CED/NOF-IADR
2024 Oral Health
Research Congress
12 — 14 Sept 2024
Geneva, Switzerland

0223

Antimicrobial Effects of Some Restorative Materials for Direct use.

U. T. Ortengren[1, 2], G. Levén[1], A. Lehrkinder[1]

[1]Cariology, Institute for Odontology/Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, [2]Material science and technology, Faculty of Odontology, Malmö University, Malmö, Sweden

Objectives Secondary caries is still a challenge worldwide. Dental materials may contribute positively or negatively to the risk of secondary caries. Increased or decreased bacterial adhesion depending on material and surface, antimicrobial and/or remineralizing effects, and change of pH close to restoration are all factors that have caught research interest. Previous studies have shown inconclusive evidence for restorative materials' ability to either induce or prevent the development of secondary caries. The aim of the present study was to investigate 1 experimental and 4 direct restorative materials regarding differences in pH-affecting properties, adherence of biofilm, fluoride leakage and surface topography.

Methods Sixty-three standardized specimens: one experimental, three contemporary composites and one resin-modified glass ionomer, respectively, were produced and incubated (48 hours, 37°C) in a multispecies bacterial suspension (*S. mutans, S. mitis, S. salivarius, S. sanguinis* and *L. acidophilus*) at pH 4.5, 5.5 and 7.0. Two control groups were used. Biofilm was collected throughout the trial and analysed with qPCR. Assays' pH and fluoride concentration were monitored. Atomic force microscopy was used to evaluate surface topography. The results were statistically evaluated (a=0.05).

Results The findings of the present study displayed that two of the tested materials had an impact on overall bacterial growth at different pH; not significant, however. Significant effects on specific strains at different pH were observed (i.e., *S. mutans*and *L. acidophilus*) for 3 of the materials tested. The smoothness of the surface was pH-dependent. *L. acidophilus*exhibited significantly lower attraction to smoother materials. No relation between fluoride release and bacterial growth could be observed. The tested experimental material did significantly affect the pH of the assays.

Conclusions The composition and surface roughness of dental materials for direct use seem to be of importance for the growth of cariogenic bacteria at different pH.