

Prevalence of Vitamin D Deficiency in Pediatric Limb Lengthening and Deformity Patients

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Introduction

- Insufficient vitamin D is a common nutritional deficit that has been associated with fracture risk and poor bone health.
- Serum 25-hydroxyvitamin D [25(OH)D] levels less than 30 ng/mL are considered insufficient for bone health.
- This research aimed to determine the prevalence of vitamin D deficiency in pediatric patients undergoing limb lengthening and deformity correction.

Methods

- A retrospective study was conducted of pediatric patients younger than age 17 who underwent a lower extremity long bone osteotomy for length and/or deformity correction at a single referral center between 2014 and 2018.
- Patients were identified by screening case logs for osteotomy procedures followed by acute deformity correction and fixation, placement of a circular external fixator, or insertion of an intramedullary lengthening nail.
- Data collected included age, sex, race, diagnosis, long bone treated, and peri-operative 25(OH)D level for descriptive statistics.

Results

- Of the 214 subjects identified as having undergone an osteotomy, 172 (80%) had a peri-operative 25(OH)D level available.
- Patients undergoing osteotomy and acute correction had a 3.3 lower odds of having a 25(OH)D lab ($p < 0.001$).
- Of patients with a lab result available, most subjects were female (93/172, 54%) and Caucasian (127/172, 74%) with a mean age of 12.7 ± 3.7 years.
- Congenital diagnoses were most common (79/172, 46%) followed by miscellaneous diagnoses (28%), dwarfism (12%), post-traumatic growth arrest (9%), and post-infectious growth arrest (5%).
- The mean 25(OH)D level was 28.7 ± 17.4 ng/mL (range, 9.1–103.5 ng/mL).
- Deficient levels (< 20 ng/mL): 55/172 (32%)
- Insufficient levels (20–29.9 ng/mL): 70/172 (41%)
- Adequate levels (≥ 30 ng/mL): 47/172 (27%)

Discussion

- Limb lengthening and deformity correction requires optimal bone metabolism for healing of osteotomy sites and new regenerate bone.
- This study found a high prevalence of 25(OH)D insufficiency in pediatric limb lengthening and deformity correction patients, though acute correction patients were less likely to have this lab checked.
- Identifying these patients preoperatively may allow for vitamin D “pre-habilitation” to optimize bone health prior to osteotomy procedures.