Multiorgan Damage a Concern

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One expert suggested that the alarm may be unwarranted because the recent studies raise more questions than they answer. Everyone agreed that no one really knows how to define adequate vitamin D levels in children and adolescents, and that much more study is needed.

A report by a committee of the Institute of Medicine on what constitutes adequate intakes of vitamin D is expected to be released in the spring of 2010 and is “eagerly awaited,” said Dr. Frank Greer, professor of pediatrics at the University of Wisconsin, Madison, and a coauthor of the AAP’s 2008 guidelines on vitamin D intake.

What inflamed concerns about pediatric vitamin D levels? Studies such as one published online in Pediatrics last month (doi:10.1542/peds.2009-0051).

Nine percent of U.S. children and adolescents (representing 7.6 million people) have 25-hydroxyvitamin D (25(OH)D) deficiency and 61% (70.8 million children and adolescents) have insufficient 25(OH)D levels in serum tests, according to a study by Dr. Doshi, Dr. Kumar and associates. Only 4% were taking daily vitamin D supplementation (400 IU).

The investigators calculated prevalence using data on 9,757 children and adolescents from the 2001-2004 National Health and Nutrition Examination Survey (NHANES), defining 25(OH)D deficiency as a serum level below 15 ng/mL, and insufficiency as 15-29 ng/mL.

Evidence is mounting that bone health may not be the only issue related to vitamin D levels. After adjustment for confounding variables, analyses of data on 6,275 of the NHANES participants found that deficiency in 25(OH)D was associated with more than a threefold increased risk for elevated parathyroid hormone levels, a more than doubled risk for high-density lipoprotein (HDL) cholesterol, compared with children and adolescents whose 25(OH)D levels were at least 30 ng/mL, said Dr. Kumar of Albert Einstein College of Medicine, New York.

A separate analysis of data on 3,528 adolescents from NHANES 2001-2004 found that low serum 25(OH)D levels (less than 15 ng/mL) were associated with roughly a doubling in risk for hypertension and fasting hyperglycemia and nearly a quadrupled risk for metabolic syndrome, compared with adolescents with levels above 26 ng/mL, reported Jared P. Reis, Ph.D., of the National Heart, Lung, and Blood Institute, and his associates. The study was published online in Pediatrics last month (doi:10.1542/peds.2009-0213).

“These are staggering numbers” that are supported by smaller studies in the literature, said Dr. Catherine M. Gordon, director of the bone health program at Children’s Hospital, Boston. “We may eventually be at the point of saying that we need to universally screen vitamin D levels, just like we screen for lead levels in children,” she said in an interview, but “I don’t think we’re quite there from a cost-effectiveness standpoint. I do think that children should be universally supplemented, but that’s a controversial point.”

In addition, the AAP’s 2008 guidelines added. In rare situations, clinicians may consider vitamin D usage for rickets.”

The need has greatly increased with the rising attention to vitamin D. Not long ago, Dr. Singh’s reference lab used to process 50 serum samples per day for vitamin D levels. Today, “we may be doing 5,000 a day,” he said.

Dr. Singh will be one of three experts to present on “The Role of Vitamin D Testing this month, sponsored by the AACD (American Association for Clinical Chemistry). For information, visit www.aacc.org.

—Sherry Boschert

J ust as there is no consensus about adequate levels of vitamin D, the tests for serum vitamin D levels lack standardization, too.

“There has been a lot of controversy and debate behind the scenes” on whether to test for serum 25(OH)D using chemiluminescent technology or liquid chromatography/mass spectrometry technology, Ravinder J. Singh, Ph.D., said in an interview.

Small hospital laboratories tend to favor the former, while most of the larger reference laboratories have adopted the latter, which is considered the preferred method, said Dr. Singh, codirector of the endocrine lab at the Mayo Clinic, Rochester, Minn.

Most of the clinical analytes used in the tests lack standardization or “harmonization” from one U.S. geographical region to the next, he added. In rare situations, clinicians who interpret the results of vitamin D metabolites that labs can compare with results of their test methods for quality control, but there’s no mandate that these be used.

“There is a need for laboratories and the manufacturers of the tests to work together to standardize the testing so that clinicians can rely upon the results,” Dr. Singh said.

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There’s also a need for standard reference material to ensure accuracy in 25(OH)D testing, he added. The National Institute of Standards and Technology created vials of vitamin D metabolites that labs can compare with results of their test methods for quality control, but there’s no mandate that these be used.

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