

Vitamin D Supplementation To Prevent Rickets in Breast-Fed Babies

Agency for Healthcare Research and Quality • 2101 East Jefferson Street • Rockville, MD 20852



Key Finding: Dark-skinned infants and children who are fed only breast milk should receive 400 IU of vitamin D supplementation daily, beginning by at least 2 months of age, to prevent rickets.

The study “Prevalence of Vitamin D-Deficient Rickets in Minority Infants” was conducted at Wake Forest University School of Medicine, Winston-Salem, and at the University of North Carolina (UNC) School of Medicine, Chapel Hill.

It was funded in part by the Agency for Healthcare Research and Quality (AHRQ), the Federal Government’s lead agency charged with supporting research to improve the quality of health care, reduce its cost, address patient safety and medical errors, and broaden access to essential services.



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Introduction

Vitamin D is necessary for proper bone growth, but it is not found in many foods naturally. It is synthesized in the skin with exposure to sunlight, but many babies do not get much exposure to the sun for a number of reasons, such as not spending time outdoors and wearing clothes, hats, or sunscreen. The darker an infant’s skin, the more sun exposure is needed to synthesize vitamin D. Although breastfeeding is the ideal form of nutrition for infants, it does not supply the vitamin D needed for healthy bone growth. Nutritional rickets is a condition in which children’s bones are too soft and do not develop properly.

Thanks largely to vitamin D supplementation of infant formula and recognition of the need for sunlight, rickets had become largely a thing of the past in the United States. However, cases of nutritional rickets among babies have been on the rise recently.

For this reason, dark-skinned infants and children who are exclusively breast fed should receive 400 IU of vitamin D supplementation daily, beginning by at least 2 months of age. This is the finding of a study, “Prevalence of Vitamin D-Deficient Rickets in Minority Infants,” conducted at Wake

Forest University School of Medicine, Winston-Salem, and at the University of North Carolina (UNC) School of Medicine, Chapel Hill. The UNC study was part of the work of the UNC Centers for Education and Research on Therapeutics (CERTs™) program. CERTs™ are funded and administered by the Agency for Healthcare Research and Quality (AHRQ).

Methods

In 1999, Wake Forest and UNC set out to find what changes in the care of infants in North Carolina could account for the increase in the number of cases of nutritional rickets seen in their two medical institutions. Records on all patients diagnosed with nutritional rickets at the two institutions during the period 1990-99 were reviewed. Information was obtained on age at diagnosis, infant feeding (breastfeeding and other foods), vitamin D supplementation (if any), racial/ethnic background, and sex, as well as x-ray findings, height, and weight. Diagnoses of nutritional rickets were based on clinical, biochemical, and x-ray findings.

After diagnosis, all the babies received vitamin D therapy, and their x-ray and laboratory abnormalities were resolved or resolving by the end of the study.



Findings and Discussion

Of 30 babies with nutritional rickets seen at the Wake Forest and UNC medical centers, all were black and all were breast fed. Most of them were growth retarded—nearly a third, severely so. Except for babies who had recently begun receiving vitamin supplementation or had begun drinking vitamin D-fortified milk, all the babies had vitamin D deficiency.

Breastfeeding among black women in North Carolina has risen dramatically in the past few years. Breast milk is the ideal form of nutrition for infants, but the amount of vitamin D in breast milk depends on the vitamin D status of the mother. Dark-skinned mothers need more exposure to sunlight than light-skinned mothers to produce the same amount of vitamin D. The same is true of darker skinned babies. Unless they receive vitamin supplements, breast-fed dark-skinned infants are at risk for rickets.

The amount of sun exposure an infant needs to prevent rickets depends on skin pigmentation, the amount of clothing worn, latitude, time of day, season of the year, amount of smog, and so on. Moreover, many parents do not want to expose their babies to too much sun for fear of skin cancer.

Maternal vitamin D status also plays a role in this vitamin deficiency, but it is impractical to test nursing mothers. Although there is no national reporting system for rickets that can give statistics on this condition nationwide, indications are that rickets is on the rise throughout the United States. Increasingly, it appears that vitamin supplementation for all breast-fed

infants is a safe, low-cost, and reasonable option.

Action Taken

As a result of these findings, the North Carolina Women's, Infants and Children (WIC) program now distributes a free multivitamin supplement for babies 6 weeks of age or older who are exclusively breastfeeding. It also sends out fact sheets on Vitamin D supplementation to both parents and health professionals.

The American Academy of Pediatrics' present policy is that vitamin D "may need to be given before 6 months of age in selected groups of infants" (infants who do not get enough sunlight or whose mothers are vitamin D deficient). A recent editorial in *The Journal of Pediatrics* questions the advisability of limiting supplementation to high-risk groups of breast-fed infants. The American Academy of Pediatrics is currently reviewing their guidelines on vitamin D supplementation.

For More Information

Study findings are presented in an article in the August 2000 issue of *The Journal of Pediatrics*. Kreiter SR, Schwartz RP, Kirkman HN, et al. Nutritional rickets in African American breast-fed infants. *J Pediatr* 2000;137(2):153-7.

The editorial on the article is in the same issue of *The Journal of Pediatrics*: Welch TR, Bergstrom WH, Tsang RC. Vitamin D-deficient rickets: the reemergence of a once-conquered disease [editorial]. *J Pediatr* 2000; 137(2):143-5.