

Vitamin D during pregnancy in relation to childhood growth, overweight and obesity

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i hörsal Arvid Carlsson, Medicinaregatan 3, den 12 juni, klockan 9.00

av Anna Amberntsson

Fakultetsopponent:

Berit Lilienthal Heitmann, professor

Bispebjerg and Frederiksberg Hospital, The Capital Region of Denmark
& The University of Copenhagen, Denmark

Avhandlingen baseras på följande delarbeten

- I. Amberntsson A, Bärebring L, Winkvist A, Lissner L, Meltzer HM, Brantsæter AL, Papadopoulou E, Augustin H. *Vitamin D intake and determinants of vitamin D status during pregnancy in the Norwegian Mother, Father and Child Cohort Study*. Under review.
- II. Amberntsson A, Papadopoulou E, Winkvist A, Lissner L, Meltzer HM, Brantsæter AL, Augustin H. *Maternal vitamin D intake and BMI during pregnancy in relation to child's growth and weight status from birth to 8 years: a large national cohort study*. *BMJ Open*. 2021 Oct 1;11(10):e048980.
- III. Amberntsson A, Bärebring L, Winkvist A, Lissner L, Meltzer HM, Brantsæter AL, Papadopoulou E, Augustin H. *Maternal vitamin D status in relation to infant BMI growth trajectories up to 2 years of age in two prospective pregnancy cohorts*. *Obes Sci Pract*. 2022 Apr 8;8(5):670-681.
- IV. Amberntsson A, Bärebring L, Winkvist A, Lissner L, Meltzer HM, Brantsæter AL, Papadopoulou E, Augustin H. *Maternal vitamin D status and risk of childhood overweight at 5 years of age in two Nordic cohort studies*. Under review.

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR MEDICIN**



Vitamin D during pregnancy in relation to childhood growth, overweight and obesity

Anna Amberntsson

Department of Internal Medicine and Clinical Nutrition, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, Sweden, 23.

Abstract

The aim of this thesis is to investigate the association between maternal vitamin D intake and status in pregnancy and the child's growth and risk of overweight and obesity in childhood. Data from the Norwegian Mother, Father and Child Cohort Study (MoBa) and the Swedish GraviD study were used in **Paper I-IV** and **Paper III-IV**, respectively.

Paper I include investigations of vitamin D status and its determinants, and vitamin D intake. Overall, 48% of women had vitamin D insufficiency and 61% had a vitamin D intake below the recommended 10 µg/day. Higher vitamin D status was associated with higher vitamin D intake, blood sampling between spring to autumn, use of solarium, higher education and age, origin from high income country, lower pre-pregnancy body mass index (BMI), and not smoking during pregnancy. In **Paper II**, we investigated the associations between maternal vitamin D intake and childhood growth and risk of overweight from birth up to 8 years. Among mothers with normal pre-pregnancy BMI, a vitamin D intake $\geq 10\mu\text{g/day}$ was associated with lower weight growth trajectories during infancy and with child overweight in preschool years. The results indicated associations in opposing directions in children of mothers with pre-pregnancy overweight or obesity. In **Paper III**, we investigated the association between maternal vitamin D status and classes of infant BMI growth trajectories up to 2 years of age. Lower maternal vitamin D status was associated with a higher BMI growth trajectory class during the first 2 years of life in MoBa, but not in GraviD. In **Paper IV**, we investigated the association between maternal vitamin D status and the child's BMI and risk for overweight at 5 years of age. Low maternal vitamin D status was associated with lower childhood BMI, but not with overweight.

Compilation of the scientific literature indicate that maternal vitamin D intake and status during pregnancy may play a role in childhood growth and risk of overweight or obesity. However, there is not sufficient evidence to conclude if the associations are causal. If there is a causal effect of maternal vitamin D status on childhood growth or risk of overweight and obesity, it is likely small and with no clinically important effect.

Keywords: Vitamin D, 25OHD, pregnancy, child, growth, overweight

ISBN: 978-91-8069-177-2 (TRYCK)

<http://hdl.handle.net/2077/75215>

ISBN: 978-91-8069-178-9 (PDF)