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Standard-Dose vs High-Dose Multivitamin Supplements for HIV

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To the Editor:

In the study by Dr Isanaka and colleagues,[1] patients with human immunodeficiency virus (HIV) receiving highly active antiretroviral therapy were treated either with standard-dose or high-dose multivitamin supplements, with no difference in outcomes. The authors concluded that high-dose vitamin supplements have no benefit in these patients.

Higher doses of vitamins should result in higher plasma or tissue vitamin concentrations. For vitamin C, the dose-concentration relationship in healthy young women is sigmoidal.[2] Rapid increases in plasma concentrations occur at intakes of 30 mg/d to 100 mg/d, with only small increases at higher intakes. For the doses of 80 mg/d (standard-dose regimen) and 500 mg/d (high-dose regimen) of vitamin C used in this study, predicted plasma vitamin C concentrations are 55 μM and 74 μM, respectively, using published dose-concentration curves.[2]

By comparison, the vitamin C deficiency disease scurvy occurs when plasma vitamin C concentrations are less than 5 μM. Dietary surveys suggest vitamin C intakes may range from 17 mg/d[3] to 90 mg/d[4] in sub-Saharan Africa. For patients with HIV, if a 30-mg/d intake from foods (one-third of a glass of orange juice) is also added, predicted plasma vitamin C concentrations are 63 μM for those receiving 80 mg/d and 74 μM for those receiving 500 mg/d.

This small difference is unlikely to be physiologically significant, especially considering that intracellular vitamin C concentrations saturate before plasma.[2] It is possible that vitamin C absorption, use, or excretion in patients with HIV is abnormal, and the above predictions are not applicable. Measurement of plasma vitamin C concentrations is essential for better study design and more focused studies in the future.

For many vitamins, dose-concentration relationships have not been established rigorously in persons without disease. Without such data, it is difficult to know what doses would produce clear and physiologically significant differences between treatment and control groups. This may be 1 reason why most studies of the efficacy of vitamin supplements are negative.

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Another perhaps more likely possibility is that large doses of vitamins, more than necessary to prevent deficiency and to replenish body stores, have no benefit. More may not be better than enough.

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