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Role of vitamin E in prevention of oral cancer

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ABSTRACT

Oral cancer is one of the major global threads to public health. The development of oral cancer is tobacco related mainly. Vitamin-E can inhibit reaction of the tobacco specific nitrosamine which undergoes specific activation, detoxification process. Dietary substitute such as vitamin-E can prevent oral cancer at a very early stage that is in premalignant lesions, in premalignant conditions. Main action of vitamin E includes increase immunity, controls free radicals mediated cell disturbances, maintains membrane integrity, inhibit cancer cell growth, cytotoxicity. Many past studies suggest the role of antioxidant (vitamin-E) in treatment of oral mucosal lesions particularly includes oral leukoplakia, oral lichen planus, oral submucous fibrosis and oral cancer. Vitamin-E as an antioxidant helps in prevention and slow the growth of Head and Neck cancer, improve the effects of cancer chemotherapy and reduce the side effects from both chemotherapy and radiation therapy for cancer patients. As prevention modality use of Vitamin-E may be beneficial for human beings.

Introduction

Vitamin-E is the collective term for a family of chemical substances that are structurally related to alpha-tocopherol. Vitamin E occurs naturally in eight different forms: four tocopherols, alpha (α)-, beta (β)-, gamma (γ) - and delta (δ) tocopherol and four tocotrienols, alpha-, beta-, gamma- and delta-tocotrienol. All of these forms consist of a chromanol ring with a long aliphatic side chain, bound to the chromanol ring at the second position. [2].Vitamin-E exhibit antioxidant properties by acting as a lipid-soluble free radical scavenger in cell membranes. Thus, Vitamin-E may involve in both initiation and promotion stages. Among the other potentially anticarcinogenic effects of Vitamin E are its ability to inhibit formation of the carcinogenic chemical nitrosamine from nitrites in some foods, and its ability to promote immune system function [3].

ROLE OF VITAMIN E IN PREVENTION OF ORAL CANCER

1.Inhibits oral cavity carcinogenesis.2. Reduces the risk of developing oral cancer.3. Causes reversal of premalignant lesion like oral leukoplakia. Tocoferol (AT) is the commonest and most active form of vitamin-E. It is found in plant oil, margarine, and green leaves. Tocoferol is an effective antioxidant at high levels of oxygen, protecting cellular membranes from lipidic peroxidation. Main actions of AT includes;

• Free radical scavenging

• Maintenance of membrane integrity

• Immune function

• Inhibition of cancer cell growth/differentiation

• Cytotoxicity

• In hibits mutagenicity and nitrosamine formation

• In hibition of DNA and RNA, protein synthesis in cancer cells.[4]

recommended use of Vitamin-E as an antioxidant in oral lesions. Vitamin-E can inhibit reactions of the tobacco specific nitrosamine (carcinogens) which undergo specific activation and detoxification process. Antioxidants such as β carotene, provitamin A, vitamin-C, vita-

min-E, zinc, selenium and spirulina are believed to have a preventive role against oral cancer. Rai Balwant [5] reported in his study, the role of Vitamin-E in oral cancer. Antioxidant defences (vitamin-E and C) are compromised and oxidative stress is increased in patients with oral cancer. A weak antioxidant defense system makes the mucosal cells more vulnerable to the cytotoxic effect of reactive oxygen species. This creates in intracellular environment more favourable for DNA damage and disease progression. So, antioxidant supplement (vitamin C and E) may have role in oral cancer patients. Sumit Bhateja [6] highlighted the role antioxidants in oral mucosal lesions. The evidence in support of a chemopreventive role for the so called antioxidant nutrients, beta-carotene and Vitamin-E, against oral cavity cancer.

CONCLUSION

Vitamin-E is an essential nutrient that is receiving growth attention in the prevention of precancerous lesions because of its anti oxidant properties. The main natural sources of vitamin are fresh vegetables, vegetable oils, cereals and nuts. Evidence is increasing that free radical reaction are implicated in the development of degenerative diseases. The body's susceptibility to free radical stress and related damage is associated with the overall balance between the stress level and the antioxidant potential of body tissue. It may be prudent to increase the intake of Vitamin-E and other antioxidant to prevent the body from the increasingly high levels of free radicals derived from the environment and from endogenous sources. Beneficial effect of Vitamin-E in controlling free radical damage in biological system should be most apparent when taken a long term basis. Oral cancer is generally preceded by precancerous lesions which include leukoplakia, lichen planus, oral submucous fibrosis, oral epithelial dysplasia, erythroplakia. The major risk factor of pharyngeal cancer is tobacco and alcohol in Asian countries chewing tobacco, betal nuts, are major risk factors. In these above lesions Vitamin-E as an antioxidant plays preventive role.

References

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