The matrix metalloproteinases (MMPs) belong to a large and increasing family of endopeptidases that are involved in the degradation of the ECM and are produced in inflammatory joint diseases such as RA by various cells represented in the synovial fluid (SF) and/or synovial tissue (1-3). Increased levels of various MMPs in the SF (i.e. MMP-1, -2, -3, -8, -9) (4-6) and synovial tissue (MMP-1, -13) (1,2) have been demonstrated in RA patients and have been suggested to reflect disease activity and joint destruction (4,6,7). MMP-8 and -9, which are almost exclusively found in RA, appeared to increase in the SF with progressions of RA (4). So far, studies on MMPs in PsA are sparse and have been limited to showing increased levels of MMP-1 in SF and synovial tissue (1). This study presents a comparison of the levels of MMP-9 in SF and serum from PsA patients (n = 28), RA patients (n = 28) and healthy controls (n = 6). Furthermore, the levels of MMP-9 in SF and serum were related to the number of leukocytes in the SF, the presence of radiological changes in the actual joint, and the erythrocyte sedimentation rate (ESR). The patients were matched for age (±14.5 years, mean ± SD) and disease duration (9.1 ± 10.2 years). Seven RA and PsA patients had early disease (<15 months) and 8 patients in each group had longstanding disease (>15 years). Five out of 18 RA patients and 4/17 PsA patients had the presence of radiological changes defined as Larsen score ≥ grade 2 (9). The total amount (pro and active forms) of MMP-9 in SF and serum was measured using an MMP-9 activity assay system (Amersham Pharmacia Biotech AB, Uppsala, Sweden) as previously described (10). Kruskal-Wallis, Mann-Whitney and Wilcoxon rank tests were used for the comparison of continuous data between groups and correlations were calculated by the Spearman rank correlation test.

The concentrations of MMP-9 in SF were significantly higher in patients with PsA and RA compared to controls (Table I). The observed increased levels of MMP-9 in RA are in line with other studies (4-6). However, due to methodological differences it is impossible to compare the absolute concentrations. The RA patients had higher concentrations of MMP-9 in SF compared to PsA patients, but the difference was not statistically significant. The concentration of MMP-9 in SF in early PsA (Md = 72.8, Q1-Q3 = 47.0-127.0) was decreased compared to longstanding PsA (Md = 115.2, Q1-Q3 = 59.8 - 172.2); however, this was not statistically significant and there was no difference between early or longstanding RA. In line with Ahrens et al. (6), there was a correlation between the levels of MMP-9 and the number of leukocytes in SF (r = 0.351, p = 0.0123) when the patient groups were combined. There were no differences in the levels of MMP-9 in the SF or serum between patients with or without visible radiological changes and no association with ESR. The levels of MMP-9 in serum were similar in all groups (Table I). Treatment with oral corticosteroids or DMARDs was not significantly associated with the levels of MMP-9 in SF or serum in any patient group.

In conclusion, in this study MMP-9 was increased in the SF from patients with PsA to the same extent as in RA. This implies that the potential destructive role of MMP-9 has similar prerequisites in PsA as in RA. We did not find any significant differences in MMP-levels over time, despite treatment, suggesting that the destruction of the joints is a continuous ongoing process.

Table I. The levels of MMP-9 in synovial fluid (SF) and serum, leukocytes in SF and ESR in patients with psoriatic arthritis (PsA) or rheumatoid arthritis (RA) and healthy controls. Kruskal-Wallis test was used for the between group comparisons. The values are presented as medians with the range between the first and third quartiles.

<table>
<thead>
<tr>
<th></th>
<th>Controls (n = 6)</th>
<th>PsA (n = 28)</th>
<th>RA (n = 28)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMP-9/SD, ng/mL</td>
<td>12.4 (8.0-16.8)</td>
<td>84.0 (53.6-134.4)</td>
<td>119.2 (71.8-201.0)</td>
<td>0.0004</td>
</tr>
<tr>
<td>Leukocytes x 10^9/L, SF</td>
<td>0.1 (0.1-1.0)</td>
<td>8.0 (4.0-12.3)</td>
<td>7.95 (5.1-12.7)</td>
<td>0.0031</td>
</tr>
<tr>
<td>MMP-9/serum, ng/mL</td>
<td>50.4 (39.2-73.6)</td>
<td>56.6 (47.2-79.6)</td>
<td>66.4 (41.0-88.0)</td>
<td>0.8164</td>
</tr>
<tr>
<td>ESR, mm/h</td>
<td>20 (10-40)</td>
<td>26 (16-52)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References


