

**Min KS, St. Pierre P, et al. A double-blind randomized controlled trial comparing the effects of subacromial injection with corticosteroid versus NSAID in patients with shoulder impingement syndrome. J Shoulder Elbow Surg 2013;22:595-601.**

Design: randomized clinical trial

Research question: Is an injectable NSAID (ketorolac) comparable to a corticosteroid in patients with shoulder impingement syndrome without rotator cuff tears?

Population/sample size/setting:

- 32 patients (25 men, 7 women, mean age 39) treated for symptomatic shoulder impingement at an orthopedic service in Tacoma, WA
- Eligibility criteria were shoulder pain with passive and/or active abduction in the 60° to 120° arc of motion, positive Neer's and Hawkins tests, and diagnosis of subacromial bursitis based on tenderness to palpation anterior/lateral to the acromion
- Exclusion criteria were age under 18, symptoms less than one month, previous shoulder injections in previous three months, MRI evidence or history of rotator cuff tear, systemic inflammatory condition, shoulder osteoarthritis, pending litigation or work-related claims, local infection, adhesive capsulitis, and evidence of shoulder instability

Main outcome measures:

- The original study cohort had 48 patients, but 10 were lost to followup, one withdrew consent, and 5 were later found by MRI to have rotator cuff tears
- All patients had an injection into the subacromial space with acromion and coracoid process as landmarks
- Randomization of the analyzed 32 patients was to NSAID (n=17) or steroid (n=15)
  - o NSAID was ketorolac 60 mg with 6 cc of 1% lidocaine
  - o Steroid was 40 mg triamcinolone with 6 cc of 1% lidocaine
- Main outcome measure was the UCLA score at the 4 week followup visit
  - o Pain VAS and shoulder ROM were secondary outcomes
- Both groups improved their total UCLA scores (both scores had an average of 17 at baseline)
  - o The NSAID group had greater improvement (mean of 7.15 points) than the steroid group (mean of 2.13 points)
  - o The pain, function, and active forward flexion subscales, while favoring the NSAID group, did not reach statistical significance

- The forward flexion strength subscale of the UCLA score was significantly higher in the NSAID group, as was patient satisfaction with treatment

Authors' conclusions:

- NSAID injection had better efficacy than steroid injections as measured by the UCLA score at the four week followup, perhaps due to a greater anti-inflammatory action of ketorolac
- The study had a high dropout rate, but the losses were about equal between groups
- Some patients who did not have an MRI may have had rotator cuff tears
- The home physical therapy regimen was not closely monitored or standardized

Comments:

- The high attrition rate was not explained, but of the 10 patients lost to followup, 7 were in the steroid group and 3 in the NSAID group
- While the conclusion of superior efficacy of NSAID over steroid is not persuasively shown, there is evidence that ketorolac injection is at least equal to triamcinolone injection
- Special care was taken to preserve blinding of participants and physicians, which controls an important source of bias
- The enrollment process may not have been well-coordinated; although rotator cuff tear was an exclusionary criterion, it went undetected in 5 participants and about a fifth of the study cohort did not have an MRI
- However, the method of clinical diagnosis may reflect what is commonly done in everyday practice in many places
- The authors note that repeated steroid injections have been reported to lead to failure of rotator cuff repair (Blair et al 1986), but concede that definitive studies of injected NSAIDs are lacking; nevertheless, it is rational to consider the potential safety advantages of alternatives to steroids when shoulder injections are being considered

Assessment: Adequate for some evidence that subacromial injection of 60 mg of ketorolac is at least as effective as injection of 40 mg of triamcinolone in the short term treatment of subacromial impingement syndrome

Reference:

Blair B, Rokito AS, et al. Efficacy of Injections of Corticosteroids for Subacromial Impingement Syndrome. *JBS Am* 1986;78A:1685-1689.