Randomised controlled study of postinjection immobilisation after intra-articular glucocorticoid treatment for wrist synovitis

T Weitoft, L Rönnblom

Background: Intra-articular glucocorticoid treatment is frequently used in arthritic disorders. Postinjection rest has been shown to improve the outcome of knee injections. Objective: To investigate whether better treatment results might also be achieved by a similar postinjection regimen for the wrist, which is non-weightbearing.

Methods: 117 patients with rheumatoid arthritis and wrist synovitis were treated with intra-articular glucocorticoid injections. The patients were randomly allocated to 48 hour postinjection immobilisation in elastic wrist orthoses (n=58) or to normal postinjection activity (n=59). The primary end point was relapse of synovitis. In addition, joint circumference, pain, function, range of movement, and grip strength were followed up during six months.

Results: 24 relapses occurred in the orthoses group and 14 in the active group (p=0.056). The secondary measure showed no statistically significant differences between the groups.

Conclusion: The use of elastic wrist orthoses as a postinjection regimen does not improve the outcome of intra-articular glucocorticoid treatment for wrist synovitis. Results achieved in studies on knees should not be generalised to other joints, and postinjection recommendations should differ depending on the joint treated.

METHODS

Consecutive patients at the outpatient rheumatology departments in Gävle and Uppsala, fulfilling the 1987 American College of Rheumatology criteria for rheumatoid arthritis with signs and symptoms of wrist synovitis (heat, pain, tenderness, and swelling), were invited to participate in the study. Patients in functional class 4 according to Steinbrocker, patients with major hand deformities or planning hand surgery, patients with daily oral glucocorticoid treatment corresponding to more than 7.5 mg prednisone, and patients who had received an intra-articular glucocorticoid injection in the treated wrist in the past three months were excluded.

Patients gave their informed consent, and data on the characteristics of the patients were collected. Baseline disease activity was assessed by the erythrocyte sedimentation rate and the serum C reactive protein level, and general function by a Health Assessment Questionnaire (HAQ), slightly modified by Ekdahl and coworkers.

Joint circumference, grip strength, pain, function, and range of movement were measured. Table 1 indicates the measurement methods used.

All wrists were treated by the same doctor (TW) with 10 mg triamcinolone hexacetonide using the same injection procedure in all cases. The needle size used was 0.6×25 mm.

The treated joints were randomly allocated to 48 hours’ immobilisation in elastic wrist orthoses (Elcross Carpi Flexi, 25 mm.

Abbreviations: DMARDs, disease modifying antirheumatic drugs; HAQ, Health Assessment Questionnaire; PRWE, patient rated wrist evaluation.

**Table 1** Wrist measurement methods

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Method</th>
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<tbody>
<tr>
<td>Range of movement</td>
<td>The range of active motion, as measured between the fifth metacarpal bone and the forearm resting on a table by a Medema goniometer</td>
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<tr>
<td>Joint circumference</td>
<td>The wrist circumference just distal to the styloid process</td>
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<tr>
<td>Grip strength</td>
<td>Measured electronically with a Grippit instrument, with a peak value and a mean value of a 10 second force</td>
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<tr>
<td>Function</td>
<td>Self evaluation with a six question questionnaire, according to the patient rated wrist evaluation (PRWE). All answers were given on a 10 point scale and consequently the maximum score was 60</td>
</tr>
<tr>
<td>Pain</td>
<td>Self evaluation (five questions) according to PRWE, which means a maximum pain score of 50</td>
</tr>
</tbody>
</table>
Kaplan-Maier curve and a log rank test was used to calculate
used when appropriate. The relapse rates are shown as a
Duration of the therapeutic effect after glucocorticoid
could not have both wrists included in the study.
recurred. If so, the joint was re-examined and if wrist synovi-
departments if signs and symptoms from the treated wrist
measurements were also made after one week, three and six
months. The patients were told to contact the rheumatology
injection in the wrist with or without immobilisation in elastic wrist
and 43 patients, respectively.
A total of 117 patients were included in the study, and table
2 presents their characteristics. Both groups were treated dur-
during the observation period with disease modifying antirheu-
soft tissue treatment are mostly performed on knees. Con-
sequently, most knowledge of the method concerns synovitis
of the knee. Other joints have different construction and
function, and may therefore respond differently. Therefore, we
embarked on the present study to examine the effect of
immobilisation after intra-articular corticosteroid injection of the
wrist. A splint and a mitella would have provided the most
complete rest, but we chose 48 hour postinjection immobilisa-
tion after intra-articular corticosteroid injection treatment are mostly performed on knees. Con-
tinued with the standard deviation.
NS, not significant; SD, standard deviation.
* Mann-Whitney U test; † χ² test; ‡ Student’s t test.

## Table 2: Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>48 Hour orthoses immobilisation (n=58)</th>
<th>Normal activity (n=59)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age* (years), median (range)</td>
<td>61.5 (28–86)</td>
<td>61 (28–86)</td>
<td>NS</td>
</tr>
<tr>
<td>Sex† [male/female]</td>
<td>9/49</td>
<td>14/45</td>
<td>NS</td>
</tr>
<tr>
<td>Duration of disease* (years), median (range)</td>
<td>7 (0–38)</td>
<td>7 (0–63)</td>
<td>NS</td>
</tr>
<tr>
<td>DMARD treatment†</td>
<td>47</td>
<td>51</td>
<td>NS</td>
</tr>
<tr>
<td>Systemic corticosteroid treatment†</td>
<td>25</td>
<td>18</td>
<td>NS</td>
</tr>
<tr>
<td>Injection on dominant side†</td>
<td>35</td>
<td>37</td>
<td>NS</td>
</tr>
<tr>
<td>General function (HAQ†), median (range)</td>
<td>1.25 (0.13–2.75)</td>
<td>1.13 (0.13–2.23)</td>
<td>NS</td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate (mm/1st h)*, median (range)</td>
<td>35 (6–106)</td>
<td>32 (2–112)</td>
<td>NS</td>
</tr>
<tr>
<td>C reactive protein (mmol/l)*, median (range)</td>
<td>21 (5–220)</td>
<td>23 (5–192)</td>
<td>NS</td>
</tr>
<tr>
<td>Wrist pain (PRWE†), mean (SD)</td>
<td>32.7 (9.1)</td>
<td>31.4 (8.6)</td>
<td>NS</td>
</tr>
<tr>
<td>Wrist function (PRWE†), mean (SD)</td>
<td>38.4 (12.3)</td>
<td>35.7 (11.5)</td>
<td>NS</td>
</tr>
<tr>
<td>Wrist joint circumference (mm), mean (SD)</td>
<td>177.1 (16.1)</td>
<td>175.7 (15.1)</td>
<td>NS</td>
</tr>
<tr>
<td>Range of wrist movement [°], mean (SD)</td>
<td>82.9 (23.0)</td>
<td>85.8 (20.9)</td>
<td>NS</td>
</tr>
<tr>
<td>Grip strength max (N)*, median (range)</td>
<td>55 (0–326)</td>
<td>67 (25–206)</td>
<td>NS</td>
</tr>
<tr>
<td>Grip strength mean during 10 sec [N]*, median (range)</td>
<td>42 (0–283)</td>
<td>51 (14–183)</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS, not significant; SD, standard deviation.

Figure 1: Duration of the therapeutic effect after glucocorticoid injection in the wrist with or without immobilisation in elastic wrist
orthoses.

The result of this study is not consistent with the data
obtained after knee injections, and several possible explana-
tions for the discrepancy may be considered.
Firstly, loading and exercise are supposed to increase the glucocorticoid absorption and decrease the following local anti-inflammatory effect. In the knee, the loading-related absorption of the glucocorticoid should be much greater than in the non-weightbearing wrist.

Secondly, it has been suggested that the area of the inflamed synovium determines the degree of steroid resorption. As the wrist has a much smaller synovial surface than the knee, the glucocorticoid resorption should also be smaller in the wrist joint. The influence of immobilisation might therefore be of minor importance.

Furthermore, wrist movement may be important to spread the substance around the joint cavity and into connecting joints as well as tendon sheaths.

In summary, as the use of elastic orthoses after intra-articular glucocorticoid treatment for wrist synovitis does not improve the outcome, a routine of postinjection rest is not recommended. Because results obtained in studies on one specific joint cannot be generalised to other joints, further studies on different joints and their response to postinjection rest are needed. Such studies will lead to more adequate recommendations for postinjection treatment, which obviously should differ depending on the joint that is being treated.

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REFERENCES