Using DNA methylation from saliva for outcome prediction in oral cancer

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Summary:

This joint project with Head and Neck 5000 sits within the University of Bristol's Integrative Cancer Epidemiology Programme (ICEP) funded by CRUK which aims to reduce the burden of cancer through the identification of causal risk factors, mechanistic targets and predictive biomarkers.

Even for early-stage mouth cancer, 5-year survival rates remain poor and recurrence remains a major issue. Treatment often involves extensive surgery alongside chemoradiotherapy, resulting in life-changing physical and psychological consequences. This also makes cancer recurrence difficult to detect due to post-surgery and post-radiotherapy changes to the lining of the mouth. No tests currently exist to predict recurrence or death in this disease.

As saliva bathes the whole oral cavity, it may be a better predictor of mouth cancer outcomes than the current practice of visual screening and carrying out repeated biopsies. While epigenetic changes do not directly alter DNA code, they can still influence the function of genes involved in cancer. The Head and Neck 5000 cohort provides a large collection of saliva samples from mouth cancer patients which may be used for epigenetic (DNA methylation) profiling. We therefore aim to identify biomarkers to predict mouth cancer recurrence and survival outcomes in saliva, which could potentially offer a minimally invasive, real-time follow-up test for this disease. We will also investigate whether epigenetics can be used to indicate which patients may benefit from less aggressive treatment, thereby reducing the potential side effects and any potential drug targets to help manage recurrence.

Keywords

Epigenetic, DNA, methylation, biomarker, prognostic, recurrence, survival, oral cavity, mouth, cancer