

# Vitamin D Status in Abused and Nonabused Children Younger Than 2 years Old with Fractures

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**OBJECTIVE:** To examine vitamin D levels in children with (1) suspected abusive and accidental fractures, (2) single and multiple fractures, and (3) fracture types highly associated with inflicted trauma.

**DESIGN AND METHODS:** A study of children younger than 2 years of age with fractures admitted to a large children's hospital was performed. Bivariate analysis and test for trend were performed to test for the association of vitamin D status and biochemical markers of bone health with the primary outcomes of fracture etiology, number, and type.

**RESULTS:** Of 118 subjects in the study, 8% had deficient vitamin D levels ( $<20$  ng/mL;  $<50$  nmol/L), 31% were insufficient ( $\geq 20 < 30$  ng/mL;  $\geq 50 < 78$  nmol/L), and 61% were sufficient ( $\geq 30$  ng/mL;  $\geq 78$  nmol/L). Lower vitamin D levels were associated with higher incidences of hypocalcemia ( $P = .002$ ) and elevated alkaline phosphatase ( $P = .05$ ) but not hypophosphatemia ( $P = .30$ ). The majority of children sustained accidental fractures (60%); 31% were nonaccidental and 9% were indeterminate. There was no association between vitamin D levels and any of the following outcomes: child abuse diagnosis ( $P = .32$ ), multiple fractures ( $P = .24$ ), rib fractures ( $P = .16$ ), or metaphyseal fractures ( $P = .49$ ).

**CONCLUSIONS:** Vitamin D insufficiency was common in young children with fractures but was not more common than in previously studied healthy children. Vitamin D insufficiency was not associated with multiple fractures or diagnosis of child abuse. Nonaccidental trauma remains the most common cause of multiple fractures in young children.

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[Pediatrics](#)

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