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Maternal vitamin D intake during pregnancy increases gene expression of ILT3 and ILT4 in cord blood.

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Abstract

Background

Recent studies indicate that prenatal vitamin D intake may protect against the development of atopic diseases in young children. Vitamin D has been shown to induce tolerogenic antigen-presenting cells such as dendritic cells. Whether the allergy-protective potential of prenatal vitamin D is mediated through such mechanisms is, however, unknown.

Objective

To evaluate the association between prenatal vitamin D supplementation and tolerogenic antigen-presenting cells in cord blood (CB) as determined by mRNA measurement of immunoglobulin-like transcripts (ILT)3 and ILT4.

Methods

A prospective multi-centre birth cohort was established in rural areas of five European countries. Information on maternal exposures including vitamin D intake was collected by questionnaires during pregnancy. The gene expression of ILT3 and ILT4 was analysed by real-time PCR in the CB of 927 children. Maternal vitamin D supplementation was assessed in Finland and France (n=349).

Results

Maternal vitamin D supplementation during pregnancy was associated with an increase in the gene expression of ILT3 (P=0.012) and ILT4 (P<0.001). This association remained significant for ILT4 (P=0.020) and showed a positive trend for the gene expression of ILT3 (P=0.059) after multivariate analysis controlling for various confounders.

Conclusions

Vitamin D supplementation during pregnancy may increase the mRNA levels of ILT3 and ILT4 in CB. This finding may point towards an early induction of tolerogenic immune responses by maternal vitamin D intake.

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