

BMC Series blog



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The vitamin D paradox in Black Americans

According to the U.S. National Institutes of Health, a paradox exists in which, despite markedly low (or "deficient") measures of vitamin D status in Black Americans, the incidence of falls, fractures, or osteopenia are significantly lower compared to White American counterparts with similar vitamin D status. An [expert panel meeting report published in BMC Proceedings](#) presents a panelist discussion regarding this issue.

[LaVerne L. Brown](#) 15 May 2018

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It is generally understood that vitamin D plays a role in exerting health benefits related to bone strength and condition. However, the significance of that role is not well understood. A number of misconceptions about vitamin D may have contributed to the ambiguity and should be addressed.

First, vitamin D is not really a vitamin. Vitamins are essential nutrients that the human body is incapable of producing. As such, vitamins must be obtained through diet. Vitamin D, on the other hand, is produced in mammalian skin upon exposure to UV rays from the sun.

Secondly, vitamin D is not *directly* responsible for exerting health benefits related to bone strength. Instead, vitamin D is converted to a pre-hormone, 25-hydroxyvitamin D, in the liver. This pre-hormone circulates in the blood and is measured to determine the vitamin D status of an individual. However, it (like vitamin D) is inactive under normal biological conditions. Conversion of the pre-hormone to the active hormone (1,25-dihydroxyvitamin D) takes place in the kidney. The biological effects of the active hormone (1,25-dihydroxyvitamin D) have been demonstrated at a number of cell and tissue sites, and its

activity is strongly linked to calcium maintenance.

Thirdly, many consumers and healthcare providers are either unaware or simply fail to acknowledge that vitamin D status (when determined via measurements of serum levels of the pre-hormone, 25-hydroxyvitamin D) does not necessarily correlate to the same health outcomes in all individuals. This underappreciated detail about vitamin D status was explored in depth in [The vitamin D paradox in Black Americans: a systems-based approach to investigating clinical practice, research, and public health – expert panel meeting report](#).

How does the relationship between vitamin D status and bone health differ in various segments of the population?

Studies show that low measures of vitamin D status correlate to increased risk of osteopenia and fractures in White and Mexican-Americans, but measures of vitamin D status do not correlate to the same health outcomes in Black Americans. Despite markedly low measures of vitamin D status in Black Americans, the incidence of falls, fractures, or osteopenia are significantly lower compared to White American counterparts with similar vitamin D status. The [BMC Proceedings report](#) describes discussions amongst expert panelists that revealed that Black Americans gain no skeletal benefits from high doses of vitamin D supplementation; and high levels of the current marker for vitamin D status are almost certain to result in adverse effects in this population.

Should Black Americans worry about low measures of vitamin D status?

There are many factors that affect vitamin D status and skeletal health in Black Americans. Data presented in the *BMC Proceedings* report shows that adiposity, skin pigmentation, genetics, and environment all contribute to differences in vitamin D status with respect to skeletal health in Black Americans vs. White Americans; but no one factor could fully explain the significance of low measures of vitamin D status with respect to skeletal health in Black Americans. A better understanding of these factors may be key to understanding mechanisms for improving bone health in all populations.

Where do we go from here?

Consumers and healthcare providers should appreciate the potential for adverse effects following over-supplementation with high doses of vitamin D in some individuals. While threshold values (deficient lower levels vs. safe upper levels) for individuals require further refinement, outcomes presented in the *BMC Proceedings* report suggest that the Recommended Daily Allowance values (400-600 IU/day) should be appropriate for most healthy populations.

Health scientists should appreciate the need to better understand the role of vitamin D and its significance in various segments of the population that are commonly underrepresented in clinical studies. A larger forum or workshop on the topic may help to stimulate more research on vitamin D with respect to bone health as well as implications beyond bone health.

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[The vitamin D paradox in Black Americans: a systems-based approach to investigating clinical practice, research, and public health - expert panel meeting report](#)

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4 COMMENTS

[Henry Lahore](#)

16th May 2018 01:30

The real paradox is that Blacks need as much Vit D for health, but not as much D for strong bones – May 2018

https://vitamindwiki.com/tiki-index.php?page_id=9612

LaVerne Brown

23rd May 2018 16:33

Dear Henry,

The Institute of Medicine concluded in its 2010 report that the evidence for a benefit of vitamin D beyond bone health (such as cancer and cardiovascular disease) is inconclusive and insufficient to drive specific nutritional requirements for vitamin D intake.

Pat

19th May 2018 18:19

I have seen 'white' America in another source. Where is the defining line between white/black America? Does that include people whose parents are from India? How about 1 white parent and 1 black parent? American Indians? Hispanic. Using this term doesn't tell us much. Why is the science community using it?

LaVerne Brown

23rd May 2018 16:18

Dear Pat,

Thank you for the comment. Tools used in the studies that explored the effect of vitamin D on skeletal health in various segments of the population relied heavily on self-report or self-identifying feedback. Even with this approach, clear differences in vitamin D outcomes were observed. Still, the need to explore the topic deeper with consideration of ancestry or genetics was addressed and discussed in the article, <https://bmcproc.biomedcentral.com/articles/supplements/volume-12-supplement-6>

Comments are closed.



LaVerne L. Brown

LaVerne L. Brown, Ph.D. was trained in natural products and medicinal chemistry, and she is currently a Program Officer in the Office of Dietary Supplements at the National Institutes of Health. She is developing a research portfolio that aims to clarify how metabolic adaptations to biological and environmental stressors might affect nutrient status and overall health status in individuals. Dr. Brown hopes the portfolio will promote a better understanding of biochemical mediators of resilience and increase research investigations of segments of the population that are often under-sampled in clinical studies.

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