Prophylactic effect of yogurt on Fusobacterium nucleatum in the mouth
Brigham Yang, Dr. R. Shane Gold
Brigham Young University-Hawaii

Abstract

Periodontal diseases are closely related to the activity of bacteria that are present in the mouth. Fusobacterium nucleatum can damage oral tissue and promote aggregation of potentially pathogenic organisms within the oral cavity. Yogurt is a probiotic product that can limit the growth of periodontal pathogens in vitro. The purpose of this research was to determine the prophylactic effect of yogurt in preventing the growth of F. nucleatum in the mouth. The oral microbial flora of six volunteers was sampled once per day for 14 days before lunch. The volunteers were asked to chew a small piece of paraffin (10 x 10 x 5 mm) for 3 minutes, moving it from one side of the mouth to the other and to expectorate into a sterile 15 mL centrifuge tube. No changes of diet were made for the first seven days. After a baseline had been established each participant was asked to consume 170 g of plain yogurt after breakfast every day for seven days.

Discussion

This study demonstrates that daily consumption of yogurt significantly reduces the numbers of F. nucleatum in the mouth suggesting that yogurt may have prophylactic effect against periodontal diseases. The broad standard deviation observed in this study demonstrated considerable variation in the extent of the prophylactic effect between individuals, possibly due to differences in personal oral hygiene and diet. The use of probiotic such as yogurt may have an important role to play in maintaining oral health.

Materials and Methods

Six healthy volunteers between the ages of 20 and 30 were recruited from the student population of Brigham Young University-Hawaii for this study. The oral microbial flora of each volunteer was sampled once per day for 14 days before lunch. The volunteers were asked to chew a small piece of paraffin (10 x 10 x 5 mm) for 3 minutes, moving it from one side of the mouth to the other and to expectorate into a sterile 15 mL centrifuge tube. No changes of diet were made for the first seven days. After a baseline had been established each participant was asked to consume 170 g of plain yogurt after breakfast every day for seven days.

Immediately after sampling, saliva was shaken by vortexing for 30 seconds to disperse the bacteria and then spread plated, using a 10-fold dilution series, onto Crystal-Violet Erythromycin (CVE) agar media [11] to select for Fusobacterium species. Plates were incubated for two days at 37°C; colonies were counted.

A baseline was determined for each volunteer by averaging the counts during the first week and then comparing these with the averaged results for the second week. Significance was measured using two-way ANOVA without replication.

The average numbers of F. nucleatum for the first week without daily yogurt consumption and for the second week with daily yogurt consumption were compared (Figure 1). The numbers of F. nucleatum were observed to decrease for each subject with an average overall decrease of 33.6±23.4%.

The two-way ANOVA without replication shows statistical significance of the treatment (P-value = 0.03539).

Result

The average numbers of F. nucleatum for subject 1 to 6 before and after the consumption of yogurt:

![Figure 1: The average numbers of F. nucleatum for subject 1 to 6 before and after the consumption of yogurt.](image)

References