論　文　全　文　要　約

Association of oral Epstein-Barr virus with oral health status in Japanese adults

（日本人成人における口腔の Epstein-Barr ウイルスと口腔の健康状態との関係）

主指導教員：竹本　俊伸教授
（医系科学研究科　口腔保健管理学）
副指導教員：内藤　真理子教授
（医系科学研究科　口腔保健疫学）
副指導教員：重石 英生講師
（医系科学研究科　公衆口腔保健学）

蘇　承翊

（医歯薬保健学研究科　口腔健康科学専攻）

Introduction

Epstein-Barr virus (EBV) is a member of the herpesviridae family. It remains unclear whether EBV is related to poor oral health among middle-aged and older Japanese people. The aim of this study was to clarify the relationship between oral EBV and oral health status in Japanese adults.

Participants and methods

We analyzed 124 patients (46 males and 78 females; mean age, 69.2 years) who visited the Department of Oral Health of Hiroshima University Hospital. We also targeted 43 dependent older people (10 men, 33 women; mean age, 87.9 years) who had a certified need for long-term support or nursing care at an adult day care center. Oral rinse samples were obtained by asking the subjects to rinse their mouths with 10 ml of saline. Orcellex® Brush (Rovers Medical Devices) was employed to collect samples from the tongue surface in dependent older people. Real time PCR analysis was performed to determine EBV DNA copy. PCR amplification of the bacterial 16S rRNA gene was performed to detect periodontopathic bacteria. Propensity scores were calculated by logistic regression analysis of 11 clinical factors (age, sex, remaining teeth, denture use, smoking, hypertension, diabetes, hyperlipidemia, stroke, heart disease, and bone and joint disease). Statistical analysis was performed using SPSS version 24.0. $P < 0.05$ was considered to indicate a statistically significant difference.

Results

EBV DNA was detected in 16 of 124 participants (12.9%). Ten of the 38 participants with periodontal pockets ≥ 6 mm were EBV DNA positive (26.3%). There was a significant association between EBV DNA positivity and probing depth ($P = 0.01$). In addition, there was a significant association between EBV DNA positivity and bleeding on probing (BOP) ($P = 0.03$). We also examined the EBV DNA copy number in 16 EBV positive cases. A significant association was not found between EBV DNA copy number and periodontal pocket depth or BOP. Next, propensity score matching was performed between participants with ≥ 4 mm periodontal pockets, BOP or both (i.e., participants with poor periodontal health) and those without ≥ 4 mm periodontal pockets and BOP (i.e., participants with good periodontal health) to investigate the relationship between EBV and periodontal health status. We identified 35 matched pairs among the participants. Participants with poor periodontal health exhibited a higher EBV DNA positivity rate (25.7%) than those with good periodontal health (0.0%). A significant association was found between EBV DNA positivity and periodontal health status ($P = 0.001$).

Total 65 samples were collected by inserting sterilized paper points into the periodontal pocket. Sterilized paper points were employed to obtain gingival crevicular fluid. Of 65 cases, 6 cases showed EBV DNA positive. Patients with ≥ 4 mm periodontal pockets with BOP recorded a higher EBV DNA positivity rate (15.8%) than those without ≥ 4 mm

periodontal pockets with BOP (6.5%). However, no significant difference was found between EBV DNA positivity and BOP or periodontal pockets with BOP. These results suggest the presence of EBV in periodontal pocket.

EBV DNA was detected in 3 of 43 dependent older people (7.0%). EBV DNA was not significantly associated with clinical factors. People with poor oral hygiene showed increased EBV DNA-positive rates (33.3%) compared with those with good or fair oral hygiene statuses (9.1% and 3.4%, respectively), but the association was not significant.

Conclusions

The results of this study suggest that EBV localizes in periodontal pockets. The oral cavity is thought to be an initial site for EBV infection. An inhibited local immune system and local periodontal inflammation may provide the chance for EBV to infect oral epithelial cells. Oral EBV infection may be associated with periodontitis in middle-aged and older Japanese people. In addition, it is thought that oral EBV infection is related to oral hygiene. Therefore, regular oral health care is necessary not only to prevent periodontitis, but also to prevent EBV infection in periodontal tissue.