

Oral Cancer Prevention Strategies: A Great Deal Remains to be Done

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INTRODUCTION

Oral cancer is a global challenge, with a high degree of mortality ~50%.¹ Oral cancer is graded as the sixth most widespread malignancy in South Asia—with approximately 300,000 recent cases identified annually, accounting for one-third of the overall cancer burden in India.² The key risk factors linked with oral cancer are tobacco use and alcohol consumption, having a dose-response association, and synergistic effect.³ Other trivial factors being UV /sunlight, diet and nutritional status, chronic candidal infection, Human papilloma virus [HPV], Herpes simplex virus, Hepatitis-C virus, Epstein-Barr Virus, and immune deficiency.^{4,5}

In spite of effortless access to examination, oral cancers presentation is delayed with devastating consequences on survival and quality of life.¹ Hence the chief goal should be to emphasis on preventive measures so that mortality due to oral cancer is diminished and is in control.

CANCER PREVENTION STRATEGIES

Cancer prevention strategies can be charted into three stages:

- **Primary prevention:** The purpose of primary preventive measure is to upsurge public understanding about the risk factors and aspires at modifying the behaviors of public. From the habit initiation to development of potentially malignant disorders [PMDs] takes roughly 1–5 years and all individuals particularly those susceptible to development of tobacco abuse should be counselled about ill-effects of tobacco and those already abusing tobacco should be counselled to quit the habit. Oral health care providers play a significant role in detection of oral cancer and in educating subjects who are at risk of oral cancer. Hence oral screening, counselling to avoid exposure to carcinogens and life style changes, oral self-examination plays a key role in prevention. Maintaining a healthy body weight, being physically active, having a healthy diet, reducing alcohol intake considerably decreases the cancer risk, and at the same time reduced contact to environmental pollutants or carcinogens in the place of work is also important; nonetheless, all these actions should be comprehended in regulatory actions on for example taxation and price policies on tobacco, alcohol or unhealthy foodstuffs.⁶ Other professional screening approaches utilized for early detection and estimation of oral cancer include OralCDx, Vizilite, VizilitePlus, Micolux/DL, Orasoptic DK, and VELscope.⁵ HPV vaccination trials are still under research but have shown encouraging results for the prevention of oral HPV infection and oral cancers.⁷

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- **Secondary prevention:** Aims at identifying the malignant lesions promptly using screening techniques and decelerating, hindering, or reversing progression of carcinogenesis to invasive cancer. Increased public awareness of early symptoms of PMDs as well as knowledge of health care providers about these lesions would advance early detection, rise cure rates and reduce treatment-related morbidity.⁸ Salivary biomarkers as L-phenylalanine, angiogenetic marker like Cluster of differentiation factor 34 [CD34], Genomic biomarkers such as integrin $\alpha 3$ and integrin $\beta 4$, Cloning of an acidic laccase gene 2 which is a proteomic biomarker aid in timely diagnosis, monitoring and delineation of oral cancer. Chemoprevention is a ground-breaking system to inverse, alleviate, or stop progression of PMDs. Promising agents for chemoprevention of oral cancer include β -carotene, retinoids, N-acetyl cysteine, NSAID's, Vitamin-E, retinoids, curcumin, and green tea.^{5,9–11}
- **Tertiary prevention:** Intends to prevent the resurgence of oral cancers in patients. Consistent post-treatment follow-up is extremely important in patients after therapeutic care of oral cancers in order to find recurrence, detect a second primary and/or complications of treatment.¹¹ Cancer vaccines are an alluring complementary immunotherapeutic possibility with both prophylactic and therapeutic abilities. Messenger RNA is a potent and flexible cancer vaccine platform. Its efficacious progress toward clinical translation will remarkably bolster our capability to tackle cancers.¹²

To summarize oral cancer prevention strategies, include oral screening, exposure modification [tobacco cessation], cancer immunotherapy/vaccination, chemoprevention, treatment or removal of PMDs, risk-reducing surgery to remove tissue at risk, and screening and early-detection methods based on molecular biomarkers. All these will certainly lead to valuable strategies to

reduce the incidence, morbidity and mortality of oral cancers in the near future.

REFERENCES

1. D'Cruz AK, Vaish R. Risk-based oral cancer screening - lessons to be learnt. *Nat Rev Clin Oncol* 2021;18(8):471–472. DOI: 10.1038/s41571-021-00511-2
2. Seenan P, Conway D. Smokeless tobacco - a substantial risk for oral potentially malignant disorders in South Asia. *Evid Based Dent*. 2017;18(2):54-55. DOI: 10.1038/sj.ebd.6401242. PMID: 28642557.
3. Ogden GR, Macluskey M. An overview of the prevention of oral cancer and diagnostic markers of malignant change: 1. Prevention. *Dent Update* 2000;27(2):95–99. DOI: 10.12968/denu.2000.27.2.95. PMID: 11218278.
4. D'souza S, Addepalli V. Preventive measures in oral cancer: an overview. *Biomed Pharmacother* 2018;107:72-80. DOI: 10.1016/j.biopha.2018.07.114. Epub 2018. PMID: 30081204.
5. Lippman SM, Sudbø J, Hong WK. Oral cancer prevention and the evolution of molecular-targeted drug development. *J Clin Oncol* 2005;23(2):346–356. DOI: 10.1200/JCO.2005.09.128
6. Meyskens FL Jr, Mukhtar H, Rock CL, et al. Cancer prevention: obstacles, challenges and the road ahead *J Natl Cancer Inst* 2015;108(2):djh309. DOI: 10.1093/jnci/djh309. PMID: 26547931; PMCID: PMC4907357.
7. Schüz J, Espina C, Wild CP. Primary prevention: a need for concerted action. *Mol Oncol* 2019;13(3):567–578. DOI: 10.1002/1878-0261.12432. Epub 2019. PMID: 30582778 PMCID: PMC6396360.
8. Foy JP, Bertolus C, William WN Jr, et al. Oral premalignancy: the roles of early detection and chemoprevention. *Otolaryngol Clin North Am* 2013;46(4):579–597. DOI: 10.1016/j.otc.2013.04.010. Epub 2013. PMID: 23910471; PMCID: PMC3734384.
9. Neetha MC, Panchaksharappa MG, Pattabhiramasasthy S, et al. Chemopreventive synergism between green tea extract and curcumin in patients with potentially malignant disorders: a double-blind, randomized preliminary study. *Contemp Dent Pract* 2020;21(5):521–531. DOI: 10.5005/jp-journals-10024-2823. PMID: 32690834.
10. Dunn BK, Greenwald P. Cancer prevention I: introduction. *Semin Oncol* 2010;37(3):190–201. DOI: 10.1053/j.seminoncol.2010.06.011. PMID: 20709204.
11. Maresso KC, Tsai KY, Brown PH, et al. Molecular cancer prevention: current status and future directions. *CA Cancer J Clin* 2015;65(5):345–383. DOI: 10.3322/caac.21287. Epub 2015. PMID: 26284997; PMCID: PMC4820069.
12. Miao L, Zhang Y, Huang L. mRNA vaccine for cancer immunotherapy. *Mol Cancer* 2021;20(1):41. DOI: 10.1186/s12943-021-01335-5. PMID: 33632261; PMCID: PMC7905014.

