headandneck 5000

Investigating the predictive role of epigenetic markers of smoking, drinking and epigenetic age in Head and Neck 5000

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Scientific Outline

Summary

Tobacco and alcohol consumption are the most important risk factors for the development of head and neck cancer (HNC), but the role of these behaviours on survival has yet to be fully elucidated. The findings of previous studies in this area have been limited by their use of self-reported smoking and drinking, which are prone to measurement error and reporting bias. The first aim of this study is to use previously identified DNA-methylation biomarkers of tobacco and alcohol use, which provide a much more reliable measure of exposure than self-reports, to examine the prognostic role of pre-treatment smoking and drinking in oropharyngeal cancer (OPC). The second aim of this study is to assess whether epigenetic age, a DNA-methylation-based estimate of biological age that has been shown to predict age-related diseases, all-cause and cause-specific mortality, is associated with OPC survival in H&N5000. Finally, we will assess whether prognostic models that include methylation biomarkers of tobacco and alcohol use and epigenetic age improve the accuracy of prediction, compared to standard models based on TNM staging and self-reported tobacco and alcohol use. The results of this study may help improve OPC prognostication and clinical decision making, by helping to identify individuals who are most at risk of cancer progression.

Key words: tobacco, alcohol, methylation, epigenetic age, oropharyngeal cancer, prognosis.