Rotator cuff tendinosis: meta-analysis finds minimal short-term pain relief from corticosteroid injections

Corticosteroid injections are a common intervention for the symptomatic management of rotator cuff tendinosis, despite conflicting evidence for the short- and long-term benefits of treatment. A meta-analysis of 11 randomised controlled trials found people who received a corticosteroid injection had a ‘small’ to ‘medium’ reduction in pain for up to 8 weeks compared with placebo, although between 8 and 12 weeks no benefit was observed. The meta-analysis has a number of limitations, including pooled pain scores not reported for corticosteroid injections and the use of lidocaine as a placebo. The authors of the review noted that corticosteroid injections are known to cause discomfort and may accelerate tendon degeneration, although this was not assessed in this review. Experts suggest that corticosteroid injections may still be useful for some people to reduce pain levels and enable other management strategies, for example physiotherapy.

Overview and current advice

Rotator cuff tendinosis is a natural part of aging and, although some people may be asymptomatic, it is a common cause of shoulder pain. Tendinosis encompasses many commonly used terms, including impingement, rotator cuff fraying, partial thickness tears and tendinitis. The main treatment options for shoulder pain include avoiding activities that make the symptoms worse, ice packs, analgesia, anti-inflammatory drugs, physiotherapy, hydrodilatation and surgery (NHS Choices). Some people have their symptoms treated with a corticosteroid injection into the subacromial space, although the effectiveness of this treatment is debated.

A 2003 Cochrane review included 26 randomised and pseudo-randomised trials on corticosteroids for shoulder pain (median n=52 per trial). For rotator cuff disorders, corticosteroid injections were found to have a small benefit over placebo in some trials, although their benefit over non-steroidal anti-inflammatory drug (NSAID) treatment was not demonstrated. The authors of the review concluded that corticosteroid injections may be beneficial in rotator cuff disease, although their effect may be small and not well-maintained.

In 2009, a meta-analysis by Gaujoux-Viala, Dougdas and Gossec looked at corticosteroid injections for shoulder and elbow tendonitis (20 randomised controlled trials [RCTs], 1,731 participants, 618 shoulders, 1,113 elbows). Pooled analyses suggested short-term effectiveness (1–3 weeks and 4–8 weeks) of steroid injections for pain and functional disability caused by shoulder and elbow tendinosis compared with other treatments ('wait and see', physiotherapy and NSAIDs combined). At longer-term follow-up (12–24 weeks and 48 weeks), there were few differences between the groups in
pain and functional disability and, for some comparisons, steroid injections appeared less effective than other treatments.

A meta-analysis of injections for tendinopathy by Coombes, Bisset and Vicenzino⁴ published in 2010 included 13 RCTs of corticosteroid injections for rotator cuff tendinopathy (n=890). The review found the evidence for short-term benefits was conflicting. The pooled results of 3 small trials found a ‘medium’ benefit of corticosteroids on pain compared with placebo and 1 trial found a ‘large’ benefit on global improvements and function compared with tenoxicam injection. However, no differences in pain or function were seen compared with oral NSAIDs or physiotherapy. The authors also found no benefit for corticosteroid injections for intermediate- and long-term outcomes. The review concluded that any potential short-term benefits of corticosteroid injections must be balanced against long-term negative outcomes.

The meta-analysis discussed in this MEC pooled data on corticosteroid injections for rotator cuff tendinosis, including RCTs published since 2010.

**New evidence**

The meta-analysis¹ considered whether corticosteroid injections reduce pain in people with rotator cuff tendinosis over a 3 month follow-up period and whether multiple steroid injections are more effective than a single injection. Studies were included in the meta-analysis if they were RCTs comparing corticosteroid injection treatment for rotator cuff tendinosis with a placebo injection, included at least 10 adults, used a 10cm/100mm visual analogue scale (VAS) for pain as an outcome measure and followed participants for at least 1 week after injection.

Fourteen RCTs were included in the systematic review, although 3 of these studies had a Jadad score (a measure of methodological quality) of less than 3, so only 11 RCTs (n=726) were included in the meta-analysis. Three studies (n=292) used repeated injections. The average age of the participants was 54 years (range 48–58 years). Saline was used for the placebo in 2 studies and lidocaine was used in 11 studies. Three different corticosteroids were used at a range of doses: triamcinolone (7 RCTs, usual dose 40 mg [range 10–80 mg]), methylprednisolone (6 RCTs, usual dose 40 mg [range 25–80 mg]) and betamethasone (1 RCT, dose 6 mg).

The authors found that corticosteroid injections did not reduce pain intensity between weeks 8 and 12 compared with placebo injections (standard mean difference [SMD] 0.23, 95% confidence interval [CI] –0.09 to 0.56, p=0.162, 8 RCTs, n=564). A statistically significant difference in pain relief between the groups was seen between weeks 4 and 8 (SMD 0.52, 95% CI 0.27 to 0.78, p<0.001, n=691) and before 4 weeks (SMD 0.44, 95% CI 0.15 to 0.73, 8 RCTs, n=578). SMDs of 0.20–0.49 and 0.50–0.79 are considered to represent ‘small’ and ‘medium’ effects respectively, so the pain relief seen up to 8 weeks was only modest. There was no statistically significant difference between single and multiple corticosteroid injections at any time point.

The authors calculated the number needed to treat [NNT], which suggests that 5 people would need to be treated with a corticosteroid injection rather than a placebo injection for 1 person to have their pain reduced to not more than ‘mild’ (defined as a VAS score of 3.4 or less) between 4 and 8 weeks. It was not possible to calculate an NNT between 8 and 12 weeks (because there was no statistically significant difference between the groups) or before 4 weeks (because the chance of a person having ‘mild’ pain was less than 1 in 1,000).

**Commentary**

Commentary provided by Mr Jochen Fischer, Consultant Upper Limb Surgeon, Macclesfield District General Hospital, East Cheshire NHS Trust
The review and meta-analysis by Mohamadi et al. provides further evidence that subacromial corticosteroid injections provide short-term pain relief in patients with rotator cuff disease. However, there are some limitations to this review:

- In order to calculate the number needed to treat (NNT) the authors use “mild pain” as the endpoint. This excludes patients who may have experienced a large reduction in their pain scores, but who were still experiencing pain that was more than ‘mild’, which therefore potentially underestimates the effect of corticosteroid injections.
- The figures for the pooled VAS pain are only provided for the control group, but not for the corticosteroid group, making it difficult to interpret the results.
- Lidocaine injections were included in the placebo group, despite local anaesthetics being an active treatment for shoulder pain.

The authors conclude that the benefits of these injections are too limited and too short-term in nature to have a lasting impact on a long-term condition. However it is important to consider corticosteroid injections alongside the other non-pharmacological treatments for shoulder pain. As discussed in the British Elbow and Shoulder Society (BESS) / British Orthopaedic Association (BOA) patient care pathway for subacromial shoulder pain, physiotherapy has been shown to be an effective intervention (also see the NHS Choices page on shoulder pain). Corticosteroid injections may help those whose pain levels are initially too high to engage in physiotherapy, thereby kick starting their rehab process. Physiotherapy is an essential part of the rehab process for those who receive a subacromial corticosteroid injection.

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References

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