IgM-rheumatoid factor and anti-cyclic citrullinated peptide decrease by 50% during intensive treatment in early rheumatoid arthritis

Decreases in rheumatoid factor (IgM-RF) during antirheumatic treatment are often reported, but the course of anti-cyclic citrullinated peptide (anti-CCP) is less conclusive, with some studies showing decrease, but others finding no change. As anti-CCP antibodies are very specific as a marker for rheumatoid arthritis (RA), decreases in anti-CCP levels on therapy may have prognostic relevance and guide further treatment decisions in patients with early RA.

A total of 21 patients with active, early RA were treated for 40 weeks with intensive conventional disease-modifying antirheumatic drug (DMARD) therapy, comprising hydroxychloroquine, sulfasalazine, methotrexate and tapered high-dose prednisolone (enhanced "COBRA" (Combination therapy Biji Reumaatoide Artritis trial) schedule, fig 1). On non-response at 8 weeks, methotrexate (MTX) was intensified to 25 mg/week; on non-response at 21 weeks, infliximab was offered to patients on high-dose MTX and MTX was intensified in the remainder. Serum was available for 18 out of 21 patients. IgM-RF and anti-CCP were measured and analysed at baseline and weeks 4, 8, 14, 21, 28, 32, 36 and 40. IgM-RF was measured by an in-house ELISA (positive at >5 AU/ml) and anti-CCP was measured using the anti-CCP2 ELISA (positive at >5 AU/ml). The Wilcoxon signed rank test was used to determine whether IgM-RF and anti-CCP at the different time points differed significantly from baseline.

The mean age of the 18 participants was 52 years (range: 29–76); 72% were women and their mean disease duration was 5 months. At baseline, 5 out of 18 patients were IgM-RF negative and 4 out of 18 were anti-CCP negative, resulting in available data of 13 patients for the IgM-RF analysis and 14 patients for the anti-CCP analysis. As previously reported, 90% of patients achieved 28-joint Disease Activity Score (DAS28) remission.

IgM-RF values decreased immediately by mean 58% in the first 8 weeks during prednisolone treatment and by 65% after 40 weeks (p<0.05, table 1). Of 13 patients, 8 received MTX intensification at 8 weeks and subsequently 4 received anti-TNF at 21 weeks; 77% of patients experienced a >50% reduction in IgM-RF after 40 weeks.

Similarly, anti-CCP antibody levels decreased significantly by 46% in the first 8 weeks and by 48% after 40 weeks (p<0.05) (fig 1). For two patients, anti-CCP antibody levels increased although RF decreased and they both achieved DAS28 remission. Of 14 patients, 9 received MTX intensification at 8 weeks and subsequently 5 received anti-TNF at 21 weeks. After 40 weeks of controlled treatment, 86% of patients experienced a >50% reduction in anti-CCP antibodies.

At 8 weeks, 6 out of 13 patients who were IgM-RF positive turned IgM-RF negative; at 40 weeks, 5 remained IgM-RF negative and 1 turned positive again. In contrast only 1 out of 14 patients who were anti-CCP positive turned negative at 21 weeks.

Table 1 28-Joint Disease Activity Score (DAS28), IgM-rheumatoid factor (RF) and anti-cyclic citrullinated protein (CCP) over 40 weeks of intensive treatment for all 18 patients

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>8 weeks</th>
<th>21 weeks</th>
<th>40 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAS28</td>
<td>5.2 (0.9)</td>
<td>5.2 (3.9–7.3)</td>
<td>2.3 (1.3)</td>
<td>2.4 (0.5–4.1)*</td>
</tr>
<tr>
<td>IgM-RF (U/ml)</td>
<td>190 (150)</td>
<td>49 (6–634)</td>
<td>52 (101)</td>
<td>24 (4–443)*</td>
</tr>
<tr>
<td>Anti-CCP (U/ml)</td>
<td>205 (227)</td>
<td>141 (0–850)</td>
<td>112 (137)</td>
<td>39 (0–454)*</td>
</tr>
</tbody>
</table>

*Significantly different from baseline (p<0.05) calculated using the Wilcoxon signed rank test.
Rapid decreases in IgM-RF have also been documented in the original COBRA trial\(^1\) and other studies\(^2–11\) but to our knowledge such profound decreases of anti-CCP during treatment of patients with early RA have not been described before.

As anti-CCP antibodies may have a pathogenic role in the development of RA, including anti-CCP levels in tight control strategies might increase the efficacy of such strategies in preventing damage and disability. Unfortunately, our study was too small and not designed to explore the relationship between change in disease activity and a fall in anti-CCP antibodies and RF.

This study strengthens the suggestion that intensive conventional treatment including initial high-dose prednisolone according to the COBRA schedule, and infliximab add-on where necessary, can lead to new levels of disease control in early RA.

**REFERENCES**

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