Specificity of a non-invasive oral cancer test in patients with oral cavity and oropharyngeal cancers

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We aimed to test a panel of microRNA using a non-invasive salivary based method, which has previously been demonstrated to differentiate OSCC from normal controls with high accuracy, against a new group of oral and oropharyngeal SCCs. A cohort of 28 individuals with oropharyngeal SCC, 6 with p16+ unknown primary SCC and 45 with oral SCC were compared with a group of controls. The control cohort consisted of patients referred to Head and Neck Cancer clinic with upper aerodigestive tract complaints and subsequently found to have benign lesions and inflammatory conditions, with no evidence of malignancy. Oral swirls were collected from each participant in the pre-treatment phase and analysed against the established panel of microRNAs (miRs -24, -21, -31, -100, -125b and let-7c with miR-99a as a housekeeping control) as well as additional microRNAs from a literature review (miRs -9, -92a, -134 and -222). miR-92a was found to be significantly different in p16+ SCC compared to the control group ($p < 0.05$), while miR-24, miR-21, miR-31 and miR-100 were each individually significantly different between OSCC and controls ($p < 0.01$). A multiplex assay utilising miR-21, miR-24, miR-31 and miR-92a showed significant differences between controls and oropharyngeal SCC ($p = 0.0446$) as well as p16+ SCC ($p = 0.0197$). The previously studied multiplex of miR-24, miR-21, let-7c and miR-100 was able to distinguish OSCC from controls ($p = 0.0018$), validating its utility in oral cancer, however it could not be used to detect oropharyngeal or p16+ SCC. Development of panels that can distinguish head and neck malignancies from inflammatory conditions and benign lesions is important and this study shows that differences can be seen between these groups using salivary microRNA.