

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 (≥ 30 ng/mL; ≥ 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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