Prevalence of Abnormal Vitamin D Levels Among Division I NCAA Athletes.

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BACKGROUND: Up to 1 billion people have insufficient or deficient vitamin D levels. Despite the well-documented, widespread prevalence of low vitamin D levels and the importance of vitamin D for athletes, there is a paucity of research investigating the prevalence of vitamin D deficiency in athletes.

HYPOTHESIS: We investigated the prevalence of abnormal vitamin D levels in National Collegiate Athletic Association (NCAA) Division I college athletes at a single institution. We hypothesized that vitamin D insufficiency is prevalent among our cohort.

STUDY DESIGN: Cohort study.

LEVEL OF EVIDENCE: Level 1.

METHODS: We measured serum 25-hydroxyvitamin D (25(OH)D) levels of 223 NCAA Division I athletes between June 2012 and August 2012. The prevalence of normal (≥32 ng/mL), insufficient (20 to <32 ng/mL), and deficient (<20 ng/mL) vitamin D levels was determined. Logistic regression was utilized to analyze risk factors for abnormal vitamin D levels.

RESULTS: The mean serum 25(OH)D level for the 223 members of this study was 40.1 ± 14.9 ng/mL. Overall, 148 (66.4%) participants had sufficient 25(OH)D levels, and 75 (33.6%) had abnormal levels. Univariate analysis revealed the following significant predictors of abnormal vitamin D levels: male sex (odds ratio [OR] = 2.83; P = 0.0006), Hispanic race (OR = 6.07; P = 0.0063), black race (OR = 19.1; P < 0.0001), and dark skin tone (OR = 15.2; P < 0.0001). Only dark skin tone remained a significant predictor of abnormal vitamin D levels after multivariate analysis (adjusted OR = 15.2; P < 0.0001).

CONCLUSION: In a large cohort of NCAA athletes, more than one third had abnormal vitamin D levels. Races with dark skin tones are at much higher risk than white athletes. Male athletes are more likely than female athletes to be vitamin D deficient. Our study demonstrates a high prevalence of vitamin D deficiency among healthy NCAA athletes.

CLINICAL RELEVANCE: Many studies indicate a significant prevalence of vitamin-D insufficiency across various populations. Recent studies have demonstrated a direct relationship between serum 25(OH)D levels and muscle power, force, velocity, and optimal bone mass. In fact, studies examining muscle biopsies from patients with low vitamin D levels have demonstrated atrophic changes in type II muscle fibers, which are crucial to most athletes. Furthermore, insufficient 25(OH)D levels can result in secondary hyperparathyroidism, increased bone turnover, bone loss, and increased risk of low trauma fractures and muscle injuries. Despite this well-documented relationship between vitamin D and athletic performance, the prevalence of vitamin D deficiency in NCAA athletes has not been well studied.

KEYWORDS: athletes; deficiency; prevalence; vitamin D
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