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No secular trend in vitamin D levels over the past 30 years in Swedish children

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Aim

We hypothesized that the increased indoor activities and obesity in recent years would contribute to decreased vitamin D levels in children and adolescents. The present study provided long-term follow-up of vitamin D levels in a large group of children referred over 30 years for growth evaluation.

Background

The importance of vitamin D for skeletal health is well established and many recent reports indicate that vitamin D deficiency is linked to chronic diseases. Vitamin D status is defined by serum 25-hydroxyvitamin D (25(OH)D), and although there is no consensus on optimal levels of 25(OH)D concentrations of 50 nmol/L (20 ng/mL) meet the requirements in 97.5% of the population. Sunlight is limited in Sweden (latitude 55–69) during October–March resulting in a marked seasonal variation[1]. Supplementation is recommended in Sweden during infancy.

Conclusions

- No secular trend in vitamin D levels was found in this unique study over 30 years in more than 2000 Swedish children.
- These results broaden our understanding of the public health relevance of vitamin D and could be of value for future cost–benefit analyses in preventive healthcare.

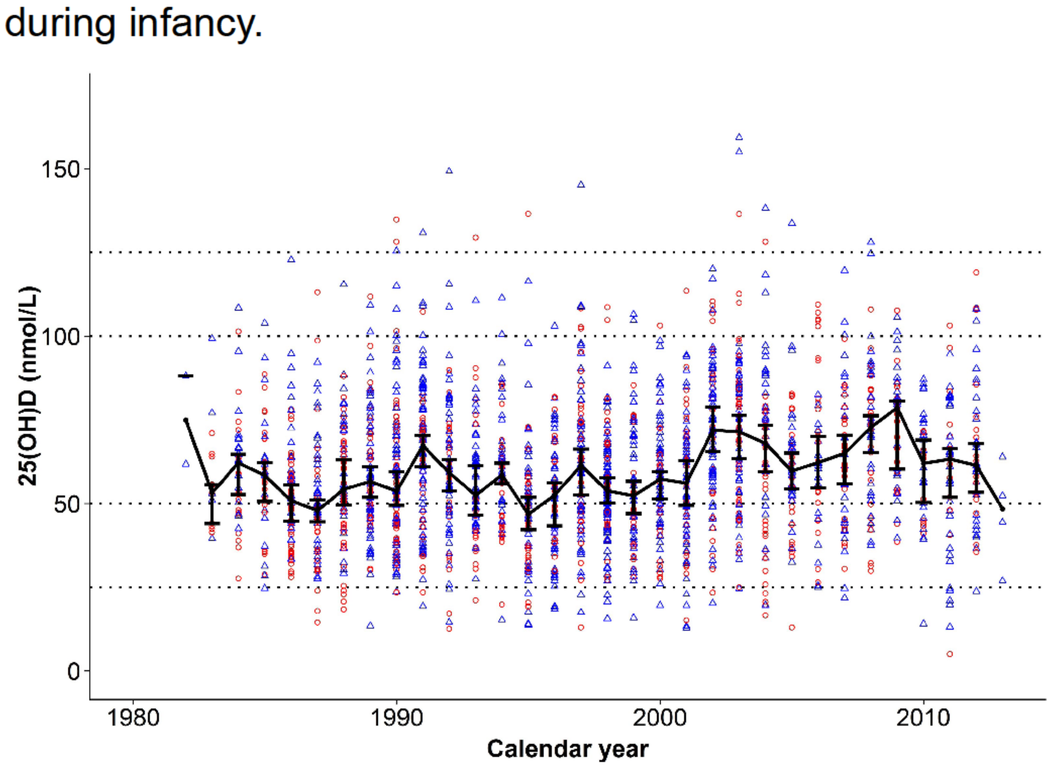

Figure 1. Calendar years, 1982-2013, versus 25(OH)D levels. Median (black line) ± 95% confidence intervals (for each year) are shown in 2048 Swedish children, 1197 boys (blue triangels) and 851 girls (red circles). Black dashed horizontal lines represent 25(OH)D levels at 25, 50, 100 and 125 nmol/L.

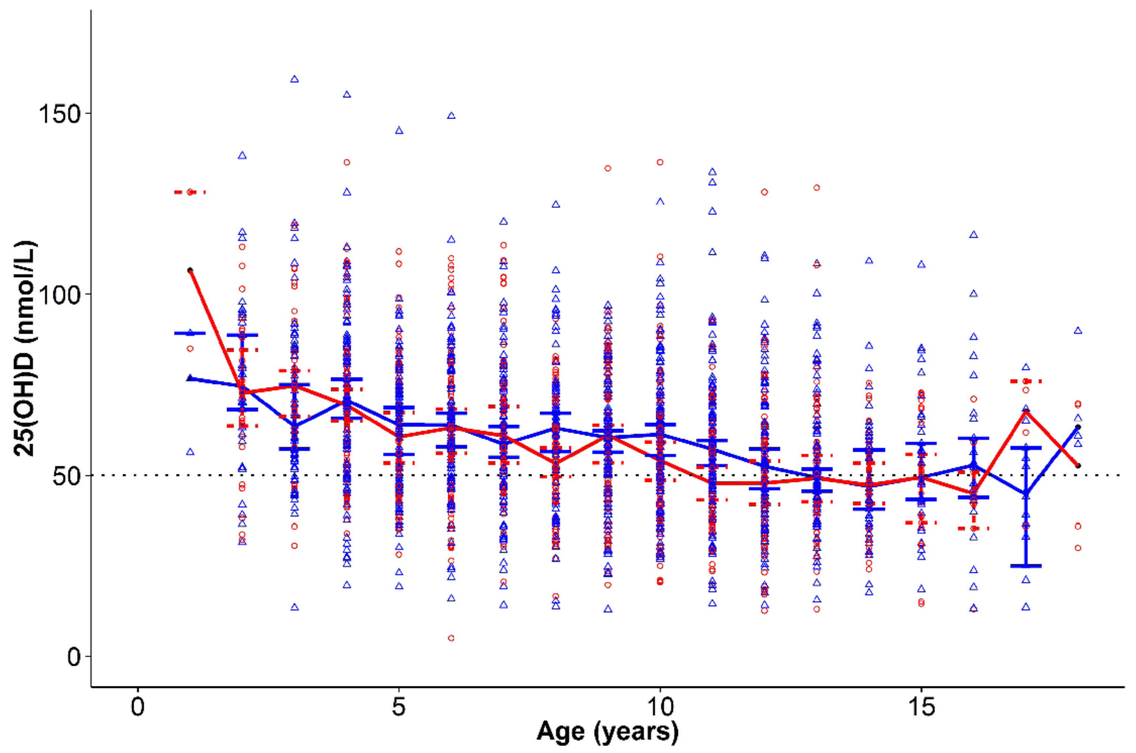

Figure 2 Age versus 25(OH)D levels. Data represent median ± 95% confidence interval for 1197 boys (blue line; squares) and 851 girls (red line; circles). There was a significant decreasing trend with age (p<0.00001). Black dashed horizontal lines represent the recommended 25(OH)D level 50 nmol/L.

Patients and Methods

Serum 25(OH)D was analysed between 1982-2013 at GP-GRC from 2048 Swedish children (mean age ± SD, 8.59 ± 3.68 years; 1197 boys). 25(OH)D was determined with the IDS-iSYS 25-Hydroxy Vitamin DS automated chemiluminescence immunoassay[1]. Studies of decades-old sera have revealed that 25(OH)D is stable.

Results

No trend for decreased vitamin D levels over time was found, with median 25(OH)D levels of 58.4 nmol/L, 95% CI 29.0–96.3 (Figure 1). We found a significant association with age, i.e., younger children had higher 25(OH)D levels, possibly due to the general supplementation of vitamin D recommended for Swedish infants (Figure 2).
Above 125 nmol/L, n=15 (1%);
100-125 nmol/L, n=68 (3%);
75-99 nmol/L, n=377 (18%);
50-74 nmol/L, 884 (43%),
25-49 nmol/L, n= 641 (31%);
below 25 nmol/L, n=63 (3%).

References:
1. Andersson B, et al, *J Endo Investigation* 2015. [Epub ahead of print]
2. Ross, AC, et al. *J Clin Endo Metab*, 2011; 96:53-58.

Presented at ESPE 2015, Barcelona, Spain.

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ESPE 2015 14--P1
Bone, Growth Plate and Mineral Metabolism
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DOI: 10.3252/pso.eu.54espe.2015
Poster presented at: ESPE 2015 BARCELONA