Does injection of steroids and lidocaine in the shoulder relieve bursitis?

EVIDENCE-BASED ANSWER

Subacromial steroid injection may provide a small, short-term benefit compared with placebo. The short-term effectiveness of steroid injection compared with nonsteroidal anti-inflammatory agents (NSAIDs) remains unclear.

Steroid injections are better than physiotherapy alone in the short term. However, injection does not appear to provide any meaningful long-term benefit compared with other therapies (strength of recommendation: **B**). Data are insufficient to make recommendations regarding the proper timing of injection in the sequence of other treatments. Side effects of steroid injection, such as steroid flare and infection, are rare.

EVIDENCE SUMMARY

A Cochrane Review of corticosteroid injections for shoulder pain found 7 randomized controlled trials comparing subacromial steroid injections with placebo.[1] The placebos were either injectable anesthetics alone or injectable anesthetics combined with oral placebo tablets. Six of the 7 studies used the anterolateral approach to inject under the acromion.

All studies used a clinical exam for diagnosis that showed pain with range of motion (especially abduction) or pain that was consistent with impingement syndrome. Most of the follow-up times were short, typically 4 to 12 weeks, and the longest study was 33 weeks. Meta-analyses often report the effect size using standard mean difference (SMD). A rule of thumb for interpretation of SMD is a value of 0.2 indicates a small effect, a value of 0.5 indicates a medium effect, and a value of 0.8 or larger indicates a large effect. If the 95% confidence interval [CI] does not include zero, then the SMD is statistically significant at the 5% level ($P<.05$).[2]

Two of the studies comparing steroid injection with placebo were methodologically suitable for meta-analysis; these studies showed that steroids provided a mild, short-term (4-week) benefit with respect to pain (SMD=0.83; 95% CI, 0.39–1.26), function (SMD=0.63; 95% CI, 0.20–1.06), and abductive range of motion (SMD=0.82; 95% CI, 0.39–1.25).[3,4]

Results of the remaining, less rigorous trials were conflicting and inconclusive. The reviewers also found 3 randomized controlled trials comparing subacromial steroid injection with oral NSAIDs. The pooled results of these trials, encompassing 120 patients, found no differences

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What are Clinical Inquiries?

Clinical Inquiries answer real questions that family physicians submit to the Family Practice Inquiries Network (FPIN), a national, not-for-profit consortium of family practice departments, residency programs, academic health sciences libraries, primary care practice-based research networks, and other specialists.

Questions chosen for Clinical Inquiries are those that family physicians vote as most important through a web-based voting system.

Answers are developed by a specific method:

- FPIN medical librarians conduct systematic and standardized literature searches in collaboration with an FPIN clinician or clinicians.
- FPIN clinician authors select the research articles to include, critically appraise the research evidence, review the authoritative sources, and write the answers.
- Each Clinical Inquiry is reviewed by 4 or more peers and editors before publication in *JFP*.
- FPIN medical librarians coauthor Type I Clinical Inquiries that have required a systematic search.
- Finally, a practicing family physician writes an accompanying commentary.

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in these 3 outcomes at 4 or 6 weeks. The review of an additional trial of 50 patients comparing subacromial steroid injection plus simultaneous oral NSAIDs with oral NSAIDs alone found no differences at 4 weeks. All 11 studies had small sample sizes, and suffered from variable methodological quality and heterogeneous results.

The reviewers concluded that steroids are probably better than placebo but provide little or no benefit in addition to NSAIDs, and that evidence is insufficient to guide treatment. Likewise, a Cochrane Review of multiple interventions for shoulder pain also found "little evidence to support or refute the efficacy of common interventions" and highlighted the need for new, well-designed trials.[5]

Another Cochrane Review examined 4 randomized controlled trials comparing physiotherapy interventions for shoulder pain.[6] They found that steroid injections may be superior to physiotherapy for rotator cuff disease, but the type of physiotherapy and injection sites were not consistent across the studies, making creation of summary estimates inappropriate. The individual studies showed significant short-term benefits (3–7 weeks) of steroid injection over physiotherapy; however, long-term (6–52 weeks) benefits ranged from some benefit to no difference. These studies were consistent regarding age (mean age=53–55 years, SD ± 13–14 years) and complications reported, with the only side effect being postinjection soreness.

Hay et al[7] conducted a multicenter, primary care–based randomized controlled trial with more than 200 patients, which was published too recently for inclusion in the Cochrane Review. They found no statistical difference in improvement between steroid injection without physiotherapy and physiotherapy alone at 6 weeks.

In 1996, van der Heijden et al[8] systematically reviewed randomized clinical trials of steroid injections for shoulder disorders, including rotator cuff disease, adhesive capsulitis, rheumatoid conditions, and periarthritis. They screened more than 200 articles from searches in Medline

Subacromial steroid injections are better than physiotherapy alone in the short term

(1966–1995) and EMBASE (1984–1995) and found 16 articles that met qualifying conditions for further review. Of these, 3 were methodologically adequate for final review. None of these 3 studies provided evidence showing the efficacy of steroid injections. The results of the major trials reviewed can be found in the **Table**.

RECOMMENDATIONS FROM OTHERS

The American Academy of Orthopaedic Surgeons' clinical guideline for shoulder pain[9] recommends the following for rotator cuff disease: avoidance of irritating activity; anti-inflammatory medications if tolerated; exercises to recover and maintain passive range of motion; exercises to strengthen the rotator cuff once acute symptoms abated. If these are unsuccessful over several weeks, they recommend considering subacromial injection of local anesthetic and a short-acting corticosteroid. They gave their recommendation a "B" rating (some evidence exists to suggest benefit).

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TABLE

Major placebo-controlled trials of injectable steroids for shoulder pain

Steroid (n)	Comparison	Follow-up arms (n)	Reported results	Conclusions
Methylprednisolone 1% lignocaine (28)	1% lignocaine (28)	12 wks	2 wks: insignificant improvement in steroid arm 2, 4, 6, 12 wks: no difference in pain, range of motion; all *P*>.05	No significant advantage of subacromial methyl prednisolone over lignocaine[10]
Triamcinolone, 0.5% lignocaine, placebo tabs (20)	C1: diclofenac, lignocaine (20) C2: placebo tabs, lignocaine (20)	4 wks	4 wks: steroid and C1 showed significant benefit over C2 for pain and range of motion (*P*<.05) Steroid vs C1: no difference (*P*=.0268)	Triamcinolone and diclofenac are equivalent, and superior to placebo[3]
S1: triamcinolone, 1% lidocaine, naproxen (25) S2: triamcinolone, 1% lidocaine, placebo (25)	C1: 1% lidocaine, naproxen (25) C2: 1% lidocaine, placebo (25)	4 wks	S1 superior to S2, C1, C2 S2 superior to C1, C2 For pain and clinical index at 2 and 4 wks, *P*<.05	Triamcinolone and naproxen superior to placebo. More severe cases see most benefit[4]
Triamcinolone, placebo tabs (15); reinjection at 3 wks if not better	Saline injection, indomethacin (15); reinjection at 3 wks if not better	6 wks	Pain and global scores improved in both groups (*P*<0.05), but no difference between them (*P*>.05)	No difference between indomethacin and triamcinolone injection[11]
S1: methylprednisolone, lidocaine, placebo tabs (12) S2: methylprednisolone, NSAID (12)	C1: acupuncture (12) C2: ultrasound (12) C3: placebo tab, placebo U/S (12)	4 wks	All patients improved. No differences in pain scores or abduction measurements at 2 or 4 wks (*P*=n/a)	Painful stiff shoulder may be self-limiting condition and beneficial effect may be natural recovery[12]
Methylprednisolone, 1% lidocaine (104)	Physiotherapy (103)	6 mos, option of other therapies given at 6 weeks	No differences in disability scores 6 wks: mean difference= –.05 (95% CI, –.02 to 3.0) 6 mos: mean difference= 1.4 (95% CI, –0.2 to 3.0) (7)	Physiotherapy and steroid injection were of similar short- and long-term effectiveness for treating new episodes of unilateral shoulder pain
Triamcinolone, 1% lidocaine (19)	1% lidocaine (21)	Mean: 33 wk; range: 12–52 wk	Steroid: significant improvements of pain (*P*<.005) and range of motion (*P*<.005) vs control. No difference in activities of daily living seen (13)	Subacromial injection of steroids is effective for short-term therapy of impingement syndrome

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CLINICAL COMMENTARY:

Consider injection with anesthetic and steroid for rotator cuff impingement

Subacromial injection is an integral component of the treatment armamentarium for certain types of shoulder pathology. Diagnostically, injection of a local anesthetic such as lidocaine can help differentiate true weakness caused by a full-thickness rotator cuff tear from inhibition due to inflammation and impingement pain. Strongly consider subacromial injection with both a local anesthetic and corticosteroid for patients with true rotator cuff impingement as diagnosed by positive Neer and Hawkins signs on examination.

If injection is appropriately administered, the patient should have near-immediate and significant reduction of impingement symptoms. They may regain motion sooner and advance quicker through their initial therapy program.

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What treatments are safe and effective for mild to moderate hypertension in pregnancy?

EVIDENCE-BASED ANSWER

There is considerable debate concerning the treatment of mild to moderate essential hypertension during pregnancy. Evidence suggests that because of the potential risk of fetal intrauterine growth restriction, treatment of hypertension should be delayed until maternal blood pressure reaches 150–160 mm Hg systolic or 100–110 mm Hg diastolic, as long as the mother has no preexisting end organ damage.

Methyldopa has been the drug of choice for oral treatment, as it is the only medication to have any extended follow-up study. However, a recent meta-analysis raised the possibility of increased fetal mortality (strength of recommendation [SOR]: **A**, based on systematic review of randomized controlled trials).

Labetalol is an effective alternative, but concerns remain that treatment with any beta-blocker increases the risk that infants will be small for gestational age (SGA) (SOR: **B**, based on small randomized controlled trials with inconsistent results).

There is limited evidence that calcium channel blockers and diuretics are safe alternatives, although evidence is insufficient to prove a clear benefit (SOR: **B**, based on limited randomized controlled trials). Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs), due to similar mechanisms of action, are contraindicated in pregnancy (SOR: **B**, based on multiple case studies). No other class of antihypertensive medications is proven to be harmful in pregnancy.

EVIDENCE SUMMARY

Treatment of maternal hypertension during pregnancy is based on maternal and fetal outcomes.

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