Differences in microbiological composition of saliva and dental plaque in subjects with different drinking habits

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Several foods have been shown to contain natural components (especially polyphenols) which display anti-adhesive properties against *Streptococcus mutans*, the aetiological agent responsible for dental crown caries, as well as inhibition of glucosyltransferases, which are the *S. mutans* enzymes involved in the synthesis of an adherent, water-insoluble glucan from sucrose. Other studies have demonstrated an *in vitro* action on oral plaque biofilm formation and desorption. This study evaluated whether the activity displayed *in vitro* by food compounds could affect the microbiological composition of saliva and dental plaque of subjects with a diet rich in these foods, comparing the results with those obtained from subjects with a different diet. The foods considered were: coffee, barley coffee, tea and wine. A total of 93 subjects were recruited into the study. Six samples of both plaque and saliva were collected from each subject at roughly one-monthly intervals. Total bacteria, total streptococci, *S. mutans* and lactobacilli counts were determined by culture in both saliva and dental plaque. The highest bacterial titres were recorded for the control population, while each drinking habit subgroup showed counts roughly one log lower than the controls. These differences in bacterial counts proved statistically significant (*P*<0.05). As far as dental plaque was concerned, while total counts did not significantly vary per mg of plaque in the subjects belonging to the different drinking habit subgroups, a significant decrease (*P*<0.05) was observed in those subjects drinking coffee, tea, barley coffee and wine when mutans streptococci and lactobacilli were evaluated. In several cases a more than one log decrease was observed. Plaque indices were also determined, and a significant (*P*<0.05) reduction in values was recorded in the subjects belonging the specific drinking habit subgroups compared to the control group.
This study indicates that there is a correlation between consumption of specific foods and oral health in terms of reduced plaque deposition and lower counts of odontopathogens.

KEY WORDS: Dental plaque, Oral microflora, Caries, Coffee, Tea, Wine

INTRODUCTION

The oral microflora constitutes a complex community composed of hundreds of different microbial species. The total bacterial load and the distribution of the bacterial population of the mouth in the various ecological niches are subject to important changes in function of various parameters, including oral hygiene and intake of foods (Marsh and Martin, 1999; Marsh, 2003). The sugar components of foods have been shown to enhance bacterial growth with a resulting hyperaccumulation of potentially pathogenic bacteria to form the dental plaque (a bacterial biofilm) on the tooth surface and the gingival margin (Whittaker *et al.*, 1996; Marsh and Martin,

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