No association between birth season and vitamin D concentration in adults in a North Norwegian population—the Tromsø study

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We found the associations in the article by Lippi et al. ‘Birth season and vitamin D concentration in adulthood’ very interesting (1). We therefore decided to look for the association between birth season and serum 25-hydroxyvitamin D [25(OH)D] levels in a comparable North Norwegian population of 10,203 subjects who participated in the Tromsø study in 2007-2008 (2). Since Tromsø is situated at 69 degrees north, there are significant seasonal variations of daylight with periods of polar night and day.

The subjects were divided into two season groups: the summer group with the ones born in April to September (when there is enough sunlight for vitamin D skin synthesis (3) and the winter group with the ones born in October to March. The groups were compared with the Chi-Square for categorical variables and the independent t-test for continuous variables without disclosing any significant differences, in particular regarding serum 25(OH)D (Table 1). Furthermore, in a logistic regression model with adjustment for sex, age and month of blood sampling [which as expected was a significant predictor of serum 25(OH)D], there was no increased risk of vitamin D deficiency [serum 25(OH)D <50 nmol/L] in those born during the winter months as compared to born during the summer months (Table 1). And finally, when looking at individual birth months there were no apparent differences between the seasons (Figure 1).

In conclusion, in a North Norwegian setting with great differences in sunlight between the winter and summer seasons, month of birth had no relation to later serum 25(OH)D levels. One explanation for the discrepancy with the findings of Lippi et al. may be that the putative effect on future serum 25(OH)D levels were due to the mothers’ vitamin D status. If so, the Norwegian habit of taking cod liver oil during the winter months, in particular during pregnancy, might have masked the effect of the vitamin D

Table 1 Daylight, age, sex, and serum 25(OH)D values according to the season of birth: the Tromsø study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Summer season (Apr-Sep)</th>
<th>Winter season (Oct-Mar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>5,494</td>
<td>4,709</td>
</tr>
<tr>
<td>Daylight (mean), h</td>
<td>19.6*</td>
<td>5.6</td>
</tr>
<tr>
<td>Age (mean), years</td>
<td>61.9 (11.9)</td>
<td>61.1 (11.6)</td>
</tr>
<tr>
<td>Sex (% of females)</td>
<td>2,959 (54.0)</td>
<td>2,534 (54.0)</td>
</tr>
<tr>
<td>Serum 25(OH)D, mean (SD), nmol/L</td>
<td>58.2 (19.2)**</td>
<td>58.1 (19.1)</td>
</tr>
<tr>
<td>No. of subjects with serum 25(OH)D &lt;50 nmol/L (%)</td>
<td>1,944 (35.4)</td>
<td>1,663 (35.3)</td>
</tr>
<tr>
<td>OR† (95% CI) for serum 25(OH)D &lt;50 nmol/L with summer season as reference</td>
<td>–</td>
<td>1.00 (0.92-1.08)</td>
</tr>
</tbody>
</table>

*, P<0.01; **, P<0.05; †, adjusted for age, sex and month of blood sampling.
Also, in Norway there has been a strong tradition of vitamin D supplementation to infants which might also have masked seasonal variations in sun exposure. And finally, the blood samples in the study of Lippi et al. (as in our study) were collected throughout the whole year (January-December), and as the serum 25(OH)D levels are higher during the summer months, the discrepancy might also be due to the lack of adjusting for month of sampling in the study by Lippi et al.

In conclusion, in a North Norwegian setting with great differences in sunlight between the winter and summer seasons, month of birth had no relation to later serum 25(OH)D levels. The effect of month of birth in this regard is still unsettled.

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Footnote
Conflicts of Interest: The authors have no conflicts of interest to declare.

References