

Human Herpesvirus Detection in Removable Denture Wearers' Saliva Compared to Dentate Cases

Dear Editor

The oral cavity is a complex ecosystem with numerous opportunistic microbial infections.¹ Removable dentures may serve as a reservoir for microorganisms that might cause serious diseases. The removable prosthesis may have a quantitative or qualitative impact on the oral ecology.²

Herpesviridae is a broad family of DNA viruses that causes a wide range of infections and diseases in humans. In immunocompromised individuals, the human herpesvirus 6 (HHV-6) is related to disorders and might have a role in the development of Hodgkin's lymphoma.³ Epstein-Barr virus (EBV) has the potential to cause latent lifelong infection in the host, particularly in elderly individuals. According to the findings of a study, EBV is associated with the development of various malignancies, including the genesis of oral squamous cell carcinoma (OSCC).⁴

However, little is known about the buildup of viruses in the saliva of Iranian denture wearers, which can be life-threatening for the elderly. Therefore, this study aimed to evaluate the presence of Herpes Simplex Virus type 1 (HSV-1), HSV-2, HHV-6, Cytomegalovirus (CMV), and EBV viruses in the saliva of full denture wearers.

According to a similar study,⁵ with the prevalence of HHV-8, as well as taking into account the test power of 80%, the ratio of 16% compared to 0%, and the confidence interval of 95%, 45 cases were estimated for each group. Then, the sample size was expanded to 50 to account for the probability of dropping out.

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 [P_1(1 - P_1) + P_2(1 - P_2)]}{(P_1 - P_2)^2}$$

$$Z_{1-\alpha/2} = 1.96$$

$$Z_{1-\beta} = 1.28$$

$$P_1 = 16\%$$

$$P_2 = 0\%$$

This study was conducted following the Declaration of Helsinki (1975) and was approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran (IR.SUMS.DENTAL.REC1399.143). Written informed consent was obtained from the participants. In this matched case-control study, 50 denture wearers who were referred to School of Dentistry (Shiraz, Iran) from February 2017 to mid-July 2018 were recruited. The control group included 50 participants who were matched in age and sex. The inclusion criteria were being married and brushing the teeth or dentures at least once a day. A history of HSV infection, systemic diseases, smoking, and using any antiviral or antimicrobial medications were the exclusion criteria.

The whole-mouth saliva was collected and analyzed for HSV-1, HSV-2, HHV-6, EBV, and CMV amplification. Multiplex PCR was used to detect HSV-1 and HSV-2. Conventional PCR was used to detect EBV and CMV, and real-time PCR was used to detect HHV-6. The data were analyzed using SPSS software, version 15.0 (SPSS Inc., Chicago, IL, USA). The Chi square test was used to determine the correlation between the positive and negative cases in both groups. $P < 0.05$ was considered statistically significant.

Table 1: Detection of various viruses in case and control groups

Herpesvirus	Group	Positive N (%)	Negative N (%)	P value*
HSV-1	Case	4 (8)	46 (92)	0.041
	Control	0 (0)	50 (100)	
HSV-2	Case	1 (2)	49 (98)	0.315
	Control	0 (0)	50 (100)	
HHV-6	Case	2 (4)	48 (96)	0.153
	Control	0 (0)	50 (100)	
EBV	Case	1 (2)	49 (98)	0.315
	Control	0 (0)	50 (100)	
CMV	Case	2 (4)	48 (96)	0.153
	Control	0 (0)	50 (100)	

HSV-1: Herpes Simplex Virus type 1; HSV-2: Herpes Simplex Virus type 2; HHV-6: Human Herpes Virus type 6; EBV: Epstein-Barr Virus; CMV: Cytomegalovirus; *Chi square test; P<0.05 was considered statistically significant.

In this study, 100 saliva samples, including 57 (57%) men and 43 (43%) women, were examined. The mean age of the case group was 71.6±10.2 years, and the mean age of the control group was 67.3±15.3 years. All the case and control groups were matched.

Table 1 shows the viruses that were found in the case and control groups. In the dentate subjects, no HSV-1 and HSV-2, CMV and EBV, and HHV-6 were detected. However, 4 (8%) of the case group were infected with HSV-1, and 1 (2%) of them were infected with HSV-2. Moreover, 1 (2%) of the case group had EBV infection, 2 (4%) had CMV infection, and 2 (4%) had HHV-6 infection.

There were no underlying diseases in the control group. There was no statistically significant correlation between underlying diseases such as hypertension and diabetes mellitus and HSV-1 and HSV-2 prevalence (P=0.412). Furthermore, no statistically significant correlation was found between the underlying diseases and EBV, CMV, and HHV-6 infection (P=0.406). HSV-1, HSV-2, HHV-6, EBV, and CMV were detected in the saliva of denture wearers.

The Chi square test indicated a higher and more significant HSV-1 value among denture wearers. For the other viruses, however, there was no significant difference between case and control groups. A previous study found HHV-8 in denture wearers' saliva,⁵ similar to what we detected regarding HSV-1.

Except for HSV-1, the findings of the present study indicated no significant difference between the case and control groups. Therefore, further studies with larger sample sizes are recommended. This study could pave the way for further research regarding the significance and risk of these viruses in edentulous cases.

Keywords • Dentures • Herpesvirus 1, Human • Herpesvirus 2, Human • Herpesvirus 6, Human • Herpesvirus 4, Human

Authors' Contribution

H.F: Conceptualization, methodology, investigation, resources, data curation, writing, reviewing and editing, visualization, supervision, and project administration; K.A: Methodology, investigation, resources, writing, reviewing and editing, visualization; A.M: Methodology, investigation, resources, data curation, reviewing and editing, visualization, and supervision; M.F: Conceptualization, methodology, investigation, resources, data curation, writing, reviewing, editing, visualization; H.R: Methodology, investigation, resources, data curation, visualization, and supervision; S.E and A.F: Investigation, resources, data curation, writing, reviewing and editing, and visualization. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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