

Low vitamin D levels during pregnancy associated with preterm birth in non-white mothers

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African-American and Puerto Rican women who have low levels of vitamin D during pregnancy are more likely to go into labor early and give birth to preterm babies, research led by the University of Pittsburgh Graduate School of Public Health reveals. The study, the largest to date to look at the association between vitamin D and preterm birth, is now available online in the *American Journal of Epidemiology*.

"Vitamin D is unique in that while we get it from our diets, our primary source is our body making it from sunlight," said lead author Lisa Bodnar, Ph.D., M.P.H., R.D., associate professor in Pitt Public Health's Department of Epidemiology. "Previous studies using conservative definitions for vitamin D deficiency have found that nearly half of black women and about 5 percent of [white women](#) in the United States have vitamin D concentrations that are too low."

Among non-white mothers, the incidence of spontaneous, preterm birth – naturally going into labor two or more weeks before the 37 weeks of pregnancy considered full-term – decreased by as much as 30 percent as vitamin D levels in the blood increased.

Dr. Bodnar and her co-authors, whose work was funded by the National Institutes of Health, did not find a similar relationship between maternal vitamin D levels and preterm birth in white women.

"We were concerned that finding this association only in non-white women meant that other factors we did not measure accounted for the link between low vitamin D levels and spontaneous preterm birth in black and Puerto Rican mothers," said Dr. Bodnar. She and her co-authors used methods to account for the expected influence of discrimination and socioeconomic position, as well as fish intake and physical activity. "Even after applying these methods, vitamin D deficiency remained associated with spontaneous preterm birth."

"Preterm birth is the most important problem in modern obstetrics," said senior author Hyagriv N. Simhan, M.D., M.S., chief of the division of maternal-fetal medicine and medical director of obstetrical services at Magee-Womens Hospital of UPMC. "In 2010, over 1 million infants born preterm at less than 37 weeks gestation died worldwide. Preterm infants who survive are at risk of chronic lung disease, deafness, blindness or other visual impairment, and learning and cognitive disability."

A novel part of the study was the availability of information from placental examinations. The researchers found that vitamin D deficiency was most strongly related to preterm births with damage to the placenta caused by inflammation.

"This finding may give us insight into the biology connecting low vitamin D and preterm birth," Dr. Simhan said. "It holds great promise and will motivate significant preterm birth research."

The researchers used a sample of over 700 cases of preterm birth and 2,600 full-term births collected by the Collaborative Perinatal Project, which was conducted in 12 U.S. medical centers from 1959 to 1965. The blood samples collected by the project were well-preserved and able to be tested for vitamin D levels 40 years later.

"It is critical to repeat this study in a modern sample," said Dr. Bodnar, noting that pregnant [women](#) today smoke less, have less sun-exposure and receive more vitamin D in their foods than the mid-century cohort. "Further, it is especially important to understand how vitamin D influences preterm birth among black mothers. Vitamin D supplementation could be an easy way to reduce the high rates of [preterm birth](#) in this group."

Provided by University of Pittsburgh Schools of the Health Sciences

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