

Vitamin D deficiency and insufficiency impacts children's risk for severe forearm fractures

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Children who are vitamin D deficient have a greater risk of having more severe forearm fractures requiring surgical treatment, according to a new study presented today at the 2018 Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS). This is the first report that shows the important link between low vitamin D levels and the severity of fractures in children caused by low-energy, less traumatic events such as falling off a bike or falling while running.

Fractures in children are very common, with some estimates as high as 50 percent of boys and 40 percent of girls having at least one fracture by age 18. Of these [fractures](#), the forearm is the most common site, accounting for approximately 25 percent of all pediatric fractures in the U.S.

"Not only are forearm fractures common in children, but so is vitamin D deficiency and insufficiency," said Pooya Hosseinzadeh, MD, assistant professor, Department of Orthopaedic Surgery at Washington University School of Medicine in St. Louis. "Knowing that vitamin D deficiency can lead to negative calcium balance, low bone mineral density and quality leading to compromised bone strength, it makes sense for patients to be more susceptible to fractures at lower impact load and more susceptible to greater severity when fractures do occur."

In this study, 100 children (ages 3 to 15; 65 percent male, 35 percent

female) with low-energy forearm fractures were prospectively enrolled. Each participant filled out a questionnaire focusing on risk factors for vitamin D deficiency. The mean 25-hydroxyvitamin D (25[OH]D) concentration was 27.5 ± 8.3 ng/ml.

The fractures were then categorized as requiring non-operative or operative management. The children's vitamin D status was based on measurement of 25(OH)D concentration obtained during the clinic visit, and was compared between the two fracture groups.

Among the results of the study:

- Using Endocrine Society guidelines, 21 percent of patients were vitamin D deficient (25(OH)D)
- There was a dramatic difference in incidence rates of vitamin D deficiency between those treated surgically (50 percent) compared to those in the non-operative group (17 percent).
- Being vitamin D deficient was also associated with a greater risk of needing operative management (28.6 percent versus 7.6 percent non-operative).
- Being overweight/obese and nonwhite increased the likelihood of vitamin D deficiency.
- Seventy-five percent of children in the operative group were obese or overweight, compared to only 32 percent of children in the non-operative group.
- Patients requiring operative management were older than 10 years of age and had greater BMI than patients not requiring surgery.

"This study provides an important takeaway for parents and pediatricians." explains Dr. Hosseinzadeh. "If a child does have a forearm fracture, we would encourage the physician to check the patient's vitamin D levels. The good news is that in most cases, [children](#)

can reduce deficiency with a [vitamin D](#) supplement and increasing outdoor activity."

Provided by American Academy of Orthopaedic Surgeons

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