Medical Xpress

# Vitamin D levels linked to asthma severity

April 23 2009

New research provides evidence for a link between vitamin D insufficiency and asthma severity.

Serum levels of vitamin D in more than 600 Costa Rican children were inversely linked to several indicators of allergy and asthma severity, including hospitalizations for asthma, use of inhaled steroids and total IgE levels, according to a study that will appear in the first issue for May of the American Journal of Respiratory and Critical Care Medicine.

While previous in vitro studies have suggested that vitamin D may affect how airway cells respond to treatment with inhaled steroids, this is the first in vivo study of vitamin D and disease severity in children with asthma.

Juan Celedón, M.D., Dr. P.H. and Augusto Litonjua, M.D., M.P.H. of Harvard Medical School and colleagues recruited 616 children with asthma living in the Central Valley of Costa Rica, a country known to have a high prevalence of asthma. Each child was assessed for allergic markers, including both allergen-specific and general sensitivity tests, and assessed for lung function and circulating vitamin D levels. Children whose forced expiratory volume in one second (FEV1) exceeded 65 percent of the predicted value were also tested for airway reactivity.

They found that children with lower vitamin D levels were significantly more likely to have been hospitalized for asthma in the previous year, tended to have airways with increased hyperreactivity and were likely to have used more inhaled corticosteroids, all signifying higher asthma

severity. These children were also significantly more likely to have several markers of allergy, including dust-mite sensitivity.

"To our knowledge this is the first study to demonstrate an inverse association between circulating levels of vitamin D and markers of asthma severity and allergy," wrote Drs. Celedón and Litonjua "While it is difficult to establish causation in a cross-sectional study such as this, the results were robust even after controlling for markers of baseline asthma severity."

"This study suggests that there may be added health benefits to vitamin D supplementation" said Dr. Celedón. Current recommendations for optimal vitamin D levels geared toward preserving bone health, such as preventing rickets in children and osteoporosis in adults.

"This study also provides epidemiological support for a growing body of in vitro evidence that vitamin D insufficiency may worsen asthma severity, and we suspect that giving vitamin D supplements to asthma patients who are deficient may help with their asthma control" wrote Drs. Celedón and Litonjua, noting that a clinical trial should be the next step in this research. "Whether vitamin D supplementation can prevent the development of asthma in very young children is a separate question, which will be answered by clinical trials that are getting under way," he said.

A complication is that vitamin D, unlike most other nutrients, is primarily synthesized in the body rather than consumed. Because about 90 percent of circulating vitamin D is produced by the body in response to sun exposure, deficiency is often related to behavioral issues rather than an inadequate dietary intake. Increased time spent indoors, increased use of sunscreen and sun-protective clothing all lead to decreased levels of vitamin D. Dietary sources of vitamin D, primarily fortified foods and fatty fish or fish oils, and vitamin D in current

multivitamin preparations are unlikely to make up the deficiency.

"Ultimately, it is only by investigating the effects of vitamin D in doses at, and above, those currently recommended that decisions can be made on the optimal intake of vitamin D and the possible prevention and treatment of asthma," wrote Graham Devereux, M.D., of the Department of Environmental and Occupational Medicine at the University of Aberdeen in the accompanying editorial in the same issue of the journal.

Source: American Thoracic Society (news : web)