Prevalence of Human Papillomavirus in Young Non-nasopharyngeal Head and Neck Squamous Cell Carcinoma in Patients at The King Chulalongkorn Memorial Hospital

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Background: HPV-associated head and neck squamous cell carcinoma (HNSCC) seems to increase during the last decades and has been commonly described to associate with younger patients. However the true prevalence of HPV in this specific population remains unclear.

Objective: The aim of this study is to determine the prevalence of HPV in HNSCC reference to young patients and find an association between HPV status and clinical outcome.

Method: We collected archival 56 paraffin-embeded tumor tissue samples from HNSCC patients diagnosed and treated at The King Chulalongkorn Memorial Hospital between 2000 and 2010. The major inclusion criterion was the age at diagnosis less than 45 year-old. The HPV status was determined by HPV polymerase chain reaction (PCR) with degenerated primers covered over 37 HPV serotype including high risk HPV 6, 11, 16, 18, 31 and 33. Additional immunohistochemical stain (IHC) of p16 was performed. The clinicopathological correlations with HPV status were analyzed.

Results: Fourteen (25%) of the 56 HNSCC samples exhibited HPV DNA by PCR. Among cancer sites, 7 of 23 (30%) of oral cavity, 3 of 11 (27%) of oropharynx and 4 of 22 (18%) of hypopharynx and larynx primary organs displayed HPV DNA in tumor tissue. There was no major difference in demographic data, tumor characteristic and treatment modalities between HPV DNA-negative and HPV DNA-positive samples. Survival analyses indicated that HPV DNA-positive tumors tend to have better 2 year overall survival compared with HPV DNA-negative tumors, 66 and 40 percent respectively (p=0.10). However, After adjusted for independent prognostic variables of cigarette smoking, alcohol consumption, site of primary tumor and nodal status, only HPV DNA status was a predictor for better survival (HR 0.16; 95%CI, 0.01-0.66). Additional experiment IHC for p16 expression revealed 8 of 48 (16%) of p16 overexpression which had twenty-two percent concordant rate with HPV PCR (kappa 0.22, p = 0.11).

Conclusion: We found a moderate prevalence of HPV in young non-nasopharyngeal HNSCC patients. The presence of HPV genome correlates with a significantly better in this subset of HNSCC. The low concordant rate between HPV-DNA and p16 overexpression in this young HNSCC population may caution the use of p16 overexpression as a surrogate marker of HPV.