

Abstract ▾

Send to: ▾

Sports Health. 2014 Jul;6(4):340-7. doi: 10.1177/1941738114524517.

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

Villacis D¹, Yi A¹, Jahn R¹, Kephart CJ¹, Charlton T¹, Gamradt SC¹, Romano R², Tibone JE¹, Hatch GF 3rd¹.

Author information

Abstract

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

Full text links



Save items

Related citations in PubMed

High prevalence of vitamin D insuffici [Clin J Sport Med. 2010]

Hypovitaminosis D in patients sc [J Bone Joint Surg Am. 2010]

Clinical utility of vitamin d at Health Technol Assess Ser....]

Review Effectiveness and vid Rep Technol Assess (Full ...]

Review [Frontiers in vitamin D; basic resear [Clin Calcium. 2011]

See reviews...

See all...

Related information


Articles frequently viewed together


MedGen

References for this PMC Article


Recent Activity

[Turn Off](#) [Clear](#)

 Vitamin d profile in national football league player PubMed

 High prevalence of vitamin D insufficiency in athl PubMed

 Prevalence of Abnormal Vitamin D Levels Am PubMed

 Pharmacologically induced hypothermia attenuat PubMed

PMID: 24982708 [PubMed] PMCID: PMC4065560 [Available on 2015-07-01]



Does vitamin D deficiency contribute to erectile

[See more...](#)**LinkOut - more resources****PubMed Commons**[PubMed Commons home](#)

0 comments

[How to join PubMed Commons](#)You are here: [NCBI](#) > [Literature](#) > [PubMed](#)[Write to the Help Desk](#)**GETTING STARTED**[NCBI Education](#)
[NCBI Help Manual](#)
[NCBI Handbook](#)
[Training & Tutorials](#)**RESOURCES**[Chemicals & Bioassays](#)
[Data & Software](#)
[DNA & RNA](#)
[Domains & Structures](#)
[Genes & Expression](#)
[Genetics & Medicine](#)
[Genomes & Maps](#)
[Homology](#)
[Literature](#)
[Proteins](#)
[Sequence Analysis](#)
[Taxonomy](#)
[Training & Tutorials](#)
[Variation](#)**POPULAR**[PubMed](#)
[Bookshelf](#)
[PubMed Central](#)
[PubMed Health](#)
[BLAST](#)
[Nucleotide](#)
[Genome](#)
[SNP](#)
[Gene](#)
[Protein](#)
[PubChem](#)**FEATURED**[Genetic Testing Registry](#)
[PubMed Health](#)
[GenBank](#)
[Reference Sequences](#)
[Gene Expression Omnibus](#)
[Map Viewer](#)
[Human Genome](#)
[Mouse Genome](#)
[Influenza Virus](#)
[Primer-BLAST](#)
[Sequence Read Archive](#)**NCBI INFORMATION**[About NCBI](#)
[Research at NCBI](#)
[NCBI News](#)
[NCBI FTP Site](#)
[NCBI on Facebook](#)
[NCBI on Twitter](#)
[NCBI on YouTube](#)**Copyright | Disclaimer | Privacy | Browsers | Accessibility | Contact**National Center for Biotechnology Information, U.S. National Library of Medicine
8600 Rockville Pike, Bethesda MD, 20894 USA