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Millions of US children low in vitamin D

Study shows increased risk of bone and heart disease

August 3, 2009 — (BRONX, NY) — Seven out of ten U.S. children have low levels of vitamin D, raising their risk of bone and heart disease, according to a study of over 6,000 children by researchers at Albert Einstein College of Medicine of Yeshiva University. The striking findings suggest that vitamin D deficiency could place millions of children at risk for high blood pressure and other risk factors for heart disease. The study is published today in the online version of *Pediatrics*.

Vitamin D deficiency was thought to be relatively rare in the U.S. However, recent studies have documented this growing problem in adults. With cases of rickets (a bone disease in infants caused by low vitamin D levels) on the rise, it became clear that many children were also not getting enough of this essential vitamin, which is needed for healthy bone growth, among other biological processes.

"Several small studies had found a high prevalence of vitamin D deficiency in specific populations of children, but no one had examined this issue nationwide," says study leader Michal L. Melamed, M.D., assistant professor of medicine and of epidemiology & population health at Einstein. Dr. Melamed has published extensively on the importance of vitamin D.

To learn more about the prevalence of vitamin D deficiency (defined as less than 15 ng/mL of blood) and vitamin D insufficiency (15 to 29 ng/mL), the researchers analyzed data on more



VIDEO: Michal Melamed, M.D., discusses the central findings of the vitamin D study in children. Dr. Melamed is associate professor of medicine at Albert Einstein College of Medicine.

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than 6,000 children, ages one to 21, collected by the National Health and Nutrition Examination Survey (NHANES) 2001-2004.

The researchers found that 9 percent of the study sample, equivalent to 7.6 million children across the U.S., was vitamin D deficient, while another 61 percent, or 50.8 million, was vitamin D insufficient. Low vitamin D levels were especially common in children who were older, female, African-American, Mexican-American, obese, drank milk less than once a week, or spent more than four hours a day watching TV, playing videogames, or using computers.

The researchers also found that low levels of vitamin D deficiency were associated with higher parathyroid hormone levels, a marker of bone health, higher systolic blood pressure, and lower serum calcium and HDL (good) cholesterol levels, which are key risk factors for heart disease.

"We expected the prevalence of vitamin D deficiency would be high, but the magnitude of the problem nationwide was shocking," says lead author Juhi Kumar, M.D., M.P.H., a fellow in pediatrics at Children's Hospital at Montefiore Medical Center, The University Hospital and Academic Medical Center for Albert Einstein College of Medicine. Dr. Kumar will become an assistant professor of pediatrics at Weill Cornell Medical College in August, 2009.

"We know from earlier NHANES data that vitamin D levels have declined over the last 20 years," says Dr. Melamed. "Kids have more sedentary lifestyles today and are not spending as much time outdoors. The widespread use of sunscreens, which block UV-B rays, has only compounded the problem." The body uses UV-B sunlight to convert a form of cholesterol in the skin into vitamin D.

Dr. Melamed recommends that children should consume more foods rich in vitamin D, such as milk and fish. "But it's very hard to get enough vitamin D from dietary sources alone," she says.

Vitamin D supplementation can help. In the study, children who took vitamin D supplements (400 IU/day) were less likely to be deficient in the vitamin. However, only four percent of the study population actually used supplements. The American Academy of Pediatrics, which recently updated its vitamin D guidelines, now recommends that infants, children, and teens should take 400 IU per day in supplement form.

Supplements are especially important for those living in the country's northern regions where the sun may be too weak to maintain healthy vitamin D levels. Supplements are also critical for infants who are breast-fed, say the researchers. Breast milk contains relatively little vitamin D, while formula is fortified with the vitamin.

The authors recommend that pediatricians should routinely screen high-risk children for vitamin D deficiency, and that parents should ensure that their kids get adequate amounts of the vitamin through a combination of diet, supplements, and exposure to sunlight.

"The message for pediatricians is that vitamin D deficiency is a real problem with consequences not only for bone health but also potentially for long-term cardiovascular health. Pediatricians should be screening children for vitamin D levels, especially in the high-risk populations," says Dr. Kumar. A study co-led by Dr. Melamed and published in the Archives of Internal Medicine in August 2008 reported that individuals with low levels of vitamin D may have an increased risk of death from all causes.

As for parents, says Dr. Melamed, "It would good for them to turn off the TV and send their kids outside. Just 15 to 20 minutes a day should be enough. And unless they burn easily, don't put sunscreen on them until they've been out in the sun for 10 minutes, so they get the good stuff but not sun damage."

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The study, "Prevalence and Associations of 25-Hydroxyvitamin D Deficiency in Children and Adolescents in the United States: Results from NHANES 2001-2004," is published today in the online version of *Pediatrics*. Dr. Melamed and Dr. Kumar's co-authors include Paul Muntner, Ph.D., University of Alabama at Birmingham; Frederick J. Kaskel, M.D., Ph.D., Montefiore Children's Hospital; and Susan M. Hailpern, Dr.P.H., M.S., Northrop Grumman and Centers for Disease Control and Prevention.

About Albert Einstein College of Medicine of Yeshiva University

Albert Einstein College of Medicine of Yeshiva University is one of the nation's premier centers for research, medical education and clinical investigation. It is home to 2,775 faculty members, 625 M.D. students, 225 Ph.D. students, 125 students in the combined M.D./Ph.D. program, and 380 postdoctoral research fellows. In 2008, Einstein received more than \$130 million in support from the NIH. This includes the funding of major research centers at Einstein in diabetes, cancer, liver disease, and AIDS. Other areas where the College of Medicine is concentrating its efforts include developmental brain research, neuroscience, cardiac disease, and initiatives to reduce and eliminate ethnic and racial health disparities. Through its extensive affiliation network involving five hospital centers in the Bronx, Manhattan and Long Island – which includes Montefiore Medical Center, The University Hospital and Academic Medical Center for Einstein – the College of Medicine runs one of the largest post-graduate medical training programs in the

United States, offering approximately 150 residency programs to more than 2,500 physicians in training. For more information, please visit www.aecom.yu.edu

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In 2008, The Children's Hospital at Montefiore was ranked as one of "America's Best Children's Hospitals" in US News & World Report's prestigious annual listing. The Leapfrog Group lists Montefiore among the top one percent of all U.S. hospitals based on its strategic investments in sophisticated and integrated healthcare technology.

Montefiore is committed to meeting the healthcare needs of the future through medical education and manages one of the largest residency programs in the country. Montefiore is The University Hospital and Academic Medical Center for Albert Einstein College of Medicine and has an affiliation with New York Medical College for residency programs at the North Division.

Distinguished centers of excellence at Montefiore include cardiology and cardiac surgery, cancer care, tissue and organ transplantation, children's health, women's health, surgery and the surgical subspecialties. Montefiore is a national leader in the research and treatment of diabetes, headaches, obesity, cough and sleep disorders, geriatrics and geriatric psychiatry, neurology and neurosurgery, adolescent and family medicine, HIV/AIDS and social and environmental medicine, among many other specialties. For more information, please visit www.montefiore.org.
