

Vast majority of poor, urban women don't use prenatal vitamins before pregnancy, study shows

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A study of more than 7,000 low-income, urban mothers enrolled in the Boston Birth Cohort found that fewer than 5 percent of them started folic acid supplementation and used it almost daily before pregnancy, a

widely recommended public health measure designed to prevent potentially crippling birth defects.

A report of the findings was published on April 19 in the *American Journal of Public Health*.

"The findings are concerning because they show that public [health](#) interventions aren't always effective in reaching vulnerable populations who need them the most," says Tina Cheng, M.D., M.P.H., co-director of Johns Hopkins Children's Center and the study's lead author.

Numerous studies have shown that prepregnancy use of prenatal vitamins containing folic acid can prevent 50 to 70 percent of neural tube defects. Since 1992, the United States Public Health Service has recommended all women of reproductive age take folic acid supplementation.

Development of the neural tube is completed about 28 days postconception, Cheng notes, often before a woman's aware she is pregnant, and because nearly half of all U.S. pregnancies are unintended, it's important for all women of reproductive age to routinely take folic acid supplementation. Prenatal vitamin [supplements](#) sold over the counter cost about 30 cents a day.

To better understand the pattern of prenatal vitamin supplementation and the blood levels of [folate](#) (a biomarker of circulating folate nutrition status) in U.S. high-risk populations, Cheng and her colleagues focused on a group of 8,494 mother-infant pairs recruited into the Boston Birth Cohort between 1998 and June 2014 at the Boston Medical Center.

For the purposes of their analysis, the researchers looked only at data for women with single, live births without major birth defects, which narrowed the study population to 7,612 [mothers](#). The study included

3,829 black and 2,203 Hispanic mothers. Of these, 2,633 (34.6 percent) were married; 2,692 (35.4 percent) had a college education; 870 (11.4 percent) smoked; 643 (8.5 percent) reported using alcohol; and 3,845 (50.5 percent) said their pregnancy was planned.

All women had reported their use of folic acid supplementation during preconception and each trimester of pregnancy through a questionnaire interview one to three days after giving birth.

The research team found that of the 7,612 mothers, 325 (4.3 percent) took folic acid supplementation almost daily preconception; 4,257 (55.9 percent) took it almost daily during the first trimester; 4,520 (59.4 percent) took it almost daily during the second trimester; and 4,416 (58 percent) took it nearly daily during the third trimester.

Overall, 6,592 (86.6 percent) mothers took no prenatal vitamins preconception at all.

Of those study women, 2,598 had maternal plasma folate concentrations available for analysis. Black and Hispanic mothers had lower plasma folate concentrations (averages of 28.2 nanomoles per liter and 30.4 nanomoles per liter, respectively) than white mothers, who had an average of 34.2 nanomoles per liter. Black and Hispanic mothers also had higher rates of folate insufficiency (defined as plasma folate concentration less than 13.5 nanomoles per liter based on World Health Organization criteria), at 12.2 percent and 8.1 percent, respectively, than white mothers, who had a 5.1 percent rate of insufficiency. Previous studies suggest babies are most at risk for neural tube defects if their mothers had insufficient folate intake.

The research team also saw a wide range of maternal plasma folate concentrations; at high end, 595 or 22.9 percent, had elevated concentrations (defined as plasma folate concentration greater than 45.3

nanomoles per liter based on WHO criteria). This suggests that folic acid supplementation is only one factor affecting plasma folate. To ensure optimal folate levels, health care professionals need to obtain a good history of maternal vitamin supplementation and diet and consider blood folate levels as indicated, explains Cheng.

Cheng and her team acknowledge that their study is limited by its use of one dataset in one city, and caution is needed to generalize to populations with different characteristics. They also note that self-reported vitamin supplementation may be inaccurate. Lastly, while the blood folate level is an objective measure, this study only measured at one time point, which at best reflects the folate concentrations during the third trimester.

But Cheng pointed out that the findings are an important step forward toward understanding folate supplementation and levels in vulnerable populations, as well as informing strategies going forward to reduce health disparities. For example, there is growing knowledge on the importance of maintaining optimal folate nutrition for maternal and fetal health, as well as long-term health of the child. Health professionals should make sure that all women of childbearing age and pregnant mothers are adequately advised and monitored with regard to folate intake, with the goal of maximizing its health benefits and minimizing adverse effects associated with excessive folate levels.

Provided by Johns Hopkins University School of Medicine

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