Multivitamins and Chronic Disease Prevention

In 2014, the US Preventive Services Task Force (USPSTF) released a recommendation statement on use of vitamin, mineral, and multivitamin supplements for primary prevention of cardiovascular disease and cancer. The USPSTF concluded that "current evidence is insufficient to assess the balance of benefits and harms of single- or paired-nutrient supplements (except β-carotene and vitamin E) for the prevention of cardiovascular disease or cancer."

The USPSTF also "recommend against β-carotene or vitamin E supplements for the prevention of cardiovascular disease or cancer." Other reviews have found null results or possible harm, including a recent study on multivitamins and cognitive decline in men and one on multivitamins after myocardial infarction (MI).

Background on the USPSTF statement
The USPSTF completed a systemic review of the literature to review evidence for the benefits and harms of vitamin and mineral supplements in community-dwelling, nutrient-sufficient adults for the primary prevention of cardiovascular disease (CVD) and cancer. MEDLINE®, Embase®, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and Database of Abstracts of Reviews of Effects were searched for information produced between January 2005 and January 2013, as well as studies included in a 2003 USPSTF review. The task force sought studies of the following vitamins and minerals: vitamins A, B_1, B_2, and B_6, folic acid, β-carotene, and selenium. A total of 12,766 abstracts and 277 full-text articles were reviewed.

The final review included 26 studies (24 randomized, controlled studies and 2 cohort studies) that examined the benefits and harm of using vitamin and mineral supplements for primary prevention of CVD, cancer, or all-cause mortality in healthy individuals without known nutritional deficiencies. The task force found no consistent evidence that the supplements affected CVD, cancer, or all-cause mortality. In most cases, the data was insufficient to draw any conclusion, although for vitamin E and β-carotene a lack of benefits was consistent across several trials. Two trials found a small borderline-significant benefit from multivitamin supplements on cancer in men only and no effect on CVD.

It is important to note that little consistent evidence of harm was found across studies. Vitamin A use in one trial was associated with increased risk for lung cancer, but it was combined with β-carotene. Two cohort studies indicated that vitamin A was associated with an increased risk of hip fracture. One study found that folic acid supplementation was associated with an increased incidence of prostate cancer.

Multivitamins after MI

This double-blind, placebo-controlled, randomized trial looked at 1708 patients 50 years of age or older who had MI at least 6 weeks earlier. Patients were assigned randomly to an oral 28-component, high-dose multivitamin and mineral mixture or a placebo. The study found that oral multivitamins and multiminerals did not statistically significantly reduce CVD events with patients after MI who received standard medication. This conclusion was tempered by a high nonadherence rate.

Multivitamins and cognitive decline in men

This randomized, double-blind, placebo-controlled trial used data from the Physician's Health Study (1997 to 2011), using 5947 male physicians 65 years of age or older. Up to four repeated cognitive assessments by telephone interview were completed over 12 years. The study found no difference in mean cognitive change over time between multivitamin and placebo groups.

Multivitamin facts

Multivitamin supplement use increased from 30% of US adults between 1988 and 1994 to 39% between 2003 and 2006. The US supplement industry reached $28 billion in annual sales in 2010.

Supplement ingredients sold in the United States before October 15, 1994, do not need review by the US Food and Drug Administration for safety before they are marketed, because they are considered safe based on their history of use by humans.

Scientific evidence shows that some dietary supplements are beneficial for overall health and for managing some health conditions, such as:

- Calcium and vitamin D are important for keeping bones strong and reducing bone loss
- Folic acid decreases the risk of certain birth defects
- Omega-3 fatty acids from fish oils might help some people with heart disease

Some dietary supplements may interact with medications or pose risks if you have medical problems or are going to have surgery.

Implications for dietetics practitioners

Registered dietitians and registered dietitian nutritionists generally recommend "foods first" as a source of vitamins and minerals. Although the general public may take vitamin or mineral supplements in an attempt to prevent chronic disease, recent research does not support the effectiveness of their use for that purpose.

References and recommended readings

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