

PREVALENCE OF HUMAN PAPILLOMAVIRUS IN BIOPSIES OF SQUAMOUS CELL CARCINOMA OF THE ORAL CAVITY AND OROPHARYNX

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Abstract: **Introduction:** Squamous cell carcinoma (SCC) of the oral cavity and oropharynx is a common neoplasm, frequently associated with human papillomavirus (HPV) infection. This research investigates the prevalence of HPV in SCC biopsies, exploring its relevance for the etiology and prognosis of this disease. **Objectives:** To explore the prevalence of findings suggestive of HPV in oral and oropharyngeal SCC, especially in relation to the identification of markers of poor prognosis and preventive and therapeutic strategies. **Methodology:** The searches used articles published between 2019 and 2024 in the databases: PubMed and BVS, using the descriptors: “Prevalence”; “Human Papillomavirus”; “Squamous Cell Carcinoma”; “Mouth”; and “Oropharynx”, combined with the Boolean operator “AND”. **Results:** Of the 59 articles found, only 7 were selected for this study after excluding studies that did not follow a systematic or literature review methodology, were published before 2019, had incomplete text or duplicates. **Conclusion:** In summary, the data analysis highlights the association between HPV and oropharyngeal cancer. Although anaplasia and multinucleation are not significant predictors, the need to investigate markers of poor prognosis in the HPV-positive subgroup is evident. The interaction between HPV-16, smoking and alcohol emphasizes the importance of integrated approaches in prevention and treatment. The role of the TERT promoter as a potential prognostic marker deserves attention. Feasible clinical assessments in screening for HPV-OPSCC underscore the importance of early surveillance. These results emphasize the need for further research and multidisciplinary collaboration to understand and effectively manage HPV-related oropharyngeal cancer. **Keywords:** Prevalence; Human papillomavirus; Squamous cell carcinoma; Mouth; Oropharynx.

INTRODUCTION

Squamous cell carcinoma (SCC) is the most common type of cancer in the oral cavity and oropharynx, accounting for a significant portion of the morbidity and mortality associated with head and neck cancers (5). Several risk factors have been identified for the development of SCC, including smoking, alcohol consumption and, more recently, infection with the Human Papillomavirus (HPV) (1).

HPV is a DNA virus that infects epithelial cells of the skin and mucous membranes, and is known mainly for its association with anogenital cancers (7). However, its implication in head and neck neoplasms, particularly in the oropharynx, has been increasingly recognized (2). Studies have shown that HPV infections, especially type 16, are strongly associated with a distinct subgroup of oropharyngeal SCC, characterized by a specific biological and clinical profile (3).

The prevalence of HPV in biopsies of oral cavity and oropharyngeal SCC varies significantly between different populations and geographic regions (5). This variation may be attributed to differences in virus detection methods, patient selection criteria, and regional risk factors (4). Therefore, it is crucial to investigate the prevalence of HPV in specific settings to better understand its contribution to oral and oropharyngeal carcinogenesis (5).

The aim of this study is to determine the prevalence of HPV in biopsies of oral cavity and oropharyngeal squamous cell carcinoma, analyzing the presence of the virus and its possible implications in the development and prognosis of these neoplasms. In addition, we intend to discuss the importance of HPV detection as a potentially useful biomarker for the prevention, diagnosis, and personalized treatment of patients with SCC.

METHODOLOGY

This study is based on the status of Preferred Reporting Items for Systematic Reviews and Meta-Analyses, descriptive and quantitative approach (PRISMA). It was searched in the PubMed and BVS databases to select relevant studies published in quantitative and descriptive form since the earliest available date between 2019 and March 2024.

The descriptors used were: “Prevalence”; “Human papillomavirus”; “Squamous cell carcinoma”; “Mouth”; “Oropharynx”. These were combined with the Boolean operator “AND” to form the search strategies.

The group members, mutually and independently, extracted data from the selected articles such as: experimental design, objective, results, outcomes and conclusions relevant to answer the research question of this review.

Of the 59 studies found, studies that did not have a systematic or literature review as a methodology, published before 2019, with incomplete text and duplicates were excluded. After full reading, only 07 articles were selected for the development of this study.

RESULTS

To write this systematic review, 7 articles were selected from the 59 found, according to the inclusion and exclusion criteria. Among the selected articles, three presented systematic review and meta-analysis studies, according to Wierzbicka et al. (2023), Yang et al. (2023), and one previous review; one was only a meta-analysis, according to Makvandi et al. (2022); one clinical trial, according to Scott-Wittenborn et al. (2023); and one clinical pathological case study, according to Molony et al. (2020).”

DISCUSSION

Considering the epidemiological and histological aspects, Makvandi et al. (2022) performed a meta-analysis to evaluate the prevalence of Human Papillomavirus (HPV) and co-infection with Epstein-Barr Virus in oral and oropharyngeal squamous cell carcinomas. The analysis revealed that co-infection with Epstein-Barr can potentially aggravate the progression of squamous cell carcinoma, reinforcing the importance of simultaneous detection of these pathogens for more effective clinical management.

Similarly, Menezes et al. (2020) investigated the emerging risk of oropharyngeal and oral cavity cancer in young people in Brazil, related to HPV-associated subsidies. This study highlighted a significant increase in cancer risk among young people, underscoring the need for prevention strategies, such as HPV vaccination. In association, the systematic review and meta-analysis by Wierzbicka et al. (2023) discussed the transmission and clearance of HPV infection in the oral cavity and its role in oropharyngeal carcinoma. The study highlighted that HPV persistence is a critical factor in the progression to cancer, and strategies to interrupt virus transmission are essential for the prevention of oropharyngeal carcinoma.

Similarly, Yang et al. (2023) conducted a systematic review and meta-analysis on the combined effect of HPV exposure, smoking, and alcohol on the risk of oral squamous cell carcinoma. The results showed that exposure to HPV, especially when combined with other risk factors such as smoking and alcohol consumption, significantly increases the risk of oral cancer. The research also highlighted the need for further studies with diverse samples to confirm these findings.

In this sense, Molony et al. (2020) analyzed tumor cell anaplasia and multinucleation as prognosticators in oropharyngeal squamous

cell carcinoma. The research demonstrated that the presence of anaplasia and multinucleation is associated with a worse prognosis, providing a solid basis for the use of these histological indicators in the assessment of disease severity. Thus, Scott-Wittenborn et al. (2023) saw the need to evaluate the feasibility of clinical evaluation in individuals at increased risk of HPV-associated oropharyngeal cancer. The study revealed that robust clinical approaches and continuous monitoring can improve early detection and management of at-risk patients, highlighting the importance of a proactive approach in clinical surveillance.

From the comprehensive analysis of the studies, it is possible to confirm the importance of HPV in the etiology of oral and oropharyngeal squamous cell carcinoma. Early detection and continuous monitoring, together with prevention strategies such as vaccination, are crucial to improve clinical outcomes. Histological markers, such as anaplasia and multinucleation, are valuable for predicting prognosis and must be considered in clinical evaluations. The combination of risk factors, including HPV, smoking and alcohol, increases the complexity of the management of oral carcinoma, requiring multidisciplinary approaches and additional research to validate the results obtained.

CONCLUSION

This review addressed the prevalence of Human Papillomavirus (HPV) and its association with oral and oropharyngeal squamous cell carcinomas, highlighting the complexity and importance of viral factors in the etiology of these types of cancer. The reviewed studies provide a comprehensive overview of how HPV infection contributes to the development of these carcinomas, with clear evidence that HPV is a significant risk factor for disease progression, especially when combined with other factors such as smoking and alcohol consumption.

The integrated analysis of these studies confirms the significant association between HPV and oral and oropharyngeal cancer, highlighting the need for prevention strategies, such as vaccination, and the importance of early diagnosis and clinical follow-up. In addition, the role of additional factors, such as smoking and alcohol consumption, must be considered for more effective management and a multidisciplinary approach in the prevention and treatment of these carcinomas. Continued research is essential to refine diagnostic and prevention strategies, aiming to reduce incidence and improve clinical outcomes for affected patients. However, to provide more scientific evidence, further controlled and high-quality studies are needed that associate HPV with the development of SCC in patients of different ethnicities.

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