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The Advances in the Use of Stem Cells in Dentistry

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ABSTRACT

Stem cells can be used in several areas including dentistry for the formation and regeneration of tissues in the oral cavity. Dental pulp stem cells are able to differentiate into several types, such as fibroblasts, cementoblasts, osteoblasts and odontoblasts. They have great potential for repairing and renewing bone tissues, dentin and dental fixation elements. The reason to use them is becasue they have the ability to differentiate into several cell types according to the stimulus received. Although they have not routinely applied in the clinic, the use may represent a major advance for dentistry, which may help the structural restoration of dental tissues. This study aims to review the literature on the use of stem cells and clarify the potential use of these cells in dentistry. A review of the literature was performed in the virtual libraries VHL and SCIELO with the keywords of "Cells Tronco"; "Dentistry"; "Bioengineering". Following inclusion criteria, articles published from 2012 were established in the Portuguese and Spanish languages that relate the use of stem cells to dentistry. The search resulted in 55 related articles,but six articles met the inclusion criteria. It has been found that stomatognathic system is one of the richest sources of adult stem cells . There are many possibilities in using stem cell techniques in Dentistry, from the use of stem cells in dental losses due to periodontal diseases or cavities to prevent bone resorption. In studies, the mesenchymal stem cells mediated osteogenesis from two to 14 weeks post graft, reflecting the positive result of this application.The use of stem cells in regeneration of pulp in treatment of emptied channels induced the space of root canal to be refilled with pulp tissue. However, it has not yet been possible to guarantee adequate blood supply after pulp removal. The use of stem cells in the elaboration of nonmetallic implants led to a biological dental root, promoting the dental morphogenesis, althugh the morphogenesis of tissue is dependent on growth factors and tissue interactions have not fully understood. The stem cells represent a promising future for dentistry. Its use can help to solve rejections to non-organic materials, such as metal implants, and prevent dental and bone loss. It is possible that, in the near future, bioengineering will be used in endodontic and periodontal therapy, although much is still unknown, which highlights the importance and need for more research and studies in this area.

Keywords:

Bioengineering; Stem cells; Dentistry

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