Corticosteroid injections for adhesive capsulitis: A review.

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Adhesive capsulitis (AC) is a relatively common condition that can have a significant impact on function and quality of life. Briefly, it consists of three phases: pain at rest and progressive loss of range of motion ("freezing" stage), stiffness without pain at rest ("frozen" stage), and gradual return of range of motion ("thawing" stage). It is classified as Primary AC (idiopathic) and Secondary AC (following trauma or with diabetes, for example). It is thought to be due to chronic inflammation and (subsequent) fibrosis, though uncertainty remains regarding underlying pathophysiology. It is self-limiting, usually lasting 2-3 years (or longer) before resolution is achieved. Individuals experiencing AC often seek treatment options to manage the pain and hasten recovery. Corticosteroid injection is commonly offered.

The purpose of this review was to evaluate corticosteroid injection effectiveness, in terms of disease duration and recovery. Sixteen randomized prospective studies involving corticosteroid injection for the treatment of AC compared with a control/comparison group were included in the review. Comparison group treatments included stretching, home exercises or (multi-modal) physiotherapy; injection with normal saline or lidocaine; corticosteroid or lidocaine bursal or subacromial injection; oral NSAIDs; as well as a combination of one or more of the aforementioned treatments, including corticosteroid injection. A few studies investigated the effect of corticosteroid injection dosing (three studies), injection location (glenohumeral versus subacromial) (three studies), and the effectiveness of using ultrasound guidance (one study). Finally, two studies specifically looked at corticosteroid injections in diabetics with AC. Notably absent in this review was hydrodistension as a comparator treatment modality. Follow-up began as early as one week post-treatment initiation, and the length of follow-up ranged from 6 weeks to 12 months.

Nine of 12 studies found a significant benefit of corticosteroid injection in terms of short-term pain reduction and mobility restoration compared to control group(s), with effects lasting between 2 and 24 weeks. The three studies that failed to find a significant benefit had comparison groups that received formal physical therapy.

With respect to corticosteroid dosing, 2 out of 3 studies did not find a significant difference between 20 mg and 40 mg of triamcinolone for pain relief or improved function. The third study used 3 injections spaced 1 week apart, and 40 mg doses were more effective than 10 mg injections. This review concluded that an injection of 20 mg of triamcinolone seemed to be as effective as 40 mg injections. Further research would be helpful in determining if there is an optimal dosing and injection frequency that provides the most benefit.

In terms of location, the three studies suggest that subacromial injections are just as effective in reducing pain and improving function, contrary to the common belief that glenohumeral injections are superior. Furthermore, one study that examined the effect of using ultrasound guidance (versus landmarked "blind") injections for AC over a 6 week period, found that the only significant difference was during the 2 weeks post-corticosteroid injection, with significantly improved pain, range of motion and function when ultrasound was used. This study

also involved weekly follow-up hyaluronate injections, however, which makes it difficult to evaluate the effect of the corticosteroid and use of ultrasound itself.

Remarkably, as diabetics are widely recognized as being at a significantly greater risk of developing AC, there is a paucity of research specifically investigating this population in the setting of AC. One study compared corticosteroid injection with NSAIDs, and another study compared corticosteroid injection with home exercises. Interestingly, the first study reported no difference in outcome at 24 weeks, and the second found reduced pain at, but not beyond 4 weeks, and improved function at, but not beyond 12 weeks. This suggests that diabetics may benefit less from corticosteroid injection for AC, than their nondiabetic counterparts.

In terms of adverse effects of corticosteroids injected at various joints in the body, the most common are injection related pain and injection site skin discolouration. Transiently increased blood glucose levels in diabetics have also been noted. There is the possibility of weakening tendons in the shoulder, especially with repeated injections or those that are improperly placed, and the risk of tendon rupture exists, although reportedly this is a small risk when done infrequently. Finally, the authors note that antiretroviral therapy (i.e. protease inhibitors) can interact with corticosteroids that are injected, resulting in an iatrogenic Cushing syndrome via respective inhibition of, and metabolism by, the P450 CYP(34A) pathway.

Overall, the authors of this review conclude that corticosteroids injected for AC can provide significant short-term pain reduction, with evidence of effect for at least 2 weeks, but up to 24 weeks post-injection. The evidence suggests that these injections can be intra-articular or subacromial, and that 20 mg may be as effective as 40 mg, when triamcinolone is used. At this time, there is insufficient evidence to suggest superiority of ultrasound guided versus landmarked injection. As well, formal physical therapy may be as effective as an injection. Unfortunately, diabetics may not benefit as much from such injections for AC and they can experience transiently raised blood sugar. Caution should be used when protease inhibitors are being taken, as an iatrogenic Cushing syndrome can develop.

This review certainly adds to the current knowledge regarding treatment and use of corticosteroid injections for AC. The conclusions can be used to more accurately discuss the potential benefits of injections, with special consideration for diabetics, and perhaps set more realistic expectations of the improvement they can expect. Furthermore, given the range in costs associated with different treatments, when funds and insurance coverage are limited, these conclusions can also help guide treatment decisions (i.e. physiotherapy versus injection, use of ultrasound guidance, etc).

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