1, 25–dihydroxyvitamin D₃ decreases the proinflammatory interleukin 17 serum levels

Molnár I¹, Bohaty I², Somogyiné-Vári É¹

Immunoenocrinology and Osteoporosis Centre, EndoMed¹, and Regional Centre of Hungarian National Blood Transfusion Service², Debrecen, Hungary

**Background**

Th17 cells, which are involved in innate and adaptive immunity, produce IL-17A main cytokine. IL-17A leads to a local inflammation and bone wasting. The proinflammatory IL-17A cytokine is involved in cardiovascular diseases, osteoporosis and/or infertility (1).

1,25-dihydroxyvitamin D₃ as a pleiotropic hormone plays a crucial role in inflammatory and immune responses. Its receptor (VDR) is present on monocytes/macrophages, T and B lymphocytes, neutrophils and dendritic cells (2, 3).

The effect of vitamin D₃ on inflammatory cytokine and chemokine serum levels was studied.

**Patients and methods**

Proinflammatory cytokine and chemokine serum levels were investigated in 54 women (Table 1). IL-17A, monocyte chemoattractant protein-1 (MCP-1) and IL-6 proinflammatory cytokines were measured by enzyme linked immunosorbent assay (ELISA).

**Clinical parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>D₃-vitamin deficiency (n=18)</th>
<th>D₃-vitamin insufficiency (n=25)</th>
<th>D₃-vitamin sufficiency (n=11)</th>
<th>P-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>59±17</td>
<td>61±13</td>
<td>61±12</td>
<td></td>
</tr>
<tr>
<td>BMI* (kg/m²)</td>
<td>29±5</td>
<td>29±6</td>
<td>29±6</td>
<td></td>
</tr>
<tr>
<td>IL-17A (ng/ml)</td>
<td>16,84±6.06</td>
<td>35,08±15.79</td>
<td>68,95±244</td>
<td></td>
</tr>
<tr>
<td>VDR* (ng/ml)</td>
<td>13,35±2,9</td>
<td>12,07±2,61</td>
<td>11±1,9*</td>
<td>0.033</td>
</tr>
<tr>
<td>MCP-1* (ng/ml)</td>
<td>26,11±12,66</td>
<td>26,25±12,23</td>
<td>22,68±13,52</td>
<td></td>
</tr>
</tbody>
</table>

*Body mass index (BMI) **Monocyte chemoattractant protein-1 (MCP-1)

**Results**

1. Figure: IL-17A levels were significantly lower in women with 1,25-dihydroxyvitamin D₃ sufficiency.

2. Figure: IL-17A levels correlated inversely with vitamin D₃ serum levels.

3. Figure: IL-17A levels correlated inversely with monocyte chemoattractant protein 1 (MCP-1) serum levels.

4. Figure: IL-17A levels correlated inversely with IL-6 serum levels.

**Conclusions**

1,25-dihydroxyvitamin D₃ exerted inhibiting effect on proinflammatory cytokine (IL-17A and IL-6) serum levels.

Vitamin D₃ deficiency was associated with higher IL-17A serum levels highlighting its influencing role in diseases characterized by inflammatory events.

The strong correlation between IL-17A and MCP-1 or IL-6 serum levels suggested their implication in the initiation of local inflammation, such as in vascular damage leading to cardiovascular diseases besides their bone wasting effect.

The results supported that vitamin D₃ supplementation can help to limit the inflammatory processes caused damages (4).

**References**


ECG 2014. 05.3-7. Wroclaw, Poland
mol@endomed.hu