

Study finds that maternal vitamin D levels in pregnancy do not affect children's bone health

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A study of nearly 4,000 pairs of mothers and their children in the Children of the '90s study at the University of Bristol has shown that maternal vitamin D levels during pregnancy are not associated with the child's bone health in later life.

The research, published Online First in *The Lancet*, is the largest ever observational study of the effects of mothers' vitamin D levels in [pregnancy](#) on their children's [bone health](#), and suggests that UK health guidelines may be overstating the importance of vitamin D supplementation in pregnancy.

The study, led by Professor Debbie Lawlor of the University of Bristol, assessed vitamin D levels in 3960 [pregnant women](#), recording data from all three trimesters. When their children had reached an average age of nine years and 11 months, their [bone mineral content](#) (BMC) was assessed using dual-energy X-ray [absorptiometry](#). BMC is a measure of bone health, where a lower mineral content is associated with poorer bone health and higher risk of diseases such as rickets.

The researchers found no significant association between a mother's vitamin D levels and their child's BMC. Mothers' vitamin D levels were on average lowest during their [first trimester](#), and then increased as the pregnancy progressed; as expected, levels were higher when measured during summer months and lower when measured during winter months.

Furthermore, although non-white mothers and those who smoked during pregnancy tended to have lower vitamin D levels overall, this appeared to have no effect on their children's bone health.

Vitamin D helps to keep a person's bones and teeth healthy by regulating the amount of calcium and phosphate in the body, and it has been thought that as well as affecting maternal bone health, low levels of vitamin D during pregnancy might lead to problems with the baby's [bone formation](#). Aside from dietary sources of vitamin D, which include oily fish, eggs, and meat, vitamin D is produced naturally in the body by the action of sunlight on skin. However, in recent years, concerns have been raised over possible adverse effects of low levels of vitamin D in pregnancy, leading NICE guidelines to recommend in 2008 that all pregnant and breastfeeding women should take a 10 microgram vitamin D supplement every day.

Results of previous studies into the effects of maternal vitamin D levels on children's bone health have been inconclusive, but the current study is more than ten times larger than previous studies combined. While there have been no randomised controlled trials of the effect of vitamin D supplementation during pregnancy on children's bone health, the current study appears to suggest that UK guidelines may be overstating the need to take vitamin D supplements during pregnancy in order to improve the child's future bone health.

Speaking to Lancet TV, Professor Lawlor said that "Current guidelines are relatively vague, in that what they say is that all pregnant women should be made aware that in pregnancy, vitamin D levels can be low, and that it's important for the mother's health and for the child's health."* Given uncertain evidence for the effects of maternal vitamin D on bone health, Professor Lawlor suggests that the guidelines may be "over-emphasising the importance of vitamin D, and we need more evidence... Suggesting to pregnant women that their child's future bone

health depends on their pregnancy vitamin D status or that by taking supplements they will improve [their child's future bone health], ... I think our study challenges that [suggestion]."*

According to Professor Lawlor, "We believe that there is no strong evidence that pregnant women should receive vitamin D supplementation to prevent low BMC in their offspring, although we cannot comment on other possible effects of vitamin D in pregnant women. While excessive vitamin D intake can affect the body's calcium balance and result in cardiac arrhythmias and muscle problems (both rare) as well as milder problems such as dry mouth and constipation, our study didn't look at any other potential beneficial or adverse effects of vitamin D supplementation, besides the association with children's bone health."**

In a linked Comment, Professor Philip Steer of Imperial College London, UK, adds that "In view of the inconsistency in results [of previous studies], it might seem unclear why vitamin D supplementation is officially recommended for all pregnant and breastfeeding women." He adds that, "The safest approach is probably routinely to supplement pregnant women at greatest risk, as defined by the NICE guidelines: women of south Asian, black African, black Caribbean, or Middle Eastern origin, women who have limited exposure to sunlight (eg, those who are predominantly housebound or are generally fully covered when outdoors), women who eat a diet particularly low in vitamin D (eg, no [oily fish](#), eggs, meat, or [vitamin D](#)-fortified margarine or breakfast cereal), and women with a body-mass index higher than 30 kg/m² before pregnancy. For other women, the optimum approach is unclear, and long-term randomised trials of supplementation are justified."

More information: [www.thelancet.com/journals/lan... \(12\)62203-X/abstract](http://www.thelancet.com/journals/lan... (12)62203-X/abstract)

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