Vitamin D in Pregnancy

Effects of vitamin D in pregnancy on maternal and offspring health-related outcomes: an umbrella review of systematic review and meta-analyses

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Maternal vitamin D status has been increasingly investigated for its potential influence on pregnancy outcomes and offspring health, extending beyond its established role in skeletal development.

This umbrella review, incorporating 16 systematic reviews and meta-analyses involving 250,569 women, examined associations between maternal vitamin D status, prenatal supplementation and maternal and offspring health outcomes.

Maternal vitamin D deficiency was associated with increased risks of preterm birth, low birthweight, recurrent miscarriage, gestational diabetes and bacterial vaginosis.

Vitamin D supplementation was also associated with improvements in selected outcomes,including reduced risks of pre-eclampsia, miscarriage and foetal or neonatal mortality, alongside potential benefits for offspring neurodevelopment.

However, all included meta-analyses were rated as having critically low methodological quality, highlighting substantial uncertainty in the reliability of the findings. The review reinforces the potential importance of maternal vitamin D status while emphasising the need for more rigorous research to establish whether supplementation consistently improves pregnancy and long-term offspring outcomes. ■



High-Dose Vitamin D3 Supplementation During Pregnancy and Test-Based Cognitive Performance at Age 10 Years: a Post Hoc Secondary Analysis of a Randomized Clinical Trial.

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JOURNAL: JAMA NETWORK OPEN 2026;9(5):E2611464

Childhood cognitive development is an important predictor of cognitive function and socioeconomic outcomes later in life. Although strongly influenced by genetics, prenatal nutritional exposures, including maternal vitamin D status, may contribute to neurodevelopment. Evidence linking maternal vitamin D supplementation during pregnancy with cognitive outcomes in offspring is inconsistent. This post hoc secondary analysis of the Copenhagen Prospective Studies on Asthma in Childhood 2010 (COPSAC) randomised control trial aimed to assess whether high dose vitamin D3 supplementation during pregnancy is associated with improved offspring cognition at 10 years. Positive associations between high-dose vitamin D3 verbal memory, and visual memory were seen. It was concluded that prenatal vitamin D supplementation may have a potential role in offspring cognitive development, however further research is needed to confirm effects. ■

Vitamin D supplementation for women during pregnancy

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JOURNAL: THE COCHRANE DATABASE OF SYSTEMATIC REVIEWS 2024;7(7):CD008873

Vitamin D supplementation during pregnancy has attracted considerable interest for its potential to improve maternal and neonatal health outcomes, including reducing the risks of pre-eclampsia, gestational diabetes, preterm birth and low birthweight. However, concerns surround the reliability of the evidence to support this strategy. This updated Cochrane systematic review, comprising 8 studies involving 2,313 women, evaluated the effectiveness and safety of vitamin D supplementation, either alone or in combination with calcium and other micronutrients, on maternal and neonatal health outcomes.

The findings revealed considerable uncertainty regarding the effects of vitamin D supplementation on pre-eclampsia, gestational diabetes, preterm birth and maternal kidney complications. Similarly, evidence for supplementation combined with calcium or other micronutrients remained highly uncertain. The authors concluded that there is currently insufficient reliable evidence to establish whether vitamin D supplementation improves the maternal and neonatal health outcomes investigated. ■

Vitamin D Deficiency During Pregnancy Is Associated With Greater LDL-C Increase, Elevated β-Hydroxybutyrate and Altered Neonatal Metabolic Markers-A Secondary, Pooled Analysis of the Randomized, Controlled Vitamin D and Lifestyle for Gestational Diabetes Prevention Trial (DALI)

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JOURNAL: ENDOCRINOLOGY, DIABETES & METABOLISM 2026;9(5):E70258

Vitamin D deficiency is common during pregnancy, particularly in women with overweight or obesity, and has been linked to gestational diabetes and adverse lipid profiles. This secondary analysis of 962 overweight/obese pregnant women from the larger vitamin D and Lifestyle Intervention for Gestational Diabetes Mellitus Prevention (DALI) trial investigated whether early pregnancy vitamin D status (before 20 weeks) influences maternal lipid metabolism and metabolic markers in newborns, potentially highlighting a role for vitamin D beyond bone health.

Women with vitamin D deficiency had larger increases in low-density lipoprotein cholesterol throughout pregnancy, and the ketone body, β-OH butyrate at 24-28 weeks gestation. Higher ketone body levels were observed in the cord blood of the offspring of mothers with vitamin D deficiency indicating that metabolic alterations may extend into the foetal environment. It was concluded that vitamin D deficiency before 20 weeks gestation may aid identification of women and their offspring at risk of metabolic changes throughout pregnancy. ■

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