Effect of Chewing Gum Containing Phosphoryl Oligosaccharides of Calcium and Fluoride Extracted from Green Tea on Early Caries Lesions of Occlusal Surface in 1st Permanent Molars of 6〜7-year-old Children

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Abstract: The purpose of this study was to evaluate the effects of chewing gum containing phosphoryl oligosaccharides of calcium (POs-Ca) and green tea extract fluoride on the activity of early caries lesions in 6〜7-year-old children. Subjects were 92 elementary school students. Chewing gum containing POs-Ca was given to 50 subjects (control group), and chewing gum containing POs-Ca and green tea extract fluoride was given to 42 subjects (F group). All subjects chewed two tablets of gum for 5 minutes once a day after lunch. Quantitative light-induced fluorescence (QLF) images of the occlusal surface of the 1st permanent molars were acquired using QLF equipment. QLF images were then examined to detect early caries lesions. The detected early caries lesions were analyzed in order to determine the volume of demineralization. The activity of early caries lesions was classified as progressing, arrested, or recovering based on changes in the results of QLF analysis over time. Chewing gum use was continued for one year, and examinations were repeated at 6-month intervals. QLF analysis of the activity of early caries showed that 32% of early caries lesions recovered in the control group, whereas 46% of lesions recovered in the F group (p<0.05). This suggests that chewing gum containing POs-Ca and green tea extract fluoride recovers early caries lesions on the occlusal surface of 1st molars in 6〜7-year-old children more effectively than chewing gum containing POs-Ca.

Key words: Early caries, Sugar-free chewing gum, Green tea extract fluoride, Calcium, Caries activity

Original

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Introduction

The prevalence of dental caries has been declining on a global scale. In Japan, a survey of dental diseases in 2011 showed that the DMFT index of 12-year-old children is 1.40, which is near the target value of healthy Japan 21 for the prevention of dental caries in 12-year-old children. Based on improvements in the oral health status, the Japanese government has devised a new action plan for health1. In this action plan, “oral health promotion” is one of the topics, demonstrating that oral health is very important for physical health maintenance and promotion. Dental caries prevention in children is the first step to promoting oral health throughout life.

Currently, dental caries are relatively rare in school-children; thus, it is difficult to evaluate oral health by observing caries experience, and so monitoring or evaluating early caries is necessary to promote caries prevention in schoolchildren. New technology has therefore been developed to detect and evaluate early caries lesions. The quantitative light-induced fluorescence (QLF) method is one of the techniques to detect early caries lesions4. Many studies have used this method to detect and monitor early caries lesions3-6, and criteria for visual examination have been changed in order to evaluate the process of dental caries8.

As previously mentioned, the decline in dental caries can be attributed to numerous factors, including the widespread use of fluoride materials, dental awareness, and the Japanese oral health system7. However, the increase in the use of fluoride dentifrices is one of the