OsteoBiol® by Tecnoss

OsteoBiol® influences osteogenic differentiation of adipose derived stem cells

LABORATORY TESTS

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ABSTRACT

In order to achieve a successful implant rehabilitation, often it is necessary to perform a bone regeneration treatment, involving the substitution of damaged tissues by using biomaterials able to act as scaffolds for bone growth, without any foreign body reaction. To increase the bone volume, it is possible to use autologous bone grafts; anyway, these present some disadvantages, due to their limited availability, their tendency to partially resorption, the need for an additional surgery, and the increased morbidity. This is why xenografts - derived from porcine or bovine origin - are considered valid alternatives to autografts. Actually, they represent an unlimited supply of available material, reduce disease transmission or infection and have good osteoconductive properties.

In this study, the Authors tested the osteogenic potential of OsteoBiol® (Tecnoss®, Giaveno, Italy), a cortical collagenated porcine bone, that shows good biocompatibility and osteoconductive properties. To study how cortical porcine bone can induce osteoblast differentiation and proliferation in mesenchymal stem cells, the expression levels of bone related genes (RUNX2, SP7, ALPL, SPP1, COL1A1, COL3A1 and FOSL1) and mesenchymal stem cells marker (ENG) were measured in Adipose Derived stem cells (ADSCs) and Human Osteoblasts (HOb) cultivated with OsteoBiol®. For the test purposes, OsteoBiol® at the concentration of 10 mg/ml was added at ADSCs and HOb cultures. The treatment was performed at two time point: 15 days and 30 days.

CONCLUSIONS

The results of this study demonstrate that OsteoBiol® induces matrix synthesis and deposition in osteoblasts in the late stages differentiation; it has a potential role in stem cells osteodifferentiation and osteoinductive properties. Moreover, the up-regulation of SPP1 showed that this biomaterial is actively resorbed by human osteoclasts.

ORIGINAL ARTICLE
European Journal of Inflammation
2011;9(3 Suppl):103-7

Material tested

BONE SUBSTITUTE
OsteoBiol® *Apatos*

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