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References


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Retrospective analysis of the role of serum vitamin D in early rheumatic disease

Sr, The role of vitamin D in rheumatic disease is of increasing interest. Although in vitro work implies an immunomodulatory function, its value as a therapy in autoimmune disease remains unproved [1]. Observational studies in established RA suggest an inverse association between vitamin D and composite DAS-28 [2–4], but data in early arthritis are lacking. We therefore investigated the relationship between serum vitamin D levels and clinical phenotype in patients with recent onset of joint pain. This work conforms to standards currently applied in the country of origin and was performed with the ethical approval of the Newcastle upon Tyne NHS Foundation Trust; all the patients provided written informed consent.

Consecutive, consenting patients with a range of rheumatological diagnoses, naïve to immunomodulatory drugs, were recruited from an early arthritis clinic in Newcastle upon Tyne, UK, between October 2007 and March 2009. Serum 25-hydroxy vitamin D [25(OH)D] levels (DiaSorin, Stillwater, MN automated immunoassay), CRP level and ESR were measured at inception, along with symptom duration, tender joint count, swollen joint count and patient-reported general global health score (GH-VAS). Statistical analyses were performed using IBM SPSS, Statistics 21, employing $\alpha=0.05$ as the significance threshold throughout.

Diagnostic categories (validated at the 1-year consultant rheumatologist follow-up) for 344 patients in the study cohort comprised RA, undifferentiated arthritis, other inflammatory arthritis (psoriatic, enteropathic), reactive arthritis, crystal arthritis, OA, and non-inflammatory arthralgia. Demographics and 25(OH)D measurements for these groups are summarized in Table 1.

Significant differences in age, sex and symptom duration, but not 25(OH)D levels, were seen between diagnostic groups (Kruskal–Wallis and $\chi^2$ test). There was no significant association between serum 25(OH)D and any of the clinical or laboratory parameters measured in the cohort as a whole, after correction for age, sex and symptom duration (linear regression). Within individual diagnostic categories, however, a clear inverse association between GH-VAS and 25(OH)D was observed in early OA patients ($P<0.001$ after correction for age, sex and symptom duration), which was not seen in early RA patients or any other diagnostic subgroup.

This is the first study to attempt to dissect the effects of 25(OH)D in early arthritis. Our observation of an inverse association between vitamin D status and perceived health only in OA patients is intriguing; it contrasts with published findings in established RA, where low vitamin D levels predicted high disease activity [2, 3]. Of the four components of DAS28, GH-VAS appears to be the most sensitive to vitamin D status in established RA [5] and may disproportionately influence the reported associations with DAS28. Degenerative joint disease is a frequent consequence of advancing RA and thus could affect perceived pain and, by the same token, perceived general health. Our findings are consistent with a scenario in which the apparent coupling of vitamin D status with DAS28 in RA in fact reflects the same primary association with perceived general health observed by us in early OA. Therefore, although the mechanism is not obvious, coexistent OA provides a possible explanation for the apparent discrepancy in effects of vitamin D in early vs established RA.

Given the paucity of literature examining the role of vitamin D in early arthritis, this study aimed to explore potential links between clinical parameters and serum vitamin D levels. We conclude that the previously described relationship between vitamin D status and disease activity in established RA is complex, and likely confounded by comorbidity, including secondary OA. We did not have...
Diagnostic categories include: UA: undifferentiated arthritis; NIA: non-inflammatory arthralgia including diagnoses such as FM or mechanical pain; Other IA: other inflammatory arthritis including diagnoses such as PsA; ReA: reactive arthritis such as parvovirus and CrA: crystal arthropathy. For each diagnostic category, patient demographics are displayed as well as median disease duration and median serum 25(OH)D levels. We demonstrate that there was no difference in baseline serum 25(OH)D levels between the diagnostic categories. However, there were statistically significant differences in age, sex and symptom duration as shown. Statistical analysis included Kruskal-Wallis test for continuous data and $\chi^2$ test for nominal data.

**Table 1** Demographic data of the diagnostic categories

<table>
<thead>
<tr>
<th>Diagnosis (n = 344 patients)</th>
<th>RA</th>
<th>UA</th>
<th>OA</th>
<th>NIA</th>
<th>Other IA</th>
<th>ReA</th>
<th>CrA</th>
<th>Significance between groups, $P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort, n (%)</td>
<td>73</td>
<td>40</td>
<td>58</td>
<td>89</td>
<td>50</td>
<td>14</td>
<td>19</td>
<td>—</td>
</tr>
<tr>
<td>Female:male ratio</td>
<td>(21)</td>
<td>(12)</td>
<td>(17)</td>
<td>(26)</td>
<td>(15)</td>
<td>(4)</td>
<td>(5)</td>
<td>—</td>
</tr>
<tr>
<td>Age, median (years)</td>
<td>49</td>
<td>46</td>
<td>55</td>
<td>42</td>
<td>46</td>
<td>44</td>
<td>61</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Symptom duration, median (weeks)</td>
<td>12</td>
<td>24</td>
<td>24</td>
<td>20</td>
<td>12</td>
<td>7</td>
<td>10</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Serum 25(OH)D, median (range), nmol/l</td>
<td>40</td>
<td>40.5</td>
<td>44</td>
<td>37</td>
<td>34</td>
<td>40</td>
<td>44</td>
<td>0.118</td>
</tr>
</tbody>
</table>

In contrast to established RA, vitamin D does not affect DAS28 in early RA.

**References**


