



## PREVALENCE OF HUMAN PAPILLOMA VIRUS IN HEAD AND NECK CARCINOMA

Dr Akshay Sharma<sup>1</sup>, Dr Sonam Tyagi<sup>2</sup>, Dr Saddam<sup>3</sup>

<sup>1</sup>MDS, Assistant Professor, Department of Dentistry MSY Medical College NH 235 Meerut Hapur Road Meerut

<sup>2</sup>BDS, J R Department of Dentistry MSY Medical College NH 235 Meerut Hapur Road Meerut

<sup>3</sup>BDS, J R Department of Dentistry MSY Medical College NH 235 Meerut Hapur Road Meerut

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Corresponding author: Dr Akshay Sharma

### Abstract:

**Background:** Growing evidence suggests a role for human papillomavirus (HPV) in oral cancer; however its involvement is still controversial. This study evaluates the frequency of HPV DNA in oral cancer cases.

**Aim:** to evaluate the frequency of HPV DNA in oral cancer cases and report association, if any.

**Materials and Methods:** We performed a hospital-based, case-control study of 100 patients with newly diagnosed oropharyngeal cancer and 200 control patients without cancer to evaluate associations between HPV infection and oropharyngeal cancer. Results were statistically analyzed.

**Results:** A high lifetime number of vaginal-sex partners were associated with oropharyngeal cancer as were a high lifetime number of oral-sex partners. The degree of association increased with the number of vaginal-sex and oral-sex partners. Oropharyngeal cancer was significantly associated with oral HPV type 16 infection

**Conclusion:** Oral HPV infection is strongly associated with oropharyngeal cancer among subjects with or without the established risk factors of tobacco and alcohol use.

**Keywords:** carcinoma, mortality, oropharyngeal, vaccine, preventive

### Introduction

Studies conducted during the last years, using new technologies for viral detection, permit to consider human papillomavirus (HPV) an etiologic factor for cervical cancer. Besides the relation to genital regions, other anatomic sites have been associated with HPV, including head and neck regions.

Oral and oropharyngeal cancer is nowadays well correlated with tobacco and alcohol abuse, and some studies have also shown the prevalence of lower lip cancer due to chronic sun exposure.[1-3] Besides, other factors might be associated with the development of oral and oropharyngeal malignancies; among them, cytomegalovirus, herpes virus and human papillomavirus (HPV) have been indicated as probable oncogenic agents. [4,5]

Although HPV is the major etiologic factor for cervical cancer, the real role of this virus in oral carcinogenesis has not yet been clearly defined and is thus attempted in the current research.

### Materials & Methods

This study was carried out on patients with newly diagnosed squamous-cell carcinomas of the head and neck in the outpatient department of Sri Sai hospital, Moradabad. Eligible case patients included those with

a confirmed diagnosis of oropharyngeal squamous-cell carcinoma. The control group consisted of patients without a history of cancer who were seen for benign conditions in the same department from which the case patients were enrolled.

All patients were interviewed about demographic characteristics, oral hygiene, medical history, family history of cancer, lifetime sexual behaviors, and lifetime history of marijuana, tobacco, and alcohol use. Specimens were collected from case patients before therapy and from control patients at enrollment. Oral-mucosal specimens were collected with the use of a saline oral rinse and 5 to 10 strokes of a cytology brush on the posterior oropharyngeal wall. Serum samples were collected and stored at -80°C. For case patients, formalin-fixed, paraffin-embedded tumor specimens and, if possible, snap-frozen fresh tumor specimens were obtained for the detection of HPV.

We analyzed purified DNA for 37 types of HPV by means of a multiplex polymerase-chainreaction (PCR) assay. The data was statistically analyzed using SPSS version 18 and represented in tables and graphs for ease in understanding.

## Results

We enrolled 130 consecutive patients with newly diagnosed oropharyngeal cancer in and 100 patients (77%) agreed to participate. Approximately 70% of eligible control patients (200) agreed to participate.

The association with oropharyngeal cancer increased significantly with the number of vaginal sex partners or oral-sex partners (P for trend = 0.002 and 0.009, respectively) and was markedly elevated among patients with a high lifetime number of such partners.

Oropharyngeal cancer was also strongly associated with serologic measures of exposure to HPV-16 and with the presence of oral HPV infection.(table 1)

To explore whether the association between sexual behaviors and oropharyngeal cancer could be explained by HPV-16 exposure, we reevaluated the associations using multivariate models after adjusting for HPV-16 L1 serologic status. In this analysis, sexual behaviors were no longer significantly associated with oropharyngeal cancer. (Table 1)

**Table 1:** Shows the variables and their association in both the groups in this study

Variable	Patients with Oropharyngeal carcinoma	Patients without Oropharyngeal carcinoma
<b>Gender</b>		
Female	14	28
male	86	172
<b>Oral warts</b>		
Yes	07	04
No	93	193
<b>Genital warts</b>		
Yes	14	20
No	86	180
<b>Sexual partner with genital warts</b>		
Yes	03	17
No	94	180
Not sure	03	03
<b>Tobacco consumption</b>		
No	44	120
Yes	56	80
<b>Sexual history with partner of HPV associated cancer</b>		
Yes	05	02
No	84	190
Not sure	11	08

## Discussion

Evidences that HPV could be related to carcinogenesis were first described by Syrjänen *et al*, in 1983, when they noticed morphological alterations in cervical SCC samples suggesting the presence of HPV in 16 of 40 analyzed fragments. [5] Since then, several studies have been carried out aiming at the detection of HPV in malignant lesions of genital and oral mucosas, with prevalence rates ranging from 0% to 100%. This wide variability reported in the literature might be due to the differences in populations, sample processing and HPV detection methodologies of each study. [6-9] Recently, over 200 HPV types have been identified in many different human lesions, being categorized as low- and highrisk

HPVs, depending on their potential to lead the epithelium to carcinogenesis. In the oral cavity, low-risk HPV types 6 and 11 are the most prevalent in benign lesions, as the high-risk types 16 and 18 are respectively the most found in malignant ones.

This study investigated the presence of HPV DNA in cases of oro-pharyngeal cancer and normal samples (controls) in patients from India. HPV was detected in almost 50% of the oral lesions included in this study. HPV 6, 11 and 16 were the most prevalent in HPV-associated benign oral cancer lesions. This was in contrast to other authors who have shown the predominance of HPV18 and the relative absence of HPV16 in oral lesions in patients from some European regions.[10,11 ] Considering the geographical

influence on HPV type distribution, the World Health Organization has recommended further studies to investigate and acquire further knowledge on different HPV types' prevalence, not only in the anogenital tract but also in skin and the aerodigestive tract. This epidemiologic information may be considered for HPV prevention strategies applying prophylactic vaccines which are being licensed [12]. HPV was not detected in this series of control samples; this is consistent with other studies that revealed a very low HPV positivity in the control group [13,14]

### Conclusion

Based on our results we provide a rationale for HPV vaccination in both boys and girls — since oropharyngeal cancers occur in men and women. If vaccination is as effective in preventing oral HPV-16 infection as it is in preventing cervical infection, a substantial reduction in the incidence of oropharyngeal cancer in vaccinated populations would provide the ultimate evidence of causality.

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