Corticosteroid injections for the treatment of hand and wrist disorders in general practice
Peters-Veluthamaningal, Cyriac

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Chapter 3

Corticosteroid injection for de Quervain's tenosynovitis

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Abstract

Background
De Quervain's tenosynovitis is a disorder characterized by pain on the radial (thumb) side of the wrist and functional disability of the hand. It can be treated by corticosteroid injection, splinting and surgery.

Objectives
To summarize evidence on the efficacy and safety of corticosteroid injections for de Quervain's tenosynovitis.

Search methods

Selection criteria
Randomized and controlled clinical trials evaluating efficacy and safety of corticosteroid injections for de Quervain's tenosynovitis were selected.

Data collection and analysis
Databases were searched for titles of eligible studies. After screening abstracts of these studies full text articles of studies which fulfilled the selection criteria were obtained. Data were extracted using a predefined electronic form. The methodological quality of included trials was assessed by using the checklist developed by Jadad and the Delphi list. Data were extracted regarding information on the primary outcome measures treatment success, severity of pain or tenderness at the radial styloid, functional impairment of the wrist or hand, outcome of Finkelstein's test and the secondary outcome measures proportion of patients with side-effects, type of side-effects and patient satisfaction with injection treatment.

Results
One controlled clinical study was found, including 18 participants, comparing one steroid injection with methylprednisolone and bupivacaine to splinting with a thumb spica. All patients in the steroid injection group (9/9) achieved complete relief of pain and none of the patients in the thumb spica group (0/9) had complete relief of pain one to six days after intervention (NNT: 1, 95% CI 0.8 to 1.2). No side effects or local complications of steroid injection were noted.

Authors' conclusions
Efficacy of corticosteroid injections for de Quervain's tenosynovitis was studied in only one small controlled clinical trial that compared local injection of methylprednisolone with bupivacaine to splinting with a thumb spica in pregnant and lactating women. The level of evidence for superiority of steroid injections over thumb spica splinting can be graded as silver. However, the applicability of our findings for daily clinical practice seems limited since there was only one study included with a small number of included participants, the methodological quality of the included study was poor and only pregnant and lactating women participated in the study. No adverse effects were observed.
Background

De Quervain's tenosynovitis is a disorder that is characterized by pain, tenderness, and swelling over the thumb side of the wrist (at the radial styloid process), especially with sideward movements of the wrist and often leads to impairment of thumb function. It is caused by impaired gliding of the tendons of the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) muscles\(^1\). These two tendons have almost the same function: the movement of the thumb away from the hand in the plane of the hand. The impaired gliding is most probably caused by thickening of the extensor retinaculum (the thickened part of the general tendon sheath that holds the tendons of the extensor muscles in place) of the wrist.

De Quervain, a Swiss physician, is given credit for first describing this condition with a report of five cases in 1895 and eight additional cases in 1912\(^2,3\). Although the term stenosing tenosynovitis is frequently used, pathophysiology of de Quervain's disease does not involve inflammation. On histopathological examination predominant features are degenerative changes (myxoid degeneration, fibrocartilagenous metaplasia and deposition of mucopolysaccharide)\(^4\). Most probably pain is elicited by mechanical impingement between the tendon and it's narrowed fibro-osseous canal resulting in stimulation of nociceptors.

De Quervain's tenosynovitis is suggested to fall under umbrella terms such as repetitive strain injury (RSI) and work-related musculoskeletal disorders of the upper limb (WRMSDs-UL)\(^5,6\). Several authors have proposed models in which complex interactions between genetic factors, biomechanical factor's, biophysical characteristics and psychological profile of a patient lead to WRMSD's\(^7,8\). In a literature review of epidemiological studies strong evidence was found for links between some biomechanical risk factors and musculoskeletal disorders of the upper limb\(^9\). Some have questioned a causative role of work for de Quervain's tenosynovitis\(^10\).

In a large community based study from the United Kingdom the prevalence of de Quervain's tenosynovitis was 0.5% for men and 1.3% for women and was associated with considerable impact on daily activities and health seeking behaviour\(^11\). Data from the 1998 National Health Interview Survey/ Occupational Health Supplement in the United States show an estimated 12 month period prevalence of 0.31% of tendinitis of the hand, wrist and elbow (including tendinitis, synovitis, tenosynovitis, de Quervain's disease and epicondylitis) amongst 127 million workers\(^12\). The annual cost of all WRMD's is estimated to range from 13 to 20 billion US dollars in the United States\(^7\).

The diagnosis is made by history and physical examination\(^1\). Symptoms consist of pain or tenderness at the radial styloid sometimes radiating to the thumb, forearm or shoulder and on physical examination there might be swelling at the radial styloid with tenderness and crepitations on palpation. Finkelstein's test (deviating the wrist to the ulnar side, while grasping the thumb, results in pain) is typically positive. A positive Finkelstein's test has a between observer repeatability (k) of 0.79\(^13\). Unfortunately there is no golden diagnostic confirmatory test for de Quervain's tenosynovitis. In the literature a variety of terminology (e.g. tendinitis, peritendinitis, tenosynovitis, tendovaginitis) and case-definitions are used for this condition. In 1998 and 2001 efforts have been made to construct reliable classifications and case-definitions for soft-tissue rheumatic disorders of the upper limb, including de Quervain's tenosynovitis\(^5,14\).

De Quervain's tenosynovitis can be treated by operative and non-operative treatment options. Operative therapy (slitting or removing a strip of the tendon sheet) has been
reported to be effective with a 91% cure rate, but is more invasive and associated with higher costs and the possibility of surgical complications\textsuperscript{15}. Injection of local anaesthetics and corticosteroids for musculoskeletal diseases became popular in the 1950's. The effectiveness of injection therapy is often attributed to anti-inflammatory effects of corticosteroids but the exact mechanism of action remains unclear since on histopathological examination inflammation could not be demonstrated. In a systematic review of effectiveness of corticosteroid injection for de Quervain's tenosynovitis including seven (observational) studies with including a total of 459 wrists, 83\% of the 226 wrists that received injection alone were cured, 61\% of the 101 wrists that received injection and splint immobilization were cured and 14\% of those who received splinting alone were cured\textsuperscript{16}. Other conservative treatment modalities, such as heat, cold, heat induction, strapping, splints, rest, massage, counterirritants and medications were found not to be effective\textsuperscript{1}. Potential complications of local corticosteroid injections for musculoskeletal disorders such as de Quervain's tenosynovitis are local infection, post injection steroid flare (temporary worsening of pain in the first 24-36 hours after injection), atrophy (thinning) of subcutaneous fat, local depigmentation of the skin and very rarely tendon rupture\textsuperscript{17}. Since de Quervain's tenosynovitis can lead to marked disability and absence from work due to impaired functioning of the hand and local corticosteroid injection has been suggested to be effective, safe and easy to apply it was decided to perform a systematic review of efficacy and safety of corticosteroid injections for de Quervain's tenosynovitis.

Although the effectiveness of corticosteroid injections has been addressed in a previous systematic review by Richie it was believed that a more comprehensive review according to the conventions of the Cochrane Collaboration can provide additional valuable information\textsuperscript{16}. Major shortcomings of the Richie review were that only MEDLINE and Ovid databases were searched, search strategy, selection criteria and data synthesis were not specified and pooling of data was not performed in a standardized manner and none of the found studies was randomised or used controls.

**Objectives**

The objective was to review systematically the evidence from clinical trials on the efficacy and safety of corticosteroid injections for de Quervain's tenosynovitis in adults.

**Methods**

**Criteria for considering studies for this review**

**Types of studies**

All randomised controlled trials and controlled clinical trials evaluating injection therapy with corticosteroids were included in this review.

**Types of participants**

Only studies containing a study population with a clinical diagnosis of de Quervain's tenosynovitis (pain and tenderness over the radial styloid and either pain at the radial styloid reproduced by resisted thumb extension or positive Finkelstein's test result) were included. Studies addressing treatment of De Quervain's tenosynovitis of infectious origin were excluded.
Types of interventions

Only studies evaluating effectiveness of local corticosteroid injections were included. The corticosteroid may have been of any volume, type and concentration, a local anaesthetic agent may have been added or not and any injection technique may have been used. It was planned to include studies comparing corticosteroid injection to placebo, injection with local anaesthetic, injection with a different type of steroid, splinting, systemic analgesics (including NSAID's), systemic steroids, operation, combination treatments or no intervention.

Types of outcome measures

Primary:
- treatment success: yes or no (definition of treatment success may vary across trials)
- severity of pain or tenderness at the radial styloid
- Finkelstein's test negative: yes or no
- functional status of the finger (using validated instruments to measure hand function)
- proportion of patients with adverse effects of steroid injection

Secondary:
- patient satisfaction (using validated questionnaires)

Search methods for identification of studies

The following electronic databases were searched:
- MEDLINE (1966 – April 2009, Ovid platform)
- EMBASE (1956 - April 2009, Ovid platform)
- CINAHL (1982 - April 2009, Ovid platform)
- AMED (1985 - April 2009, Ovid platform)
- PEDro, the physiotherapy evidence database
- CENTRAL, the Cochrane Collaboration trials register
- DARE, The Database of Abstracts of Reviews of Effectiveness
- Dissertation abstracts

The search strategy was developed for MEDLINE and modified as necessary for the other databases. Complete search strategies for each database are provided in Appendix 1; Appendix 2; Appendix 3; Appendix 4; Appendix 5; Appendix 6; Appendix 7; Appendix 8. The references of all relevant publications (RCT’s and reviews) were checked to identify additional trials. Content experts were contacted for unpublished data. There were no language restrictions.

Data collection and analysis

Trial selection

Two review authors independently selected trials for inclusion in this review based on the content of title and abstracts obtained through electronic searching of the databases. Each review author's selection was compared. Any discrepancies in opinion about eligibility of a trial for this review were resolved by discussion and consensus by the two review authors.
Quality appraisal

Two review authors independently extracted all data. Each trial was assessed by using a combination of an established quality assessment tool developed by Jadad\(^\text{18}\) and the Delphi list\(^\text{19}\). The quality items assessed were:

1. randomisations
2. concealment of allocation
3. blinding of outcome assessor, care provider, and patient
4. reporting of withdrawals and dropouts
5. similarity of groups at baseline regarding most important prognostic indicators
6. specification of eligibility criteria
7. availability of point estimates and measures of variability of primary outcome measures
8. use of intention-to-treat analysis

Each criterion was rated as adequate, inadequate or unclear (if insufficient information was presented).

Data extraction

Details regarding the study population, interventions, treatment periods, length of follow-up, complications, baseline demographic data and baseline and end of study outcomes were extracted using a pre-defined electronic form by two review authors. Short-term outcomes were arbitrarily defined as outcomes up to three months after the intervention and long-term outcomes as outcomes one year post-intervention or later. Referring back to the original article and establishing consensus resolved differences in data extraction. A third reviewer was consulted to help resolve differences.

Analysis

For continuous data, mean differences (MD) were planned to be calculated for outcomes measured using the same scale, and when the same outcomes were measured using different scales, standardized mean differences (SMD) were to be used. Absolute and relative difference in the change from baseline were to be calculated for continuous outcomes. Absolute benefit was to be calculated as the improvement in the treatment group minus the improvement in the control group in original units. Relative difference in the change from baseline was to be calculated as the absolute benefit divided by the baseline mean.

For dichotomous data, the results for each study were planned to be presented as relative risk and the number needed to treat. However a post hoc decision was made to present the results as risk difference (RD) and number needed to treat (NNT) to benefit, as only one eligible study was identified and no events (treatment success) was observed in any of the participants in the control group.

Heterogeneity

To assess heterogeneity of trial results the Cochrane Q-test and I\(^2\)-test was planned to be used. In case of significant statistical heterogeneity potential sources were planned to be explored by subgroup analysis. Since clinical and methodological diversity always occur in a meta-analysis, statistical heterogeneity is inevitable, the test for heterogeneity is irrelevant to the choice of analysis;\(^\text{50}\) accordingly the random-effects model was used by default as it is will be identical to the fixed-effects model if there is no heterogeneity (I\(^2\)=0%). In order to assess and quantify the possible magnitude of inconsistency (i.e. heterogeneity) across studies, we use I\(^2\) with a rough guide for interpretation as follows: 0% to 40% might not be important; 30% to 60% may
represent moderate heterogeneity; 50% to 90% may represent substantial heterogeneity; 75% to 100% considerable heterogeneity.

**Subgroup analysis**
- duration of symptoms at baseline, short if symptoms were present for up to four weeks, intermediate if symptoms were present for one month to one year, and long if symptoms were present for one year or longer.
- trial design: RCT or controlled clinical trial.

**Clinical relevance tables**
Clinical relevance tables were compiled for primary outcomes under Additional Tables to improve the readability of the review. For dichotomous outcomes, the weighted absolute risk difference was calculated using the risk difference (RD) statistic in RevMan. RR-1 calculates the weighted relative percent change. The number needed to treat (NNT) was determined by calculating the inverse of the risk difference (RD).

**Grading of evidence**
The evidence obtained in this systematic review was finally graded according to conventions as proposed by the Cochrane Musculoskeletal Group:

- **Platinum**: A published systematic review that has at least two individual controlled trials each satisfying the following:
  - Sample sizes of at least 50 per group - if these do not find a statistically significant difference, they are adequately powered for a 20% relative difference in the relevant outcome.
  - Blinding of patients and assessors for outcomes.
  - Handling of withdrawals > 80% follow up (imputations based on methods such as Last Observation Carried Forward (LOCF) are acceptable).
  - Concealment of treatment allocation.

- **Gold**: At least one randomised clinical trial meeting all of the following criteria for the major outcome(s) as reported:
  - Sample sizes of at least 50 per group - if these do not find a statistically significant difference, they are adequately powered for a 20% relative difference in the relevant outcome.
  - Blinding of patients and assessors for outcomes.
  - Handling of withdrawals > 80% follow up (imputations based on methods such as LOCF are acceptable).
  - Concealment of treatment allocation.

- **Silver**: A systematic review or randomised trial that does not meet the above criteria. Silver ranking would also include evidence from at least one study of non-randomised cohorts that did and did not receive the therapy, or evidence from at least one high quality case-control study. A randomised trial with a 'head-to-head' comparison of agents would be considered silver level ranking unless a reference were provided to a comparison of one of the agents to placebo showing at least a 20% relative difference.

- **Bronze**: The bronze ranking is given to evidence if at least one high quality case series without controls (including simple before/after studies in which patients act as
their own control) or if the conclusion is derived from expert opinion based on clinical experience without reference to any of the foregoing (for example, argument from physiology, bench research or first principles).
This review will be updated two years after publication.

Results

Description of studies
The search resulted in a total of 561 titles from searches in MEDLINE, EMBASE, AMED, CINAHL, CENTRAL, DARE and Dissertation abstracts. No titles were found in PEDro. After screening the titles and abstracts 5 possible studies were selected for further evaluation (Avci 2002; Goldfarb 2007; Jirarattanaphochai 2004; Kosuwon 1996; Weiss 1994)22-26. Full text articles of these five studies were retrieved. Three studies were excluded: one appeared to be a retrospective cohort study (Weiss 1994) and three studies did not study the comparison of interest (in one study steroid injection was compared to steroid injection with additional oral medication (Jirarattanaphochai 2004), one study steroid injection was compared to steroid injection followed by wrist immobilization in a splint (Kosuwon 1996) and in one injection with steroid, lidocaine and bupivacaine alone were compared to injections with steroid, lidocaine, bupivacaine and bicarbonate (Goldfarb 2007).

We were also aware of an ongoing randomised controlled trial assessing effectiveness of corticosteroid injections in the setting of primary care, but the results of the study were not published yet when our search was performed (see Characteristics of ongoing studies).

The included study (Avci 2002) was a controlled clinical study including 19 wrists in 18 pregnant or lactating women (5 wrists of pregnant women, 14 of pregnant women). It compared one injection of 0.25 ml of methylprednisolone (10 mg) with 0.5% bupivacaine the to thumb spica splinting in the setting of secondary care. Injections were given into the tendon-sheath. Diagnostic criteria were a tender nodule over the radial styloid and a positive Finkelstein’ s test result. The main outcome (complete pain relief and a negative Finkelstein test result) was measured 1 to 6 days after injection.

Risk of bias in included studies
The included study used pseudo-randomisation (participants were randomised according to their order of application), there was no description of allocation concealment (but since there was alternate allocation it is likely that allocation concealment was inadequate) and participants, care providers and outcome assessors were not blinded. Withdrawals and drop-outs were reported, an intention to treat analysis was used, but it was not clear whether the two treatment groups were similar at baseline assessment regarding important prognostic indicators. The main outcome measure was "complete pain relief". No point estimates and measures of variability were presented for the outcome measures.

Effects of interventions
The only primary outcome measure that was assessed was complete relief of pain. All patients in the steroid injection group (9/9) achieved complete relief of pain and none of the patients in the thumb spica group (0/9) had complete relief of pain one to six days after intervention. The number needed to treat was thus 1 (95% CI 0.8 to 1.2).
No side effects or local complications of steroid injection were noted (Analysis 1.1)(Table 1).

Discussion

In this review, including only one small controlled clinical trial (Avci 2002) with 18 participants, silver level evidence was found for superiority of corticosteroid injection over thumb spica splinting within 6 days of injection. The number needed to treat was 1 for this intervention, which means that every participant treated with local corticosteroid injection for de Quervain's tenosynovitis achieves complete relief of pain within six days of treatment, while none of the participants treated with thumb spica splints achieves complete relief of pain.

The large effect size of steroid injections for de Quervain's tenosynovitis reported in this review is consistent with findings in another systematic review including only non-randomised studies, in which a cure-rate of 83% in 459 wrists for steroid injections alone was reported and no side-effects were observed.

There are several important limitations to this review. Only one study was found, the study included only 18 participants. The risk of bias may be considerable since the included study used pseudo-randomisation and allocation concealment and blinding were inadequate. The study included a selected patient-population (pregnant and lactating women), was carried out in a selected healthcare setting (specialist hospital care), compared effectiveness of local corticosteroid only to thumb spica splinting and therefore generalizability may be limited. Finally long term treatment effects were not assessed. Given the weak evidence base it is not possible to draw firm conclusions regarding the effectiveness of steroid injections for de Quervain tenosynovitis. The applicability of the findings of this review for daily clinical practice may therefore be limited and need to be confirmed in larger, better designed randomised controlled trials of longer duration.

Several other issues regarding steroid injections for de Quervain's tenosynovitis remain to be clarified: there is no universally agreed case definition and there are no validated outcome measures for research purposes. Efficacy, safety and cost-effectiveness of steroid injection has never been compared directly to surgical therapy or a wait and see strategy and long term effectiveness has never been studied.

Authors' conclusions

Implications for practice

There is silver level evidence that corticosteroid injections are superior to thumb spica splinting for the treatment of de Quervain's tenosynovitis in relieving pain, but the evidence is based on one very small controlled clinical trial of short duration and poor methodological quality that included only pregnant and lactating women.

Implications for research

A case-definition for de Quervain's tenosynovitis for research purposes should be formulated. Validated and relevant outcome measures for interventions for de Quervain's tenosynovitis should be developed. Future RCT’s should have adequate sample sizes, better methodological quality (especially adequate randomisations procedures and allocation concealment), study also other types of participants (besides pregnant and lactating women), longer follow-up is needed and the findings should be reported according to the CONSORT statement. More comparison studies...
are needed: comparing corticosteroid injections to placebo, to surgery and comparing different types and dosages of corticosteroids. Future studies should also address the natural course of de Quervain's tenosynovitis.

Acknowledgements

We would like to thank Louise Falzon (trial search co-ordinator of the Cochrane Musculoskeletal Group) for her assistance in developing the search strategy and performing the searches and the Australian Editorial Base Coordinators for the Musculoskeletal Group Miranda Cumpston and Renea Johnston for their assistance in writing this review.

Contributions of authors

CP: main author
DW: text of review, data extraction and analysis
JW: data extraction and analysis
BM: selection of studies

Declarations of interest

CP has conducted a randomised controlled trial (Groningen Hand and Wrist Injection Therapy Trial- HAWITT), assessing efficacy and safety of corticosteroid injections for trigger finger, de Quervain's tenosynovitis and carpal tunnel syndrome in a primary care population. The HAWITT-trial is sponsored by an unrestricted educational grant by the pharmaceutical company Bristol-Myers Squibb.

Characteristics of studies

Characteristics of included studies

Avci 2002

<table>
<thead>
<tr>
<th>Methods</th>
<th>Randomised controlled study: allocation of intervention based on order of application. Method of blinding unclear. Parallel groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Secondary care: Pregnant (5 participants) or lactating (13 participants) women. mean age 28 years (range: 20-36) Inclusion criteria: tender nodule over the radial styloid and a positive Finkelstein's test result Exclusion criteria: a past history of similar symptoms, systemic disorders such as diabetes or connective tissue diseases that cause tenosynovitis flow of participants: 18 enrolled, 18 randomised, 9 randomised to corticosteroid + anaesthetic injection vs 9 randomised to thumb spica splinting, 18 received allocated intervention, 0 lost to follow-up, 18 participants analysed</td>
</tr>
<tr>
<td>Interventions</td>
<td>Group 1: one injection of 0.25 ml of methylprednisolone (10 mg) with 0.5% bupivacaine into the tendon sheath Group 2: thumb spica splints worn during daytime</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Definition of treatment success: complete relief of pain and a negative Finkelstein test result</td>
</tr>
</tbody>
</table>

Notes

Risk of bias table

<table>
<thead>
<tr>
<th>Item</th>
<th>Judgement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment?</td>
<td>No</td>
<td>Unlikely to be adequately concealed, as allocation of intervention based on order of application</td>
</tr>
</tbody>
</table>
Chapter 3

Characteristics of excluded studies:

**Goldfarb 2007**

Reason for exclusion: not comparison of interest: steroid injection was compared to steroid injection with additional oral medication.

**Jirarattanaphochai 2004**

Reason for exclusion: not comparison of interest: steroid injection was compared to steroid injection with additional oral medication.

**Kosuwon 1996**

Reason for exclusion: not comparison of interest: steroid injection was compared to steroid injection followed by wrist immobilization in a splint.

**Weiss 1994**

Reason for exclusion: not a randomised study: retrospective cohort study.

Characteristics of ongoing studies:

**Peters-Veluthamaningal 2007 (Unpublished data only; ISRCTN: 53171398)**

**Study name**
The Groningen Hand and Wrist Injection Therapy Trial

**Methods**
Randomized controlled study
Blinding of participants and outcome assessors.
Parallel groups.

**Participants**
Primary care.
Adults.
Inclusion criteria: a history of radial styloid tenderness and a positive Finkelstein’s test and/or crepitus over APB and EPL-tendons
Exclusion criteria: less than 18 years of age, presence of an absolute contraindication for corticosteroid injection, prior treatment in the last six months with steroid injection and/or surgery at the same anatomical location, possible traumatic or neoplastic origin of symptoms, inability to fill in follow-up forms or absence of self-determination in the participant.

**Interventions**
Group 1: one or two injections of 1 ml triamcinolonacetonide 10 mg/ml
Group 2: one or two injections of 1 ml 0.9 % NaCl

**Outcomes**
1. direct treatment response (consensus between physician and patient): no response; partial response, but not satisfactory, warranting further treatment; partial response, satisfactory, not warranting further treatment; complete resolution of symptoms and signs
2. perceived improvement (by patient): much worse, worse, not better/not worse, better, much better
3. severity of pain at the radial styloid: 11 point numeric rating scale: 0-10
4. Functional improvement using the sub items hand and finger function of the Dutch version of the second version of the Arthritis Impact Measurement Scale (DUTCH AIMS-2)

**Starting date**
2003

**Contact information**
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**Notes**
Additional tables

1 Clinical relevance for complete pain relief

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Control event rate</th>
<th>Relative % change</th>
<th>NNTB</th>
<th>Statistical significance</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>complete pain relief</td>
<td>0% (0 out of 18)</td>
<td>1800% (0 [27%, 28,300%])</td>
<td>1 (0.8, 1.2)</td>
<td>statistically significant</td>
<td>silver</td>
</tr>
</tbody>
</table>

legend

RD = risk difference
95% CI = 95% confidence interval
I = improvement
NNTB = number needed to treat to benefit

Data and analyses

1 0.25 ml of methylprednisolone (10 mg) + 0.5% bupivacaine vs thumb spica splint

<table>
<thead>
<tr>
<th>Outcome or Subgroup</th>
<th>Studies</th>
<th>Participants</th>
<th>Statistical Method</th>
<th>Effect Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Complete relief of symptoms</td>
<td>1</td>
<td></td>
<td>Risk Difference (M-H, Random, 95% CI)</td>
<td>Subtotals only</td>
</tr>
</tbody>
</table>

Sources of support

Internal sources

- Department of General Practice, University Medical Center Groningen, Netherlands
- EMGO Institute, VU University Medical Center Amsterdam, Netherlands

External sources

- No sources of support provided
Appendices

1 Medline search strategy:
1. exp tenosynovitis/
2. tenosynovitis.tw.
3. exp TENDINITIS/
4. tend?nitis.tw.
5. peritendinitis.tw.
6. tendovaginitis.tw.
7. quervain$.tw.
8. exp Cumulative Trauma Disorders/
9. overuse syndrome$.tw.
10. repetit$ strain injur$.tw.
11. repetit$ motion disorder$.tw.
12. or/1-11
13. exp GLUCOCORTICOID$S/
14. glucocorticoid$.tw.
15. exp Adrenal Cortex Hormones/
16. corticoster$.tw.
17. exp Methylprednisolone/
18. methylprednisolone.tw.
19. exp BETAMETHASONE/
20. betamethasone.tw.
21. exp TRIAMCINOLONE/
22. triamcinolone.tw.
23. (steroid$ adj2 inject$).tw.
24. or/13-23
25. 12 and 24
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2 EMBASE search strategy:
1. exp TENOSYNOVITIS/
2. tenosynovitis.tw.
3. exp TENDINITIS/
4. tend?nitis.tw.
5. peritendinitis.tw.
6. tendovaginitis.tw.
7. quervain$.tw.
8. exp Cumulative Trauma Disorder/
9. overuse syndrome$.tw.
10. repetit$ strain injur$.tw.
11. repetit$ motion disorder$.tw.
12. or/1-11
13. exp Glucocorticoid/
14. glucocorticoid$.tw.
15. exp Corticosteroid/
16. corticoster$.tw.
17. exp METHYLPREDNISOLONE/
18. methylprednisolone.tw.
19. exp BETAMETHASONE/
20. betamethasone.tw.
21. exp TRIAMCINOLONE/
22. triamcinolone.tw.
23. (steroid$ adj2 inject$).tw.
24. or/13-23
25. 12 and 24
26. random$.ti,ab.
27. factorial$.ti,ab.
28. (crossover$ or cross over$ or cross-over$).ti,ab.
29. placebo$.ti,ab.
30. (doubl$ adj blind$).ti,ab.
31. (singl$ adj blind$).ti,ab.
32. assign$.ti,ab.
33. allocat$.ti,ab.
34. volunteer$.ti,ab.
35. crossover procedure.sh.
36. double blind procedure.sh.
37. randomized controlled trial.sh.
38. single blind procedure.sh.
39. or/26-38
40. exp animal/ or nonhuman/ or exp animal experiment/
41. exp human/
42. 40 and 41
43. 40 not 42
44. 39 not 43
3 CINAHL search strategy:
1. exp tenosynovitis/
2. tenosynovitis.tw.
3. exp TENDINITIS/
4. tend?nitis.tw.
5. peritendinitis.tw.
6. tendovaginitis.tw.
7. quervain$.tw.
8. exp Cumulative Trauma Disorders/
9. overuse syndrome$.tw.
10. repetit$ strain injur$.tw.
11. repetit$ motion disorder$.tw.
12. or/1-11
13. exp GLUCOCORTICOID$S/
14. glucocorticoid$.tw.
15. exp Adrenal Cortex Hormones/
16. corticoster$.tw.
17. exp Methylprednisolone/
18. methylprednisolone.tw.
19. exp BETAMETHASONE/
20. betamethasone.tw.
21. exp TRIAMCINOLONE/
22. triamcinolone.tw.
23. (steroid$ adj2 inject$).tw.
24. or/13-23
25. 12 and 24

4 AMED search strategy:
1. exp Tenosynovitis/
2. tenosynovitis.tw.
3. tend?nitis.tw.
4. peritendinitis.tw.
5. tendovaginitis.tw.
6. quervain$.tw. (12)
7. overuse syndrome$.tw.
8. repetit$ strain injur$.tw.
9. repetit$ motion disorder$.tw.
10. or/1-9
11. exp Adrenal cortex hormones/
12. glucocorticoid$.tw.
13. corticoster$.tw.
14. methylprednisolone.tw.
15. betamethasone.tw.
16. triamcinolone.tw.
17. (steroid$ adj2 inject$).tw.
18. or/11-17
Corticosteroid injection for de Quervain's tenosynovitis

5 PEDro search strategy:
Search 1
Tenosynovitis in Abstract or title and Body Part = hand or wrist
Search 2
Tendon in Abstract or title and Body Part = hand or wrist
Search 3
Quervain* in Abstract or title

6 CENTRAL search strategy:
#1 MeSH descriptor Tenosynovitis explode all trees in MeSH products?
#2 tenosynovitis in All Fields in all products?
#3 MeSH descriptor Tendinitis explode all trees in MeSH products?
#4 tendonitis or tendinitis in All Fields in all products?
#5 peritendinitis in All Fields in all products?
#6 tendovaginitis in All Fields in all products?
#7 quervain* in All Fields in all products?
#8 MeSH descriptor Cumulative Trauma Disorders explode all trees in MeSH products?
#9 overuse syndrome* in All Fields in all products?
#10 repetit* next strain next injur* in All Fields in all products?
#11 repetit* next motion next disorder* in All Fields in all products?
#12 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11)?
#13 MeSH descriptor Glucocorticoids explode all trees in MeSH products?
#14 glucocorticoid* in All Fields in all products?
#15 MeSH descriptor Adrenal Cortex Hormones explode all trees in MeSH products?
#16 corticoster* in All Fields in all products?
#17 MeSH descriptor Methylprednisolone explode all trees in MeSH products?
#18 Methylprednisolone in All Fields in all products?
#19 betamethasone in All Fields in all products?
#20 MeSH descriptor Betamethasone explode all trees in MeSH products?
#21 MeSH descriptor Triamcinolone explode all trees in MeSH products?
#22 TRIAMCINOLONE in All Fields in all products?
#23 steroid* near/2 inject* in All Fields in all products?
#24 (#13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #21 OR #22 OR
#23)?
#25 (#12 AND #24)
Chapter 3

7 DARE search strategy:
#1 MeSH descriptor Tenosynovitis explode all trees in MeSH products?
#2 tenosynovitis in All Fields in all products?
#3 MeSH descriptor Tendinitis explode all trees in MeSH products?
#4 tendonitis or tendinitis in All Fields in all products?
#5 peritendinitis in All Fields in all products?
#6 tendovaginitis in All Fields in all products?
#7 quervain in All Fields in all products?
#8 MeSH descriptor Cumulative Trauma Disorders explode all trees in MeSH products?
#9 overuse syndrome* in All Fields in all products?
#10 repetit* next strain next injur* in All Fields in all products?
#11 repetit* next motion next disorder* in All Fields in all products?
#12 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11)?
#13 MeSH descriptor Glucocorticoids explode all trees in MeSH products?
#14 glucocorticoid* in All Fields in all products?
#15 MeSH descriptor Adrenal Cortex Hormones explode all trees in MeSH products?
#16 corticoster in All Fields in all products?
#17 MeSH descriptor Methylprednisolone explode all trees in MeSH products?
#18 Methylprednisolone in All Fields in all products?
#19 betamethasone in All Fields in all products?
#20 MeSH descriptor Betamethasone explode all trees in MeSH products?
#21 MeSH descriptor Triamcinolone explode all trees in MeSH products?
#22 TRIAMCINOLONE in All Fields in all products?
#23 steroid* near/2 inject* in All Fields in all products?
#24 (#13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #21 OR #22 OR #23)?
#25 (#12 AND #24)

8 Dissertation abstracts search strategy:
(Quervain* OR overuse syndrome* OR repetitive strain OR repetitive motion) AND
(glucocorticoid* OR corticoster*)
References


