

Association between interdental plaque acidogenicity and caries risk at surface level: a cross sectional study in primary dentition

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Background. In schoolchildren the most commonly decayed primary teeth are molars affecting proximal adjacent surfaces especially.

Aim. To determine whether a more acidic plaque in response to sucrose challenge is detected in children with more carious lesions.

Design. Plaque pH measurements, using the micro-touch technique, were carried out in interproximal spaces between primary molars, in 157 high caries risk children (314 sites and caries status of the 628 proximal surfaces recorded). The area under the curve (AUC_{5,7} and AUC_{6,2}) was analyzed.

Results. The AUC_{5,7} and the AUC_{6,2} showed a statistically significant difference between plaque adjacent to proximal surfaces with or without caries. Differences for AUC_{5,7} and AUC_{6,2} were recorded between one decayed surface compared to two decayed surfaces ($P < 0.01$) whereas a statistical significant difference was only observed for AUC_{5,7}, when the areas under the curve were obtained near one decayed surface compared to two sound surfaces ($P = 0.04$).

Conclusions. The higher acidogenicity of the dental plaque found in presence of a proximal carious lesion in primary maxillary molars represents an additional risk factor for the adjacent surface. This finding may help clinicians in treatment decisions.

Introduction

In the last decades an improvement in children dental health has been described in many industrialized countries (Marthaler, 2004). In Italy, the percentage of caries-free children increased from 10% to 64%, while the percentage of untreated decayed teeth increased from 44% to 62% from 1989 to 2004 (Campus *et al.*, 2007). Dental caries is the net result of many dynamically related factors. In addition to the hard tissue, other factors include carbohydrates consumption, microbiological biofilm composition, plaque and saliva amount and composition. The result of the interaction among the different

variables involved in the caries process can be studied by assessing the metabolic activity of the oral biofilm, i.e., plaque acidogenicity¹⁻⁶. In schoolchildren the most commonly affected teeth are primary molars, at occlusal and proximal surfaces level^{7,8}. Caries risk evaluation can help the dentist to make specific preventive and treatment recommendations in order to reduce the child's risk and improve oral health. Risk assessment also contributes to efficient delivery of care, by eliminating unnecessary interventions and prolonging the prognosis of treatments⁹⁻¹¹.

The final outcome is related not only to its fermentation activity, but also to factors such as the exact composition of the tooth surface underlying the actual plaque area and the interaction between the two. Plaque factors, as well as acidogenesis and acid tolerance of plaque microorganisms, may vary^{12,13}. The time factor is important, as the development

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