Vitamin D status is associated with cardiometabolic markers in 8-11-year-old children, independently of body fat and physical activity

Vitamin D status has been associated with cardiometabolic markers even in children, but the associations may be confounded by fat mass and physical activity behaviour. This study investigated associations between vitamin D status and cardiometabolic risk profile, as well as the impact of fat mass and physical activity in Danish 8-11-year-old children, using baseline data from 782 children participating in the Optimal well-being, development and health for Danish children through a healthy New Nordic Diet (OPUS) School Meal Study. We assessed vitamin D status as serum 25-hydroxyvitamin D (25(OH)D) and measured blood pressure, fasting plasma glucose, homoeostasis model of assessment-insulin resistance, plasma lipids, inflammatory markers, anthropometry and fat mass by dual-energy X-ray absorptiometry, and physical activity by 7 d accelerometry during August-November. Mean serum 25(OH)D was 60·8 (sd 18·7) nmol/l. Each 10 mmol/l 25(OH)D increase was associated with lower diastolic blood pressure (-0·3 mmHg, 95 % CI -0·6, -0·0) (P=0·02), total cholesterol (-0·07 mmol/l, 95 % CI -0·10, -0·05), LDL-cholesterol (-0·05 mmol/l, 95 % CI -0·08, -0·03), TAG (-0·02 mmol/l, 95 % CI -0·03, -0·01) (P≤0·001 for all lipids) and lower metabolic syndrome (MetS) score (P=0·01). Adjustment for fat mass index did not change the associations, but the association with blood pressure became borderline significant after adjustment for physical activity (P=0·06). In conclusion, vitamin D status was negatively associated with blood pressure, plasma lipids and a MetS score in Danish school children with low prevalence of vitamin D deficiency, and apart from blood pressure the associations were independent of body fat and physical activity. The potential underlying cause-effect relationship and possible long-term implications should be investigated in randomised controlled trials.

General information
State: Published
Organisations: National Food Institute, Research group for Risk Benefit, University of Copenhagen, Aalborg University
Number of pages: 9
Pages: 1647-1655
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: British Journal of Nutrition
Volume: 114
Issue number: 10
ISSN (Print): 0007-1145
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.65 SJR 1.756 SNIP 1.555
Web of Science (2017): Impact factor 4.586
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.46 SJR 2.055 SNIP 1.535
Web of Science (2016): Impact factor 4.844
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.52 SJR 1.583 SNIP 1.442
Web of Science (2015): Impact factor 4.051
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.18 SJR 1.532 SNIP 1.273
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.61 SJR 2.746 SNIP 2.479
Web of Science (2013): Impact factor 3.861
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes