

Abstract

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The efficacy and safety of multivitamin and mineral supplement use to prevent cancer and chronic disease in adults: a systematic review for a National Institutes of Health state-of-the-science conference.

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BACKGROUND: Multivitamin and mineral supplements are the most commonly used dietary supplements in the United States.

PURPOSE: To synthesize studies on the efficacy and safety of multivitamin/mineral supplement use in primary prevention of cancer and chronic disease in the general population.

DATA SOURCES: English-language literature search of the MEDLINE, EMBASE, and Cochrane databases through February 2006 and hand-searching of pertinent journals and articles.

STUDY SELECTION: Randomized, controlled trials in adults were reviewed to assess efficacy, and randomized, controlled trials and observational studies in adults or children were reviewed to assess safety.

DATA EXTRACTION: Paired reviewers extracted data and independently assessed study quality.

DATA SYNTHESIS: 12 articles from 5 randomized, controlled trials that assessed efficacy and 8 articles from 4 randomized, controlled trials and 3 case reports on adverse effects were identified. Study quality was rated fair for the studies on cancer, cardiovascular disease, cataracts, or age-related macular degeneration and poor for the studies on hypertension. In a poorly nourished Chinese population, combined supplementation with beta-carotene, alpha-tocopherol, and selenium reduced the incidence of and mortality rate from gastric cancer and the overall mortality rate from cancer by 13% to 21%. In a French trial, combined supplementation with vitamin C, vitamin E, beta-carotene, selenium, and zinc reduced the rate of cancer by 31% in men but not in women. Multivitamin and mineral supplements had no significant effect on cardiovascular disease or cataracts, except that combined beta-carotene, selenium, alpha-tocopherol, retinol, and zinc supplementation reduced the mortality rate from stroke by 29% in the Linxian study and that a combination of 7 vitamins and minerals stabilized visual acuity loss in a small trial. Combined zinc and antioxidants slowed the progression of advanced age-related macular degeneration in high-risk persons. No consistent adverse effects of multivitamin and mineral supplements were evident.

LIMITATIONS: Only randomized, controlled trials were considered for efficacy assessment. Special nutritional needs, such as use of folic acid by pregnant women to prevent birth defects, were not addressed. Findings may not apply to use of commercial multivitamin supplements by the general U.S. population.

CONCLUSIONS: Evidence is insufficient to prove the presence or absence of benefits from use of multivitamin and mineral supplements to prevent cancer and chronic disease.

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