

Abstract:

Aim and background: Bone substitutes are used widely in implant dentistry and periodontal bone defects. Allografts are one of the most popular bone substitutes used in dentistry. Demineralized Freeze-Dried Bone Allografts (DFDBAs) and Freeze-Dried bone Allografts (FDBAs) are two main types of allografts. There are conflicting results about the efficacy of these two main types of allografts, so we decided to compare the biocompatibility and osteopromotive ability of these materials in an in-vitro environment.

Methods and materials: In order to compare biocompatibility and osteopromotive ability between DFDBA (Kish, Iran) and FDBA (Kish, Iran), they were kept in adjacent to MG-63 cell line. MTT test was applied after 24 and 72 hours to asses biocompatibility. The Alizarin red test was performed after 14 days to asses osteopromotion. The MTT was analyzed by paired-t test and the Alizarin red by independent t-test.

Results: The MTT test showed that the FDBA had higher proliferation rate percentage than the DFDBA in both 24 and 72 hours significantly. ($p \leq 0.05$) According to Alizarin red, the density of calcified nodules was higher in DFDBA than FDBA significantly. ($P \leq 0.05$)

Discussion: DFDBA is produced by demineralization of FDBA. In this process, acidic materials are added to FDBA as demineralization agents. According to the results of this study, it is possible that the acidic nature of DFDBA might reduce the proliferation rate of bone-like cells. On the other hand, the acidic nature of DFDBA could release growth factors like BMPs. This might explain the reason for more calcified nodules in DFDBA than FDBA. Further studies are needed to compare FDBA and DFDBA in animal and clinical trial studies.

Key words: FDBA, DFDBA, MG-63, osteopromotion, biocompatibility.