

Frequency of human papilloma virus in patients with oesophageal squamous cell carcinoma in Khyber Pakhtunkhwa

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Abstract

To determine the frequency of human papilloma virus (HPV) in patients with oesophageal squamous cell carcinoma. A descriptive, cross-sectional method was adopted and the study was conducted in the histopathology department of Rehman Medical Institute, Peshawar, Pakistan, from January to June 2017, and included patients with Oesophageal squamous cell carcinoma. Non-probability consecutive sampling technique was used. SPSS v.22 was used for data analysis. Out of 121 patients, 67(55.37%) were male and 54(44.62%) were female. The overall mean age was 50±1.72 years. Most of the patients were in the age group of over 50 years and only 12% were in the age group below 40 years. In our study patients with oesophageal squamous cell carcinoma, human papillomavirus was found in 3%.

Keywords: Squamous cell carcinoma (SCC), Human papilloma virus (HPV), Oesophageal cancer.

Introduction

Worldwide, oesophageal malignancy is eighth most common type of cancer and the sixth most common cause of death.¹ Oesophageal squamous cell carcinoma (OSCC) occurs throughout the world, its frequency differs among countries, even area of a similar nation.

The annual frequency of OSCC exceeds 100 per each 1000 in northern Iran, central Asia to northern China with deaths from OSCC constituting over 20% of all cancer mortalities.

Human papillomavirus (HPV) has been postulated as a possible cause of OSCC. In 1982, a relationship between HPV and OSCC was initially suggested, when morphological similarities between HPV induced lesions in the genital tract and OSCC were obscured.³

The frequency of HPV DNA in OSCC shows a great diversity in frequency around the world, with usually high

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HPV prevalence in high-risk areas including China.⁴ Studies from North America and Europe shows a lower frequency.^{5,6}

The present study was designed to determine the frequency of HPV in newly diagnosed patients of oesophageal squamous cell carcinoma. The rationale of this study was that no local study has been conducted to determine the frequency of HPV in OSCC which has a huge geographical variation. The results of this study will provide local statistics of the magnitude of HPV in OSCC and this will open window for further research. If frequency of HPV is high in patients with OSCC in our study, it will draw the focus of general surgeons and gastroenterologists in making certain suggestions regarding HPV vaccination, screening and eradication of HPV in high-risk groups for OSCC.

Methods and Results

A descriptive, cross-sectional method was adopted and the study was conducted in the histopathology department of Rehman Medical Institute, Peshawar, Pakistan, from January to June 2017, and comprised patients with Oesophageal squamous cell carcinoma. The sample size was 121, using 27.7%⁷ proportion of HPV in OSCC with 95% confidence level and 5% margin of error under World Health Organization (WHO) software for sample size determination.⁸

Non-probability consecutive sampling technique was used as the sampling method. Patients newly diagnosed with oesophageal squamous cell carcinoma both male and female and age more than 10 years were included.

Table-1: Stratification of human papilloma virus with age and gender.

Variables	Human papilloma virus.		p-value
	Yes	No	
Age			
31-40 Years	0(0)	14(11.5%)	0.003
41-50 Years	1(0.82%)	39(32.23%)	
>50 Years	3(2.47%)	64(52.89%)	
Gender			
Male	3(2.47%)	64(52.89%)	0.002
Female	1(0.82%)	53(43.80%)	

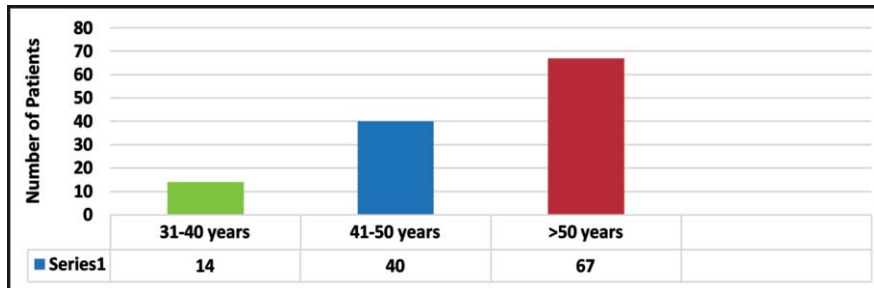


Figure-1: Age distribution of patients with ESCC.

Excluded were already diagnosed cases of OSCC OR HPV in the medical record.

The study was conducted after approval from the institutional research committee. All the new cases both admitted and OPD cases of oesophageal squamous cell carcinoma were identified and their endoscopic biopsies were included in study as per inclusion criteria.

All the biopsy specimens used for diagnosis of OSCC were processed in Rehman Medical Institute Laboratory for the detection of human papilloma virus using Dako Monoclonal Mouse Anti Human papillomavirus clone K1H8 code M3528 on formalin fixed paraffin embedded tissues. Positive and negative control was provided in the Dako kit for comparison. Antigen-antibody complex formation which imparts colour to the nuclei of neoplastic cells was taken as positive. All investigations were conducted in the same laboratory and under the supervision of single histopathologist having a minimum

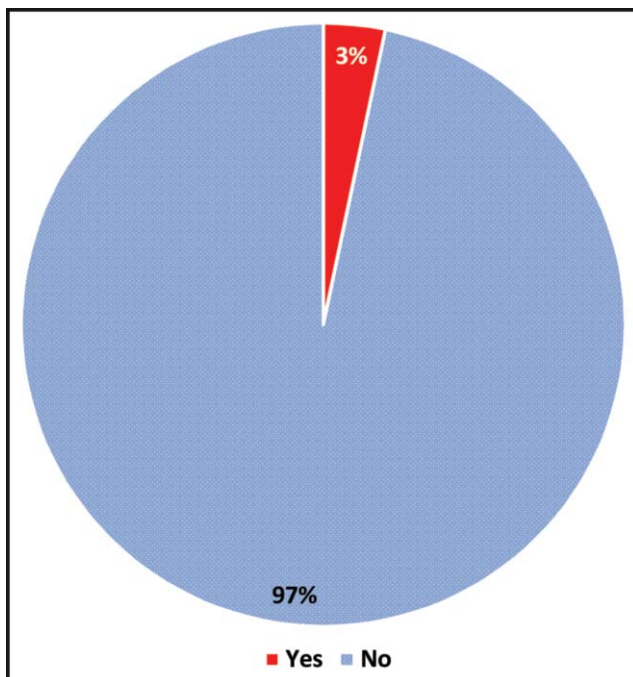


Figure-2: Proportion of patients with ESCC showing HPV. (n=121).

of five years experience. SPSS Software IBM SPSS Statistics for Windows, Version 22.0 was used for data analysis. For quantitative variables like age, the mean and standard deviation were calculated and for qualitative variables like gender and Human papilloma virus, percentages and frequencies were calculated. HPV was stratified among age and gender to see the effect

modification. Fisher's exact test was applied. P value less than (0.05) was considered significant.

A total of 121 newly diagnosed cases of oesophageal squamous cell carcinoma were included. Majority of the patients 67(55%) were male and the rest 54(45%) were female. Age ranged from 31 to 64 years with mean age of 50 ± 1.72 , most of the patients 67(55%) were in the age group of above 50 years. Age distribution of patients in our study is shown in (Figure-1).

Out of 121 patients, only 4(3%) patients were found to have Human papilloma virus while rest of 117(97%) tested negative (Figure-2).

Out of 4(3.3%), 3(2.47%) patients were male and only one (0.82%) female was positive with HPV. All males who were positive for HPV were in the age group of >50 years. On the other hand, the females were in the age group of 41-50 years. (Table-1).

Discussion

Human papilloma viruses (HPVs) is the causative agent for squamous cell carcinomas of a number of regions of the body as cervix, anogenital region, skin, upper respiratory tract, and digestive tract but it has been found mostly in oesophageal cell carcinoma in high occurrence zone. However, in oesophageal cancer HPV DNA is vastly debated.

In our study frequency of human papilloma virus (HPV) in oesophageal squamous cell carcinoma (OSCC) was 3.3%. The extensive range of HPV-OSCC infection rates mirrors the variability in the primary literature, where even large studies have reported infection rates between 0% and 78%.^{9,10} The occurrence of HPV in OSCC fluctuates between different geographical areas contrast in sampling techniques, demographic and ethnic factors and sensitivity of detection methods have been suggested to be a potential reason for the disparities in findings.¹¹ There are wide geographic differences in the overall incidence of OSCC, with high-incidence countries like China and Iran reporting one-

hundred-fold higher rates of OSCC compared with low-incidence countries like Australia and the United States.⁴ Low-incidence countries have OSCC rates of approximately 2.5 per 100,000, whereas high-incidence countries have rates as high as 250 per 100,000.⁴ Our finding of a very low prevalence of HPV DNA in ESCC tumours was like observations from many other studies conducted among populations with a low incidence of OSCC.^{9,12}

Analysis of the prevalence of HPV DNA in ESCC samples according to different clinicopathological parameters uncover that HPV was more frequently isolated in male patients. In the majority of studies, specialists did not affirm factually critical contrasts between HPV-positive and HPV-negative cases with respect to clinical and pathologic discoveries.¹³ In our study, all the males who were positive for HPV were above 50 years as compared to females who were in the age group of 41-50 years. Antonsson et al.¹⁴ reported in their study HPV-positive OSCC female were younger as compared to males while Harrera et al.¹⁵ in their study on Mexican population found that male patients were most effected with the ratio being twice more than females.

Although isolated data may recommend some relationship between HPV and aggressiveness and prognosis of OSSC, generalized and intelligible conclusions concerning the impact of HPV and its phenotypes on clinicopathological characteristics of OSCC cannot be drawn.

Conclusion

Our study concludes that although the incidence of human papilloma virus in Khyber Pakhtunkhwa is very low 3% even though the low-risk HPV phenotypes could be one of the co-activators and co-carcinogens in composite, multifactorial, progressive and multistep oesophageal carcinogenesis.

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Conflict of Interest: None to declare.

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