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CAROTENE IN ORAL SQUAMOUS CELL  
CARCINOMA - A REVIEW**

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**ROLE OF BETA CAROTENE IN ORAL SQUAMOUS CELL CARCINOMA - A REVIEW:**

**ABSTRACT:**

*Oral squamous cell carcinoma (OSCC) is the most well-known malignant growth of the head and neck. It represents over 90% of all malignancies which happen in the head and neck region. The high frequency and mortality rate of oral cancer energizing continuation of exploration on finding new indicative diagnostic tools or markers for it. Oral squamous cell carcinoma (OSCC) is the 6th most common threat in the world. It is brought about by an assortment of elements, among which, oxidants, the results of typical digestion, rank high as a significant culprit in the development of the disease.*

**Key words:** *Beta carotene, Squamous cell carcinoma, Antioxidants, Biomarker*

**1. Introduction:**

Oral cancer is the 6th most common disease overall <sup>[1]</sup>. Over 90% of all oral cancer are squamous cell carcinoma (SCC) <sup>[2,3]</sup>. The most significant danger factors for oral SCC are usage of tobacco or betel quid and the continuous drinking of alcohol. A diet with low in leafy vegetables and fruits also been accepted in aetiopathogenesis of oral SCC <sup>[1,4]</sup>. The most elevated incidence and prevalence of oral SCC is found in the Indian subcontinent where the danger of creating oral SCC is expanded by the common propensities for chewable tobacco, betel quid and areca-nut <sup>[2]</sup>. The mutagenic impacts of tobacco, liquor, betel quid or areca-nut are dependant upon quantity, upon recurrence endless supply of utilization, and are quickened and exaggerated by the simultaneous utilization of at least two of these agents <sup>[4]</sup>.

**2. Beta carotene:**

$\beta$ -carotene, is a potential antioxidants, has a possible function in counteraction of oral malignancy <sup>[5]</sup>. Studies have uncovered that low degrees of  $\beta$ -carotene might be one of the significant causative variables of OSCC <sup>[6]</sup>. Thus, its supplementation at a premalignant stage will maybe forestall the change of such injuries into OSCC. In the course of recent decades, huge experience has been picked up from different malignancy contemplates, which have prompted the acknowledgment of the huge function of the  $\beta$ -

carotene and its connection with different tumors. Nonetheless, contemplates which anticipate exact importance of the serum  $\beta$ -carotene levels with OSCC are restricted. Consequently, this examination was attempted with a plan to assess the conceivable function of serum  $\beta$ -carotene as a biochemical boundary in the diagnosis of OSCC.

### 3. Biochemical marker:

During carcinogenesis, there might be either an up-regulation or down regulation of numerous biochemical substances. With the improvement of new and delicate procedures for estimating exact minute amounts of these biochemical substances, presently, it is conceivable to recognize early harmful change of the cells [7]. The assurance of these biochemical substances contributes extensively to diagnosis of malignancy [8,9]. In any case, a dominant part of these are distinguished either in cell lines, or in biopsy examples, in this manner making it trying for large scale screening. Estimation of these biochemical substances in serum might help being developed of a valuable practical screening apparatus [10]. One such biochemical marker is serum  $\beta$ -carotene. These blood-based tests are engaging from a few perspectives, including their simplicity, lesser invasiveness, lesser time utilization, ease of understanding, in being efficient yet very corroborative for determination of OSCC and its prognosis [11].

### 4. Natural Resources:

$\beta$ -carotene is the most naturally available carotenoid with both provitamin A and antioxidant properties. It is found green, orange, or yellow vegetables, for example, carrots, sweet potatoes, and orange, and in orange fruits like apricots, papaya, mangos, and melons. Accessibility of  $\beta$ -carotene as a supplement is an additional favorable position, since it permits supplementation by dietary modifications. It is equipped for restraining carcinogenesis at both the early and late phases of malignancy [12]. It produces healthy consequences for cell-separation, immunologic capacity and collaboration of cells with development factors, e.g., epidermal development factor (significant in malignant growth hindrance exercises) [12]. In this way, its supplementation, either as dietary modifications or as  $\beta$ -carotene-containing supplements, at premalignant stages, will maybe forestall the change of such injuries into OSCC. Diminished degrees of serum  $\beta$ -carotene have been seen in patients with different malignancies [13]. Be that as it may, writing search has uncovered just a couple of studies which have related serum  $\beta$ -carotene and oral malignant growth.

### 5. Conclusion:

Taking everything into account, various lines research propose an expected function for beta-carotene and other antioxidants in forestalling oral cavity malignancy, getting from a wide scope of speciality, including the study of disease transmission, lab studies, pharmacology and clinical mediation preliminaries. Low levels of  $\beta$ -carotene might be a significant co-factor during the process of carcinogenesis. Therefore, possibly,  $\beta$ -carotene assessment can be consolidated in the variety of tests which are accomplished for conclusion of oral malignancy and as a subordinate to other tumor markers.

### 6. References:

- [1] J. P. Shah and Z. Gil, "Current Concepts in Management of Oral Cancer-Surgery," *Oral Oncology*, Vol. 45, No. 4, 2009, pp. 394-401.
- [2] E. Attar, S. Dey, A. Hablas, I. A. Seifeldin, M. Ramadan, L. S. Rozek and A. S. Soliman, "Head and Neck Cancer in a Developing Country: A Population-Based Perspective Across 8 Years," *Oral Oncology*, Vol. 46, No. 8, 2010, pp. 591-596.
- [3] J. Bagan, G. Sarrion and Y. Jimenez, "Oral Cancer: Clinical Features," *Oral Oncology*, Vol. 46, No. 6, 2010, pp. 414-417.
- [4] S. Petti, "Lifestyle Risk Factors for Oral Cancer," *Oral Oncology*, Vol. 45, No. 4, 2009, pp. 340-350.
- [5] Bertram JS, Bortkiewicz H. Dietary carotinoids inhibit neoplastic transformation and modulate gene expression in mouse and human cells. *Am J Clin Nutr*. 1995;62(suppl):1327S–36S.

- [6] Reddy GVR, Vasudha KC, Lakshmaiah M, Kumar AN. Estimation of serum  $\beta$ -carotene levels in oral carcinoma. *JIAOMR*. 2005;17(04):157–60.
- [7] Bathi R J, et al. Evaluation of glycoproteins as prognosticators in head and neck malignancy. *Cancer*. 1991;67:135–40.
- [8] Vinzenz K, Schonthal E, Zekert F, Wunderer S. Diagnosis of head and neck carcinomas by means of immunological tumor markers. *J of Cranio Max Fac Surg*. 1987;15:270–277.
- [9] Anil S, Beena VT, Nair RG, Vijayakumar T. Evaluation of serum  $\beta$ 2- microglobulin in premalignant and malignant lesions of the oral cavity. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 1995;79:750–2.
- [10] Sharma M, Bairy I, Pai K, Satyamoorthy K, Prasad S, Berkovitz B. Salivary IL-6 levels in oral leukoplakia with dysplasia and its clinical relevance to tobacco habits and periodontitis. [online] *Clin Oral Invest*. 19 June 2009
- [11] Kinnari BR, Prabhudas SP, Jyothi GC, Raksha MS. Clinical significance of total & Lipid bound sialic acid levels in oral precancerous conditions and oral cancer. *J of Oral Pathol and Med*. 2005;34(5):263–67.
- [12] Garewal HS. Potential role of  $\beta$ -carotene in prevention of oral cancer. *Am J Clin Nutr*. 1991;53:294S–7S.
- [13] Wald NJ, Thompson SG, Densem JW, Boreham J, Bailey A. Serum beta-carotene and subsequent risk of cancer: results from the BUPA study. *Br J Cancer*. 1988;57:428–33.