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## Insufficient vitamin D tied to severe asthma attacks

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NEW YORK (Reuters Health) - Asthmatic children with relatively low vitamin D levels in their blood may have a greater risk of suffering severe asthma attacks than those with higher levels of the vitamin, a new study suggests.

The study, which followed more than 1,000 children with asthma for four years, found those with vitamin-D "insufficiency" at the outset were more likely to have an asthma attack that required a trip to the hospital.

Over the four-year study, 38 percent of children with insufficient vitamin D levels went to the emergency room or were hospitalized for an asthma exacerbation. The same was true of 32 percent of children with sufficient levels of the vitamin.

When the researchers considered other factors -- including the severity of the children's asthma at the study's start, their weight and their family income -- vitamin D insufficiency itself was linked to a 50 percent increase in the risk of severe asthma attacks.

Researchers led by Dr. Augusto A. Litongua, of Harvard Medical School in Boston, report the findings in the *Journal of Allergy & Clinical Immunology*.

As it stands, people are considered to have an overt deficiency in vitamin D when blood levels drop below 11 nanograms per milliliter (ng/mL). But there is debate over how the optimal vitamin D level should be defined -- and what the daily recommended intake of the vitamin should be for children and adults.

Some experts believe that vitamin D blood levels above 30 ng/mL are desirable for overall health, and that levels between deficiency and 30 ng/mL should be viewed as "insufficient."

For their study, Litongua and his colleagues considered children with vitamin D levels of 30 ng/mL or lower to be insufficient in the vitamin.

The researchers based their findings on 1,024 children with mild-to-moderate asthma who were part of a clinical trial testing two inhaled asthma medications -- budesonide and nedocromil. Using blood samples taken at the start of the trial, Litongua's team found that 35 percent of the children had vitamin D insufficiency, and 65 percent had sufficient levels.

Overall, the researchers found no evidence that sufficient vitamin D levels protected kids from moderate asthma symptoms; in fact, children with low levels of the vitamin tended to report fewer moderate symptoms.

However, these children were at greater risk of severe asthma attacks.

While the findings point to an association between vitamin D status and asthma exacerbations, they do not prove that vitamin D is responsible -- or, by extension, that taking the vitamin will prevent asthma attacks.

It is biologically plausible that vitamin D would affect the severity of asthma attacks, according to Litongua and his colleagues.

Vitamin D may be best known for its role in healthy bone development and maintenance, but it is also needed for normal nerve, muscle and immune system function. Some studies have linked low vitamin D levels to a higher risk of type 1 or "insulin-dependent" diabetes in children and, in adults, heart disease and certain cancers.

The effects of vitamin D on the immune system, which include the inflammatory response to infections, might help explain why higher levels of the vitamin were linked to a lower risk of severe asthma exacerbations, according to Litongua's team.

They say it's also possible that vitamin D enhances the effects of anti-inflammatory steroid hormones -- both the body's natural supply and the synthetic corticosteroids used to treat asthma.

In this study, the beneficial association between vitamin D and asthma attacks was mainly seen in children who were on budesonide, a corticosteroid.

The American Academy of Pediatrics recommends that infants, children and teenagers get 400 IU of vitamin D each day. Milk, breakfast cereals and orange juice fortified with the vitamin are the main food sources, though some fatty fish naturally contain high amounts of vitamin D. Experts recommend vitamin pills for children who do not get enough of the vitamin from food.

Vitamin D is naturally synthesized in the skin when it is exposed to sunlight, but long winters and sun avoidance in the summer mean that many kids may not get enough vitamin D this way. In addition, vitamin D synthesis is less efficient in people with darker skin, and African Americans are at higher risk of deficiency than whites.