**Coombes BK, Bisset L, Vicenzino B. Efficacy and safety of corticosteroid injections and other injections for management of tendinopathy: a systematic review of randomised controlled trials. Lancet 2010;376(20):1751-67.**

PMID: 20970844

Design: Meta-analysis of randomized clinical trials

Purpose of study: to assess the effectiveness of steroid injections and other injections in the setting of tendinopathy of the shoulder, elbow, knee, and ankle

PICOS:

* Patient population: Tendinopathy of the rotator cuff, elbow, knee, and ankle
* Intervention: one or more peritendinous injection of any active medication
* Comparison: Injection with placebo (saline or local anesthetic), no intervention (wait and see), NSAIDS, physiotherapy, electrotherapy, or orthotic devices
	+ Excluded were studies of intra-muscular or intra-articular injections, because pathological changes are considered to reside in the tendon
* Outcomes: Pain, function, and patient-related overall improvement
	+ Short-term was defined as up to 12 weeks
	+ Intermediate term was defined as up to 26 weeks
	+ Long term was defined as 1 year or longer
* Study types: Randomized controlled trials only

Study selection:

* Databases included MEDLINE, EMBASE, CENTRAL, CINAHL, and the Physiotherapy Evidence Database through March 2010
* Quality was derived from the PEDro scale, which is similar to the Cochrane scale for risk of bias, with two added items: consistency of timing of outcome measurements and documentation of adverse effects
* If the study had a score of less than 50% in the modified PEDro scale, it was not further considered for evidence of the effect of injections
* If the results from the studies could not be statistically pooled, a qualitative system of strength of evidence was defined
	+ Strong evidence was consistent findings between many high-quality RCTs
	+ Moderate quality was one high-quality RCT
	+ Conflicting evidence was inconsistent findings between many RCTs
	+ No evidence was the absence of any RCT on the intervention
* When data could be pooled, the effect size was reported in standardized mean differences (SMD), where the differences in groups were how many standard deviations (SD) separated the two groups: following general conventions, SMD of less than 0.5 SD is “small,” SMD between 0.5 and 0.8 SD is “medium,” and SMD greater than 0.8 SD is “large”

Results:

* For all tendinopathies, 41 studies were included in the review; 12 trials were for patients with lateral epicondylalgia, from which 18 analyses could be done on a total of 1171 patients
* For lateral epicondylalgia, there was strong evidence for benefit of steroid injections in the short term
	+ Pooled data from 2 studies of steroid injection versus no injection showed a pooled “relative risk” of overall improvement of 3.47 (95% confidence interval of 2.11 to 5.69) in favor of steroid in the short term, but a long term detriment with a RR of 0.79 (95% CI from 0.69 to 0.90) compared to no injection
	+ Pooled data from three studies comparing steroid injection with physical therapy showed a similar pattern of early benefit with later detriment
		- The RR for overall improvement was 2.37 (95% CI from 1.75 to 3.21) in favor of steroid in the short term, but the RR in the long term was 0.76 (95% CI from 0.67 to 0.85) in favor of PT
	+ Standardized mean differences (rather than relative risks) were computed for functional outcomes, and early benefits were followed by later reversal, as was the case with global overall improvement
		- For steroid injection versus no injection, the SMD in the short term was “large” in favor of steroid (SMD 1.50, 95% CI 1.22 to 1.77); in the long term, the SMD was small in favor of no injection (0.37, 95% CI 0.06 to 0.57)
		- For steroid injection versus PT, the early SMD in favor of steroid was large (1.29, 95% CI 1.03 to 1.55), but the long term SMD was moderate in favor of PT (0.57, 95% CI 0.21 to 0.82)

Authors’ conclusions:

* There is strong evidence that steroid injection provides short term benefit for common tendinopathies
* However, there is also strong evidence that steroid injections are worse than other treatment options in the intermediate and long term results
* This poses a dilemma because tendinopathy does not have an inflammatory pathogenesis; other mechanisms involving collagen and extracellular matrix molecules could explain the biology of these tendinopathies

Comments:

* Pain scores followed a pattern similar to function and global improvement
* Tendinopathies other than tennis elbow (such as for the shoulder) also showed early benefit followed by later reversal for steroid injection compared to either no injection or PT
* A more recent study (Coombes 2013) had a long term followup of steroid injection versus placebo injection, and also showed that early global improvement was reversed by 26 weeks and remained less beneficial than placebo at one year

Assessment: Adequate meta-analysis of randomized trials supporting strong evidence that in the setting of lateral epicondylitis, the effects of corticosteroid injections on pain and function are more favorable than placebo in the first four weeks, but these benefits are reversed by six months, and are detrimental compared to placebo injections in the intermediate and long term.

Reference:

Coombes BK, Bisset L, et al. Effect of Corticosteroid Injection, Physiotherapy, or Both on Clinical Outcomes in Patients With Unilateral Lateral Epicondylalgia: A Randomized Controlled Trial. JAMA. 2013;309(5):461-469.