

Specific Question:

In adults with adhesive capsulitis (frozen shoulder) does the use of high volume injection of local anaesthetic, saline and corticosteroid improve pain, function and range of movement when compared to low volume injection of local anaesthetic and corticosteroid?

Clinical bottom line

Good quality evidence suggests that high volume injection (steroid with local anaesthetic and saline) provides a greater beneficial effect on pain and range of motion in the short term over a low volume injection (steroid and local anaesthetic). Both provide an equal benefit in the long term.

Why is this important?

Currently both low and high volume injections are used in clinical practice to treat frozen shoulder. Determining the most effective type of injection improves patient management pathways within primary care and interface services and is essential for evidence based quality care.

Inclusion Criteria

	Description	Search terms
Population and Setting	Adults	Adults with adhesive capsulitis (frozen shoulder)
Intervention or Exposure	High volume injection of steroid and/or anaesthetic and or saline	Adhesive capsulitis/injections/distension/arthrography/bursitis/frozen shoulder/distension injection/hydrodilatation/distension arthrography/arthrographic distension/capsular distension
Comparison, if any	Low volume injection of steroid and anaesthetic	
Outcomes of interest	Pain, function, range of movement	
Types of studies	SR & RCT's only	

Routine Databases Searched

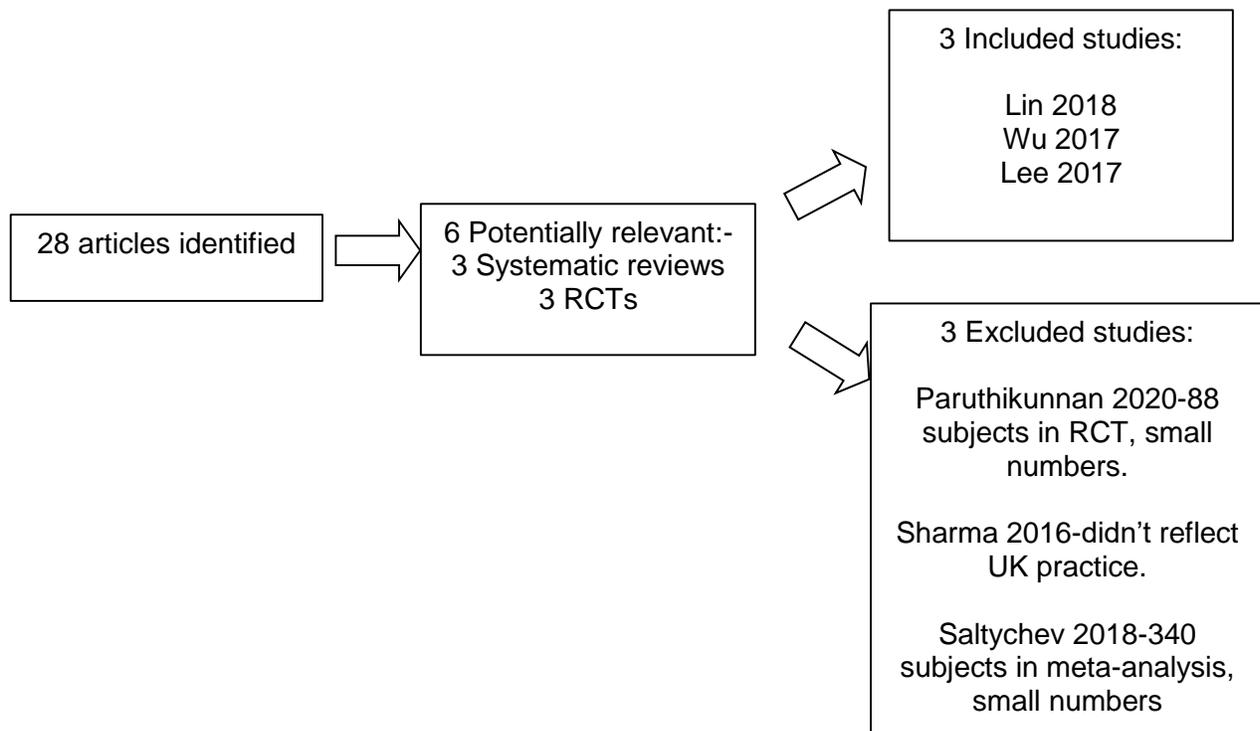
Medline, CINAHL, Pubmed, EMBASE, AMED, Cochrane

Search criteria

Adhesive capsulitis/injections/distension/arthrography/bursitis/frozen shoulder/distension injection/hydrodilatation/distension arthrography/arthrographic distension/capsular distension

Date of search- November 2018, updated February 2020.

Results of the search



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Table 1- Detail of included studies

First Author, year and type of study	Population and setting	Intervention or exposure tested	Study results	Assessment of quality and comments
Lin et al 2018	<p>Systematic review and Meta-analysis</p> <p>18 RCT's and 1 observational study in qualitative analysis</p> <p>8 RCT's in pair-wise meta-analysis (604 participants)</p> <p>Mean duration of symptoms 5.55 months (3.7-9 months)</p>	<p>Compared therapeutic effectiveness of IA steroid injection alone and distension in patients with frozen shoulder</p> <p>6/8 studies used steroid with saline and anaesthetic for the distension injection, the sensitivity analysis rejected 2 studies that used other drugs.</p> <p>Distension volume ranged from <25ml- >45ml</p>	<p>Primary outcome: functional improvement</p> <p>Secondary outcome: pain reduction & ROM improvement</p> <p>Short term (2-4 wk), Med term 6-16 wk) long term (>24 wk)</p> <p>Steroid injection alone and distension effective at all 3 time points, no difference. between them.</p> <p>After a sensitivity analysis- Distension significantly better than steroid injection on secondary outcomes of pain and ER improvement in short and med term only, not long term</p>	<p>Cochrane tool for quality.</p> <p>Used SMD of outcome scores to compare between studies</p> <p>Sample heterogeneity determined by I-squared and Cochrane Q methods.</p> <p>Funnel plot and eggert test for publication bias.</p> <p>Limitations; study populations differed i.e. various durations and disease severity. The numbers included in MA (8 studies) was not enough to provide strong evidence.</p>

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First Author, year and type of study	Population and setting	Intervention or exposure tested	Study results	Assessment of quality and comments
Wu et al 2017	<p>Systematic review and meta-analysis</p> <p>21 studies identified (11 qualitative analysis, 11 meta-analysis =747 participants)</p> <p>No record of duration of symptoms.</p>	<p>Investigated the effectiveness of capsular distension for adhesive capsulitis in function improvement and mobility recovery from high quality RCT's.</p> <p>Volumes for hydrodilatation ranged from 20ml-90ml, 20/21 studies used steroid with saline and local anaesthetic. Dilatation injection performed under Ultrasound or fluoroscopic guidance in 19/21 studies.</p>	<p>Primary outcome shoulder function.</p> <p>Secondary outcome ROM.</p> <p>Time points: 1) before treatment 2) first post-treatment visit 3) end of trial visit.</p> <p>No significant differences in treatments on primary outcome of shoulder function early after intervention or at the end of the trial.</p> <p>Distension was better than steroid alone in improving external rotation early after treatment, but not in the long term.</p>	<p>Cochrane tool for quality</p> <p>Used SMD of outcome scores to compare between studies</p> <p>Sample heterogeneity determined by chi-squared and I-squared tests.</p> <p>Funnel plot and egggers test for publication bias.</p> <p>Limitations; time points not well standardised to specific durations of weeks/months which lead to variation, could have influenced results.</p>

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First Author, year and type of study	Population and setting	Intervention or exposure tested	Study results	Assessment of quality and comments
Lee et al 2017	RCT 235 subjects refractory adhesive capsulitis. 168 improved after initial injection, so 67 progressed to randomisation (32 each group). Duration of symptoms 6.1-9.7 months.	All participants had an ultrasound guided steroid injection initially – same practitioner, plus exercises. High volume capsule preserving dilatation V's low volume (Ultrasound guided average volume 25.1+/- 6.1ml).	Primary outcome SPADI Secondary outcome VAS & Passive ROM Assessed at pre-treatment 0 wk, 3 wk, 6 wk, 12 wk by independent assessor All outcome measures improved in both groups over time No sig. difference in group by time interactions	Good randomisation. Blinded assessor. Post randomisation the groups may not have been large enough to detect a clinically significant effect between the 2 groups. Despite 6 week observation following initial steroid injection, it may have affected the results.

Summary

In patients that have had frozen shoulder for longer than 3 months distension injection of local anaesthetic, saline and corticosteroid (volume range 19ml-90ml) provided greater benefit compared to low volume injection of local anaesthetic and corticosteroid in the short term in pain and ROM scores (within 2-4 weeks), but not in functional outcome scores such as SPADI, however the benefit reduces in the medium (6-16weeks) to long term (>24 weeks).

Implications for Practice/research

High volume injection (steroid with local anaesthetic and saline) provides a greater beneficial effect on pain and range of motion in the short term over a low volume injection (steroid and local anaesthetic), both provide an equal benefit in the long term. It is of benefit to offer both types of injection, however high volume injections may not be

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widely available and do carry some increased risk. Both types should be discussed with the patient to make an informed decision, enabling patient choice.

What would you tweet?

Good quality evidence shows high volume injection better for pain and ROM in short term than low volume injection for frozen shoulder.

References

Lin MT., Hsiao MY., Tu YK. and Wang TG. Comparative efficacy of intra-articular steroid injection and distension in patients with frozen shoulder: A systematic review and network meta-analysis. Archives of Physical Medicine and Rehabilitation (2018) 99 (7); 1383-94

Wu WT., Chang KV., Han DS., Chang CH., Yang FS. and Lin CP. Effectiveness of glenohumeral joint dilatation for treatment of frozen shoulder: A systematic review and meta-analysis of randomized controlled trials. Scientific Reports. (2017) 7 (1) 10507

Lee DH., Yoon SH., Lee MY., Kwack KS and Rah U. Capsule-preserving Hydrodilatation with Corticosteroid versus Corticosteroid injection alone in refractory adhesive capsulitis of shoulder: A randomized controlled trial. Archives of Physical Medicine and Rehabilitation.(2017) 98 (5): 815-21.