Vitamin D and COPD: seasonal variation is important

Janssens et al have demonstrated the relationship between vitamin D status and lung function in patients with chronic obstructive pulmonary disease (COPD). However, in their study there was only one assessment of vitamin D status per patient. Given the minimal component of diet to vitamin D status per patient, we assessed the variation of vitamin D status in healthy smokers.

In a study of 24 patients with COPD (mean (SD) age 69 (5.8) years and smoking history 43 (15.8) pack-years) with measurements undertaken in the same individuals at the end of summer (August/September) and winter (March/April), we have also shown that vitamin D status correlated with forced expiratory volume in 1 s (FEV₁) and vitamin D status was stronger in the winter (FEV₁: r = 0.451, p = 0.027; FVC: r = 0.367, p = 0.078) than in the summer (FEV₁: r = 0.399, p = 0.053; FVC: r = 0.264, p = 0.215). For spirometry there were non-significant seasonal trends with a mean difference of 0.05 l (95% CI -0.25 to 0.35) for FEV₁ and FVC, respectively (table 1).

Janssens et al showed that patients with COPD have poorer vitamin D status than healthy smokers. Our results confirmed this finding and, additionally, showed differences between the vitamin D status both in summer and winter compared with age, gender, body mass index and activity level. However, we also showed that the relationship between spirometry (FEV₁ and forced vital capacity (FVC)) and vitamin D status distance from the equator and therefore the sunlight exposure and has a seasonal variation in healthy individuals.

Furthermore, in the winter there were three subjects who had 25(OH)D concentrations >50 nmol/l but none with a concentration >75 nmol/l, a concentration regarded by many as being appropriate to define vitamin D sufficiency. In the summer, eight patients had a 25(OH)D concentration >50 nmol/l and only one patient had a concentration >75 nmol/l. We did not find any association between oily fish intake and vitamin D status.

Sunlight exposure is also determined by the distance from the equator and therefore the findings from one region may not represent those of another. In a study which evaluated the vitamin D status in patients with asthma compared with healthy controls (which showed no significant difference in status between these groups), the serum 25(OH)D concentration was twice as high in patients from Aberdeen (latitude 57°N) than in those from Norwich (latitude 52°N).

We therefore believe that assessing vitamin D status in a cross-sectional manner from one region may not provide a true picture of the burden of vitamin D deficiency in patients with COPD. However, we agree with the conclusion reached by Janssens et al that trials of vitamin D supplementation in COPD are required.

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Competing interests None.

Ethics approval This study was conducted with the approval of the Norfolk research ethics committee.

Provenance and peer review Not commissioned; not externally peer reviewed.

Accepted 28 January 2010

Thorax 2010; 65:1. doi:10.1136/thx.2009.134338

REFERENCES


Table 1 Mean (SD) values for summer and winter measurements

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Summer</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin D (nmol/l)</td>
<td>35.1 (10.5)</td>
<td>49.3 (13.0)</td>
<td>0.000</td>
</tr>
<tr>
<td>PTH (μg/l)</td>
<td>5.4 (1.7)</td>
<td>4.7 (1.6)</td>
<td>0.018</td>
</tr>
<tr>
<td>Calcium (mmol/l)</td>
<td>2.4 (0.1)</td>
<td>2.4 (0.1)</td>
<td>0.239</td>
</tr>
<tr>
<td>Corrected calcium (mmol/l)</td>
<td>2.4 (0.1)</td>
<td>2.4 (0.1)</td>
<td>0.375</td>
</tr>
<tr>
<td>FEV₁ (l)</td>
<td>1.18 (0.41)</td>
<td>1.23 (0.43)</td>
<td>0.121</td>
</tr>
<tr>
<td>FVC (l)</td>
<td>2.66 (0.66)</td>
<td>2.73 (0.72)</td>
<td>0.420</td>
</tr>
<tr>
<td>PEF (l/min)</td>
<td>205 (82)</td>
<td>214 (87)</td>
<td>0.650</td>
</tr>
</tbody>
</table>

There was a significant seasonal difference for vitamin D and parathyroid hormone. FEV₁, forced expiratory volume in 1 s; FVC, forced vital capacity; PEF, peak expiratory flow; PTH, parathyroid hormone.