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Regulation of Vitamin D Production Is Independent of Skin Color

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Vitamin D deficiency causes bone disease (i.e., rickets, osteomalacia, and osteoporosis), and low normal or "insufficient" levels have been associated with a variety of negative health outcomes, including certain types of cancers, neurologic disease, autoimmune disease, and cardiovascular disease (Stechschulte *et al*., 2009). Improving vitamin D levels has been advocated and supported by various reports, including a meta-analysis of 18 randomized trials on vitamin D, which found that individuals assigned to receive vitamin D had a 7% reduction in mortality from any cause (Autier and Gandini, 2007). Certain groups, including the elderly and those with darker skin, have lower levels of vitamin D in general, and they appear to be at greater risk for outcomes associated with insufficiency (Wolpowitz and Gilchrest, 2006). Some researchers have advocated increasing vitamin D levels through sun exposure. Clearly, a better understanding of the effect of ultraviolet (UV) irradiation on vitamin D levels is needed.

Bogh *et al*. (2010, this issue) studied the effect of systematic broadband UVB exposure on individuals with varying vitamin D levels. After an initial screening of vitamin D levels in 182 individuals, 50 were exposed to UVB radiation. From this group, a subset of 28 non–sun worshippers (those who reported behaviors that result in limited sun exposure) were examined in detail to determine the factors that might affect vitamin D levels following UVB irradiation. Individuals with low baseline vitamin D levels increased their vitamin D levels after UVB irradiation significantly more than did those with higher baseline levels. This increase positively correlated with baseline total cholesterol levels, but it did not correlate with constitutive or facultative pigmentation.

Through the following questions, we examine this paper in greater detail. For brief answers, please refer to the supplementary material online <http://www.nature.com/jid/journal/v130/n2/suppinfo/jid2009407s1.html>

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QUESTIONS

1. Describe how vitamin D is produced and how it works.
2. What are considered the "normal" and "abnormal" levels of vitamin D, and how were these determined?
3. How did the design of the study affect its results?
4. What are the results of the study?
5. What are the limitations of the study?
6. What are the conclusions and clinical implications of the study?

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