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In vitro proliferation of human osteogenic cells in presence of different commercial bone substitute materials combined with enamel matrix derivatives

Background: Cellular reactions to alloplastic bone substitute materials (BSM) are a subject of interest in basic research. In regenerative dentistry, these bone grafting materials are routinely combined with enamel matrix derivatives (EMD) in order to additionally enhance tissue regeneration.

Materials and methods: The aim of this study was to evaluate the proliferative activity of human osteogenic cells after incubation over a period of seven days with commercial BSM of various origin and chemical composition. Special focus was placed on the potential additional benefit of EMD on cellular proliferation.

Results: Except for PerioGlas®, osteogenic cell proliferation was significantly promoted by the investigated BSM. The application of EMD alone also resulted in significantly increased cellular proliferation. However, a combination of BSM and EMD resulted in only a moderate additional enhancement of osteogenic cell proliferation.

Conclusion: The application of most BSM, as well as the exclusive application of EMD demonstrated a positive impact on the proliferation of human osteogenic cells in vitro. In order to increase the benefit from substrate combination (BSM + EMD), further studies on the interactions between BSM and EMD are needed.