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The effective impact of BiodentineTM on the odonto/osteogenesis pathway of human dental pulp stem cells.

Duaa Abuarqoub

The clinical use of bioactive material in the field of biomedical tissue engineering has increased recently. The objective of this study was to investigate if the in vitro culture of human dental pulp stem cells (hDPSCs) in media containing BiodentineTM (BD) influences their odonto/osteogenic differentiation potential. HDPSCs were extracted and characterized for their MSC expression profile by flow cytometry. Then, the obtained cells were cultured in media containing BD for 3 weeks to study the impact of BD on their odonto/osteogenesis pathway compared to the positive control (Osteogenic media) and negative control (cell culture media). Odonto/osteogeneic differentiation of hDPSCs treated with BD was evaluated by measuring the level of expression of odontoo/steogenesis PCR array. Our results have indicated that hDPSCs treated with BD showed a significant increase in the expression of odonto/osteogenesis pathway by using Odonto/osteogenesis PCR array. Our results have indicated that hDPSCs treated with BD showed a significant increase in the expression of odonto/osteogenesis pathway were upregulated compared to the control groups, specifically the genes that are involved in BMP signaling pathway, the activation of the extracellular matrix-related gene (ECMG) and Ca2 + signalling pathway. We conclude that BD showed a stimulatory effect on the odonto/ osteogenic capacity of hDPSCs, making BD a good candidate to be used clinically in dentire regeneration.

Biography

Dua'a Abuarqoub is an assistant professor in University of Petra-Jordan. She finished her PhD in "Stem Cell Biology", from the University of Jordan. She also holds an MSc in "Applied Biosciences-Stem cell biology" and a BSCs in "Biotechnology and genetic engineering" from Jordan university of science and technology. She worked as a researcher in Cell Therapy Center -The university of Jordan. She was the head of dental stem cell research project, working on different types of dental stem cells, exploring their features and their differentiation potential toward different lineages. She was the head of flow cytometry core lab. She has over 25 publications about stem cells, and nanobiotechnology.