BONE REGENERATION PROMOTED BY THE ASSOCIATION OF POLY (LACTIC-CO-GLYCOLIC ACID) SCAFFOLDS SEEDED WITH STEM CELLS FROM THE PULP OF HUMAN DECIDUOUS TEETH

Gerson Arisoly Xavier Acasigua, Lisiane Bernardi, Daikelly Iglesias Braghirolli, Manoel Sant'Ana Filho, Patricia Helena Lucas Pranke, Anna Christina Medeiros Fossati

Bioengineering combines knowledge from different areas seeking new ways of producing tissue. This study aimed to evaluate the use of nanotechnology with stem cells for bone formation in rats. Scaffolds from poly (lactic-co-glycolic acid) (PLGA) were produced by electrospinning technique, and proved to be suitable for use in tissue engineering. Stem cells from five samples of human deciduous teeth (SCDT) were grown until the 5th passage. They were seeded onto culture plates (control) and scaffolds for adhesion and cell viability assays. To evaluate their ability to promote bone formation, 15 Wistar rats were used, in which critical defects were produced with a 8.0 mm diameter in the skull. The animals were divided into three groups (n=5): I– only scaffolds; II– scaffolds/SCDT; III– scaffolds/SCDT, maintained for 13 days in osteogenic medium. Sixty days postoperatively, the caps were removed for histometric analysis of the amount of newly formed bone. It was observed that cellular adhesion and viability in all groups was similar throughout the experiment, without statistical difference. The association of scaffolds with SCDT maintained in osteogenic medium, showed statistically greater bone formation than the other groups ($9.39 \pm 2.55\%$, $10.7 \pm 3.22\%$ and $17 \pm 4.31\%$ in groups I, II and III respectively). In group III, it was possible to observe bone formation as islands within the area of the bone defect and newly formed bone was juxtaposed onto the scaffold/osteoblast. It is concluded that the PLGA scaffolds produce favorable results in relation to the interaction with the SCDT. The use of PLGA and cells in association with osteogenic medium results in promoting bone formation.