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Accumulation of *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis* on restorative materials *in vivo*.

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Aim of this *in vivo* study was to determine the adherence of the two periodontal pathogens *Actinobacillus actinomycetemcomitans (A.a.)* and *Porphyromonas gingivalis (P.g.)* to various restorative materials. 21 healthy individuals (7 male and 14 female) with a mean age of 34 years participated in this investigation. All persons showed good oral hygiene and had not received antibiotics prior or during this study. 17 gold- (I), 14 ceramic- (II), 46 fiber-reinforced (III) and 17 conventional composite resin restorations (IV) were investigated. 21 non-restored teeth served as control (V). At baseline, all teeth/restorations were carefully cleaned by supragingival scaling and polishing. Further, participants were instructed to maintain their routine oral hygiene. 3 weeks, 3, 6, and 12 months after baseline, plaque was collected from the restorations and from control teeth by means of a sterile curette, then transferred into physiologic saline solution and thereafter immediately frozen at –20°C. After isolation of the microbial DNA, bacteria were identified by polymerase chain reaction (PCR). The semiquantitative analysis was carried out by means of an automated ELISA. Results were statistically evaluated by a non-parametric test according to Brunner et al. ($p < 0.05$). Bacteria adhered significantly different to the investigated materials ($p < 0.05$). **P.g.**: IV (least) < V (control), II < III, I. **A.a**: V (least) < I, II, III, IV. From our *in vivo* data we conclude that adherence of the periodonto-pathogens P.g. and A.a. may be significantly influenced by restorative materials.

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Inhibitors of benzamidine type influence virulence properties of *Porphyromonas gingivalis*.

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In the last few years a major focus of research on *P. gingivalis* has been on the cysteine proteinases with arginine and lysine cleavage specificity. Synthetic inhibitors of benzamidine type were found to have inhibiting effects on the arginine specific cysteine proteinases. For this reason the purpose of our study was to assess the effect of these inhibitors on virulence properties of *P. gingivalis*. Two strains, the reference strain ATCC 33277 and JH16-1, a clinical isolate obtained from a patient with a severe periodontitis were included in the study. Inhibitors to be tested were pentamidine, 1 benzamidine-derivative, 3 bis-benzamidine-derivatives with pentamidine-related structure, 1 bis-benzamidine-derivative with an other structure, and 1 arginine-derivative as negative control. Concentrations of the inhibitors were 2×10^{-5} M and 2×10^{-6} M. As virulence criteria the following parameters were determined: arginine-specific proteolytic activity, hemagglutination of sheep erythrocytes, adherence to KB cells and immunophagocytosis including intracellular killing.

Results: Pentamidine and bis-benzamidine-derivatives with pentamidine related structure showed the most remarkable effects on reduction of proteolytic activity up to 20% and reduced hemagglutination from 1:64 to 1:32. Except of the arginine-derivative all other inhibitors tested enhanced capacity of phagocytosis. So the number of granulocytes with more than 20 ingested bacteria was elevated from 59 to 74% (JH16-1) or 60 to 76% (ATCC 33277) respectively by inhibitors of the bis-benzamidine group with pentamidine related structure. A clear influence of the inhibitors on adherence of *P. gingivalis* strains to KB cells was not stated. Although in vitro effects of synthetic inhibitors of cysteine proteinases on virulence of *P. gingivalis* have been found further in vitro tests concerning immunmodulatory effects should be done before a therapeutic usage of these substances in clinically controlled studies.

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