Vitamin D in Pregnancy and Lactation

I just brought my 3-week old baby to a pediatrician and was told that I should supplement my baby with vitamin D every day. The clinic nurse said that vitamin D levels were insignificant in breast milk, and that if my baby was exclusively breastfed, she could get a vitamin D deficiency, which could cause rickets. If I supplement myself or increase my dietary vitamin D, would my baby get enough vitamin D through my milk?

Most people know vitamin D as the sunshine and milk vitamin. Sunlight and fortified milk are indeed the most common routes for obtaining the vitamin in the US. So, what happens when most of us in this day and age no longer get enough sun exposure to stimulate adequate quantities of the vitamin? What about those of us who don't or can't drink milk?

Your pediatrician is following 2003 American Academy of Pediatrics (AAP) guidelines recommending 200 International Units (IUs) daily of vitamin D for breastfeeding infants beginning within the first 2 months of life.

Unfortunately, the AAP dismisses maternal vitamin D intake during pregnancy and lactation and sunlight exposure as important sources of rickets prevention, even though these sources have sufficed for a very long time! Natural sources were scientifically proven decades ago to protect against rickets.

As I discussed in a previous Reader article on vitamin D, rickets is a bone disease commonly caused by vitamin D deficiency from a D deficient diet, lack of sunlight, or both, and resulting in soft bones and skeletal deformities. Rickets that develops in breastfed infants during the first six months of life is likely to be related to maternal vitamin D and/or calcium deficiency during pregnancy, which is often not discovered until the child is walking. The majority of rickets cases today involve dark-skinned children living in urban environments who do not consume fortified milk products due to economic, cultural, ethical or health reasons. New cutting-edge research has shown that we cannot afford to ignore the maternal/fetal vitamin D link, not only for lifelong bone and skeletal health, but also for possible protection against heart disease, lung disease, cancer, type 1 diabetes, high blood pressure, schizophrenia, multiple sclerosis, tuberculosis, skin wounds and conditions, chronic pain and the common cold.

Because I receive so many questions regarding pregnancy and infant care guidelines, let's consider for a moment what "guidelines" mean. The first definition of "guideline" in Webster's unabridged dictionary reads: "any guide or indication of a future course of action." This is a pretty good description of how we use the word medically. It is a pre-determined logarithm or set of rules for professionals and parents to follow toward achieving an accepted health goal. Hopefully the committee that writes the guidelines examines worldwide systematic research reviews, real life clinical and consumer contexts, and includes diverse professional and consumer participants free from profit-making or litigation-minded motives. In this way, guidelines can promote evidence-based practice.

By definition, then, guidelines serve a concept of greatest good, and those who interpret or define this concept in the first place play powerful roles in our health care system. In addition, guidelines are based on population data and target populations, rather than individuals. Yet in practice, in our homes, clinics, and hospitals, we apply guidelines to individuals, and individuals too often end up feeling

dismissed or invisible or worse when they question guidelines, or when guidelines actually work to undermine their own health. A genuine attempt to individualize national guidelines can make Webster's third definition of "guideline" seem more apt: "a rope or cord that serves to guide one's steps, especially over rocky terrain, through underground passages, etc."

Now back to vitamin D…. Anyone with inadequate sunlight exposure is at risk for vitamin D deficiency. Risk factors for nurslings and their mothers overlap and interact, and include indoor confinement during the day (e.g., due to exclusively indoor daycare, unsafe neighborhoods, indoor workplaces), living at higher latitudes, darker skin pigmentation, living in urban areas with pollution and/or buildings that block sunlight, sunscreen use, covering much or all of the body when outside (e.g., due to custom, fear of skin cancer, cold climate), increased birth order (e.g., a mother's sixth child has a higher risk of vitamin D deficiency than does her first child), and exposure to lead (due to lead's inhibition of vitamin D synthesis).

The AAP states that the typical 25 IU/L of vitamin D in breast milk is insufficient, without discussing who exactly classifies as "typical," how a mother can make sure she achieves optimal levels of vitamin D during pregnancy so that her newborn begins life with optimal stores, or how a mother can increase the vitamin D content of her milk. While sunlight can be an important source of vitamin D for infants, the AAP advises that infants be kept out of direct sunlight and wear protective clothing and sunscreen when exposed to sunlight. Professionals and parents who conscientiously follow AAP guidelines are left with little recourse - formula-feeding or pharmaceuticals for all Wisconsin latitude babies!

The National Institutes of Health (NIH) conducted a longitudinal study on the effect of maternal vitamin D status during pregnancy on childhood skeletal growth. The following interpretation of the research was published in The Lancet in January 2006: "Maternal vitamin D insufficiency is common during pregnancy and is associated with reduced bone-mineral accrual in the offspring during childhood…. Vitamin D supplementation of pregnant women, especially during winter months, could lead to longlasting reductions in the risk of osteoporotic fracture in their offspring."
A current prospective NIH study (still recruiting new subjects! – go to http://clinicaltrials.gov/ct/gui/show/NCT00292591) aims to determine the required levels of maternal vitamin D (as related to ethnicity and UV exposure) in the prevention of vitamin D deficiency in both mother and child: "We hypothesize that darkly pigmented mothers will require substantially higher oral supplementation with vitamin D…as compared to their Caucasian counterparts." The ongoing NIH study hypothesizes 2000-4000 IU/day for pregnant women safely protects mothers and babies. The current Daily Recommended Intake (DRI) is only 400 IU/day.

The concentration of fat-soluble vitamin D in human milk varies from 5 to 136 IU/L, depending on how its activity is measured and on maternal vitamin D status during lactation. This concentration provides less than the 200 to 400 IU/day commonly recommended for infants under one year of age. A 1986 Finnish study showed that between January and April, when sunlight is very limited in Finland, supplementing mothers with 1000 IU did not raise the vitamin D levels of their nursing infants. However, supplementing mothers with 2000 IU was just as effective at raising the vitamin D levels of the infants as was supplementing infants directly with 400 IU/day.

2000 IU/day of vitamin D3 (the recommended fish/animal form of vitamin D) can be obtained safely and effectively through a diet rich in high quality cod liver oil and other fish oils (herring, sardines, eel, salmon, trout), grass-fed, full-fat animal foods (if you like blood pudding or sausage and organ meats, all the better!), fermented foods, naturally raised duck and chicken eggs, D3-fortified foods, and, of course, direct sunlight.

Up until the Industrial Age, exposure to sunlight was the main source of vitamin D for most mothers and infants, an estimated 10,000-20,000 IU/day. A limited amount of vitamin D can be produced in any given area of skin before it reaches equilibrium, meaning that the amount of skin exposed will determine the amount of vitamin obtained from the sun. The World Health Organization states, "Two hours is the required minimum weekly amount of sunlight for infants if only the face is exposed, or 30 minutes if the upper and lower extremities are exposed." This guideline is based on a 1985 study of exclusively breastfed Caucasian infants under six months old at latitude 39°N (Cincinnati, Ohio, USA). Darker skinned infants may require a longer time outside (three to six times the sunlight exposure) to generate the same amount of vitamin D.

Parenting, even when supported by official guidelines, is often a rocky terrain filled with unknown passages. I hope this discussion has guided you in making informed choices about vitamin D, as well as in nurturing yourself at the same time you nurture your child.

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