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The role of human papilloma virus (HPV) in oropharyngeal squamous cell carcinoma: a clinicopathologic and molecular analysis

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ABSTRACT

Context: Human papillomavirus (HPV) is an established aetiology in a subset of oropharyngeal squamous cell carcinoma (OPSCC). However, literature on the association between HPV and OPSCC in the African context is lacking.
Objective: To determine the association of HPV in OPSCC and to correlate it with the clinicopathologic and molecular analysis.
Design: A total of 60 OPSCCs were evaluated with HPV *in-situ* hybridisation (HPV ISH) and immunohistochemistry (IHC) for p16, p53 and Ki67. This was correlated with the site of occurrence of the tumours, the patients' smoking and alcohol usage and microscopic features of tumours (NKSCC;*n*=30 and KSCC;*n*=30).
Results: HPV DNA was found in 24/60 (40%) cases. HPV16, was positive in 18/60 (30%) cases and HPV6 in 8/60 (13.3%) tumours. Two of the 60 (3.3%) cases were positive for both HPV16 and HPV6. HPV positive (+ve) tumours occurred more in males (*n*=22; 73%) than females (*n*=7; 23%); median age: 62.5 years. The primary tumour sites were the tonsil (*n*=7; 11.6%) and posterior tongue (*n*=6; 10%). Of the NKSCCs, 11 (36.7%) were HPV16+ve and 8 (26.7%) HPV6+ve. Seven (23.3%) KSCC were HPV16+ve and none (0%) HPV6+ve. Of the 24 HPV+ve tumours, 13 (54.1%) were p16+ve and 14 (58.3%) were p53+ve. Three (12.5%) tumours exhibited the molecular phenotype: p16+ve in > 70% of tumour cells, a low (<25%) to negative p53 staining and high Ki67 (>25%) proliferation index.

Conclusion: HPV positive OPSCC is seen more in older male patients. The distinct molecular phenotype, (p16 positive, low p53, high KI67) highlights tumours that are of true viral aetiology. In this study, the low p16 IHC stain sensitivity towards HPV ISH positive tumours infers that p16 is less reliable when used alone as a surrogate marker for HPV associated OPSCC. Therefore, in OPSCC with a high suspicion for HPV and which display a basaloid and non-keratinising morphology, a negative p16 IHC stain should be followed by other molecular techniques such as HPV ISH.