale during the hand-gripping task and the Disabilities of Arm, Shoulder, and Hand (DASH) questionnaire, where 0 means no disability and 100 is maximum disability
* The comparison of MET and CSI differed with respect to PFGS at different followup times
	+ At baseline, MET and CSI both had PFGS with the affected side showing less than half the strength of the unaffected side (40.46% for MET, 44.0% for CSI)
	+ At 6 weeks, PFGS was less for MET (60.95%) than for CSI (72.48%)
	+ At 26 weeks, MET had more PFGS (68.9%) than CSI (61.45%)\
	+ At 52 weeks, MET had more PFGS (75.08%) than CSI (62.24%)
	+ Thus, MET led to better PFGS at each followup assessment, while CSI led to an early improvement followed by a later worsening of PFGS
* For the secondary outcomes, a similar general pattern of an early advantage of CSI over MET was followed by a later advantage of MET over CSI; however, for the DASH, the CSI and MET groups did not differ significantly at any of the followup times
* There were no adverse events in the MET group, and there were 3 adverse events in the CSI group: 1 patient had injection site pain lasting 5 days, 2 patients had a loss of skin pigment, and 1 patient had subcutaneous atrophy

Authors’ conclusions:

* The results of this study are similar to those reported in many other studies of CSI: there is an early improvement which is not maintained, and is often reversed as time goes by
* MET is a safe intervention which, unlike CSI, can be repeated without adverse events
* A limitation of the study is the lack of a control group not receiving MET or CSI; also, range of motion was not measured as an outcome

Comments:

* The study does appear to repeat a pattern of response to CSI seen in other settings when it is being used to treat tennis elbow: an early therapeutic response followed by a later reversal of response, wherein it appears to be comparatively detrimental at intermediate and long term followup times
* The PFGS of the affected side never quite recovers to 100% of the unaffected side
	+ At 12 months, the PFGS of the MET group was 75.08% of the unaffected side
	+ In the MET group, 80.5% of the patients were affected on the dominant side; 75.6% of the CSI group was affected on the dominant side
	+ The fact that the best PFGS at the end of 12 months was only 75%, when most of the comparisons are of the affected dominant side to the unaffected nondominant side, would suggest that the duration of symptomatic difficulties with lateral epicondylitis is greater than 12 months, often cited as the duration of the natural history of the condition
* The data on VAS scores is problematic; the methods state that the scores were obtained during the grip task at each evaluation
	+ The patients were supposedly instructed to grip the dynamometer until pain was first felt, and then to stop
	+ The VAS for each evaluation should therefore have been on the order of 1 or perhaps 2 on a 10 point scale
	+ Instead, the pain at baseline was above 7 for each group, and for the 12 month followup measurements, was 3.28 for MET and 4.95 for CSI
	+ The VAS scores are therefore suspect at each evaluation
* There is no explicit statement that the grip strengths were done by an evaluator who was unaware of the intervention received by the patient, making blinding of outcome assessment an unclear point
* It appears that the CSI group did not have any PT, and that the MET group also did not have any PT or home exercise following the interventions which were done at the start of the study; this is a departure from what is likely to be practiced in usual circumstances
* Although seriously weak in some respects, the study is adequate for evidence that steroid injections have short term benefits followed by later deterioration, and for evidence that muscle energy is safe and more effective in improving grip strength than steroid injections

Assessment: with respect to the conclusion that steroid injection of the lateral epicondyle leads to a short-term improvement which is reversed at the intermediate and long term: adequate

With respect to the conclusion that muscle energy is superior to corticosteroid injection in improving grip strength in lateral epicondylitis : adequate

With respect to the conclusion that muscle energy is superior to no treatment for lateral epicondylitis: inadequate