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Original Research

The Effects of a Multivitamin/Mineral Supplement on Micronutrient Status, Antioxidant Capacity and Cytokine Production in Healthy Older Adults Consuming a Fortified Diet

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Background: Inadequate micronutrient intake among older adults is common despite the increased prevalence of fortified/enriched foods in the American diet. Although many older adults take multivitamin supplements in an effort to compensate, studies examining the benefits of this behavior are absent.

Objective: To determine whether a daily multivitamin/mineral supplement can improve micronutrient status, plasma antioxidant capacity and cytokine production in healthy, free-living older adults already consuming a fortified diet.

Methods: An eight-week double-blind, placebo-controlled clinical trial among 80 adults aged 50 to 87 years (mean=66.5±8.6 years).

Results: Multivitamin treatment significantly increased ($p<0.01$, compared to placebo) plasma concentrations of vitamins D (77 to 100 nmol/L), E (27 to 32 μmol/L), pyridoxal phosphate (55.1 to 75.2 nmol/L), folate (23 to 33 nmol/L), B12 (286 to 326 pmol/L)), C (55 to 71 μmol/L), and improved the riboflavin activity coefficient (1.23 to 1.15), but not vitamins A and thiamin. The multivitamin reduced the prevalence of suboptimal plasma levels of vitamins E ($p=0.003$), B12 ($p=0.004$), and C ($p=0.08$).

Neither glutathione peroxidase activity nor antioxidant capacity (ORAC) were affected. No changes were observed in interleukin-2, -6 or -10 and prostaglandin E_2, proxy measures of immune responses.

Conclusions: Supplementation with a multivitamin formulated at about 100% Daily Value can decrease the prevalence of suboptimal vitamin status in older adults and improve their micronutrient status to levels associated with reduced risk for several chronic diseases.

Key words: aging, antioxidant, multivitamin, supplementation