

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

Ieva Zostautiene^{1,2}, Rolf Jorde^{1,2}, Guri Grimnes^{1,2}

¹Tromsø Endocrine Research Group, Department of Clinical Medicine, UiT The Arctic University of Norway, Tromsø, Norway; ²Division of Internal Medicine, University Hospital of North Norway, Tromsø, Norway

Correspondence to: Ieva Zostautiene, PhD. Tromsø Endocrine Research Group, Department of Clinical Medicine, UiT The Arctic University of Norway, Tromsø, Norway. Email: ieva.zostautiene@unn.no.

Submitted Nov 24, 2015. Accepted for publication Dec 02, 2015.

doi: 10.3978/j.issn.2305-5839.2015.12.54

View this article at: <http://dx.doi.org/10.3978/j.issn.2305-5839.2015.12.54>

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

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

*, P<0.01; **, P<0.05; †, adjusted for age, sex and month of blood sampling.

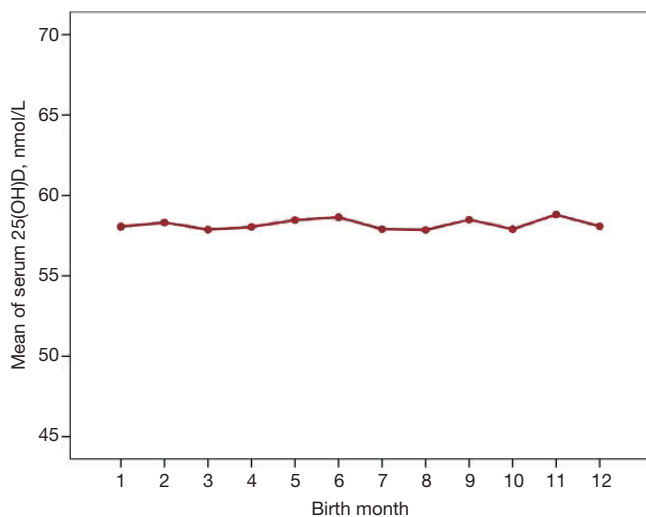


Figure 1 Mean serum 25-hydroxyvitamin D levels according to the month of birth (1, January; 2, February etc.): the Tromsø study.

winter. 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.

Acknowledgements

None.

Footnote

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

References

1. Lippi G, Bonelli P, Buonocore R, et al. Birth season and vitamin D concentration in adulthood. *Ann Transl Med* 2015;3:231.
2. Jacobsen BK, Eggen AE, Mathiesen EB, et al. Cohort profile: the Tromsø study. *Int J Epidemiol* 2012;41:961–7.
3. Engelsen O, Brustad M, Aksnes L, et al. Daily duration of vitamin D synthesis in human skin with relation to latitude, total ozone, altitude, ground cover, aerosols and cloud thickness. *Photochem Photobiol* 2005;81:1287–90.

Cite this article as: Zostautiene I, Jorde R, Grimnes G. No association between birth season and vitamin D concentration in adults in a North Norwegian population—the Tromsø study. *Ann Transl Med* 2016;4(1):20. doi: 10.3978/j.issn.2305-5839.2015.12.54