

ABSTRACT

The Detection of all High Risk Human Papilloma Virus DNA in Archival Formalin-Fixed Paraffin-Embedded Cervical and Head and Neck Squamous Cell Carcinoma Tissue using Immunohistochemistry and Polymerase Chain Reaction

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High-risk human papillomaviruses (HR-HPV) are causally implicated in squamous cell cervical cancer (CIN/SCC) and about 25% of head and neck squamous cell cancers (HNSCC). A retrospective case-control study and a site-specific retrospective cohort study were performed to investigate this association in archival formalin-fixed paraffin-embedded (FFPE) tissue in CIN/SCCs diagnosed in the Department of Pathology, UWI (DPUWI), between 2002 and 2004, and HNSCCs diagnosed in the DPUWI and the National Public Health Laboratory between 2001 and 2010. Clinical information was extracted for HNSCC patients from the UWI to assess for possible risk factors and patient outcome related to HPV status.

Analyses were done by immunohistochemistry (IHC) using P16^{INK4A} clone E6H4 mouse anti-human protein, and by standard polymerase chain reaction (PCR) using MY09/MY11 consensus primers of the L1 HR-HPV gene. P16^{INK4A} is over-expressed in HR-HPV infection and is a surrogate marker of its presence. The majority of the 74 cervical cancer cases (97%) were p16 positive. HPV16 was the most common genotype overall (54%), and in the cases only (73%). Single-type HR-HPV infection was found in 65% of cases, and the most common HR-HPV types in descending order of frequency were 16, 31, 33, 18, 39, 68, 73, 52, 56 and 45.

The 331 HNSCC cases showed 21.8% p16-positivity, with anatomical site-positivity being: the mouth (28.9%), oropharynx (23.8%), nasopharynx (22.2%), tongue (21.6%), larynx (19.9%) and pharynx (12.5%). Nine (6.8%) of 132 HNSCCs analysed were successfully genotyped; all showed HPV 16. Clinical variables derived were small, showed no significant statistical correlations with HPV status, and the overall trend was that older patients had a greater tendency of dying from HNSCC.

This study validates the use of p16 IHC and PCR in detecting HR-HPV in our FFPE cancer tissues, and confirms the strong association of HPV16 in CIN/SCCs and HNSCCs diagnosed at the UWI and NPHL.

Keywords: Sharon Rosemarie Harrison; Human Papillomavirus; cervical cancer; Immunohistochemistry; Polymerase chain reaction; p16INK4A; Head and neck squamous cell cancer; Carcinoma; formalin-fixed paraffin-embedded tissue; pathology; case-control study.