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Editorial

Vitamin C in the daily diet and modern medicine

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1. Introduction

Vitamin C is a water-soluble vitamin essential for collagen biosynthesis, carnitine, catecholamine metabolism, and dietary iron absorption. A human body does not synthesize vitamin C, so it must be obtained from fruit and vegetable consumption. The vitamin is usually present in citrus fruits and juices, berries, tomatoes, green leafy vegetables, and other food. Ascorbic acid is vitamin C functions as a cofactor, enzyme complement, co-substrate, and potent antioxidant in various reactions and metabolic processes. It also improves iron absorption while stabilizing vitamin E and folic acid. It decreases the inflammatory response, including sepsis syndrome, nullifies free radicals and toxins.¹

1.1. Mode of action

The absorption process is involved through two transporters; one is hexose transporters (HT) and another one sodium-dependent vitamin C transporters (SVCTs). In the brain, the pituitary gland, the adrenal gland, WBCs, and in the eyes highest concentration of ascorbic acid is observed. Although vitamin C is absorbed entirely in the small intestine, the percentage of absorbed vitamin C declines while intraluminal concentrations rise.^{2,3}

1.2. Symptoms

Adults who lack vitamin C experience fatigue, weakness, and restlessness. They may have a loss of weight and musculoskeletal and joint problems. Bleeding can occur under the skin (around hair follicles/bruises), around the gums, and into the joints, and gums swell, turn purple, and become spongy. The skin becomes dry, rough, and scaly, while the hair becomes brittle, dry, and curled, and fluid might cause abnormalities in the legs. Anemia is prevalent and likely to develop in vitamin C deficiency. Other infections can cause, and wounds may not completely heal due to this vitamin. Infants may get irritable, have discomfort when moving, and lose their appetite. Infants do not acquire weight as quickly as they should; their bone growth is delayed.²

1.3. Causes

There are insufficient dietary vitamin C in general, crisis during pregnancy and lactation, surgery, and post-operative stages. Health issues that cause fever and inflammation, hyperthyroidism, hyperparathyroidism, diarrhea, and dehydration may affect bio availability. Smoking and tobacco chewing are significant risk factors.²⁻⁴

1.4. RDA and medication administration

As per the Indian Council of Medical Research-NIN (ICMR-National Institute of Nutrition), a 65 kg man and

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55 kg woman, recommended dietary allowance (RDA) of vitamin C should be 80 mg and 65 mg per day, respectively. A pregnant woman needs 15 mg, and lactating mother requires 50mg more than the mentioned average RDA. Similarly, infants' RDA should be 20 mg-30mg, and for children, from 1 year to 9 years, the RDA should be 30 mg -45 mg/day. The Indian boys and girls (age group 10-18 years) must be within 55 mg-70 mg/day based on their average weight, height, and other health issues. Vitamin C is available in chewable tablets and other forms. In case of IV injection, reduce adverse effects by diluting the drug with average glucose or saline.^{5,6}

1.5. Indications

Vitamin C natural sources and chewable tablets are consumed for Scurvy. The vitamin benefits patients with asthma, arthritis, collagen issues, gingivitis, glaucoma, heat stroke, pneumonia, rheumatic fever, sinusitis, hemovascular disorders, burns, and other chronic and critical illnesses.²⁻⁷

1.6. Contraindication

Supplementing with vitamin C is not advised if a person/patient already has thalassemia, hemochromatosis, G6PD deficiency, and sickle cell disease. It must not be taken a right before or after angioplasty. Vitamin C supplements should be taken with caution by people with diabetes because it may increase blood sugar levels. It should be considered with caution in oxalate nephropathy or nephrolithiasis because of ascorbic acid. Ascorbic acid's acidification enhances the risks of cysteine, urate, and oxalate stone formation. Headaches, flushing, nausea or vomiting, and dizziness are all side effects of IV use. A daily intake of 6 g vitamin C has been associated with migraine headaches. Therefore, this vitamin should be consumed as per physicians' and dietitians' proper advice.⁸⁻¹⁰

2. Source of Funding

None.

3. Conflict of interest

None.

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