



ANTIBACTERIAL ACTIVITY OF PARTICULATE NOVAMIN AGAINST SUPRA-AND SUBGINGIVAL BACTERIA

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Particulate BioGlass® (NovaMin®) is a bioactive material used in the repair of periodontal defects. This material undergoes a series of surface reactions in an aqueous environment which lead to osseointegration. The aim of this study was to determine whether these reactions exerted an antibacterial effect on a range of oral bacteria. *Streptococcus sanguis*, *Streptococcus mutans* and *Actinomyces viscosus* were suspended in nutrient broth (NB), artificial saliva (AS) or Dulbecco's modified eagle medium plus 10% foetal calf serum (DMEM + 10%FCS), with or without particulate NovaMin®. All bacteria showed reduced viability following exposure to NovaMin® in all the media after 1 h. This antibacterial effect increased after 3 h. *Porphyromonas gingivalis*, *Fusobacterium nucleatum*, *Prevotella intermedia* and *Actinobacillus actinomycetemcomitans* were suspended in either BM broth or 40% horse serum (HS) in RPMI. A considerable reduction in viability was observed with all bacteria tested, in both media, compared to inert glass controls. In further experiments it was found that the viability of *S. sanguis* was significantly reduced following exposure to NB pre-incubated with NovaMin®. Additionally, it was found that neutralisation of this highly alkaline solution eliminated the antibacterial effect. Moreover, a solution of NB and NaOH (of equivalent pH) exerted an antibacterial effect of similar magnitude to that of the solution pre-incubated with NovaMin®. Thus, particulate NovaMin® exerts an antibacterial effect on certain oral bacteria, possibly by virtue of the alkaline nature of its surface reactions. This may reduce bacterial colonisation of its surface in vivo.

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