Policy on Stem Cells

Review Council
Council on Clinical Affairs

Revised
2013

Stem cells are pluripotential cells that can divide and multiply for an extended period of time, differentiating into a diverse range of specialized cell types and tissues. Adult mesenchymal stem cells, of which dental stem cells are a subset, are highly proliferative and have the ability to differentiate into many cell lines.[1] The most familiar application of adult stem cell therapy is bone marrow transplantation to treat hematopoietic cancers, metabolic disorders, and congenital immunodeficiency syndromes. Stem cell therapy is undergoing clinical testing for other conditions such as Parkinson's disease, diabetes, and brain trauma/spinal cord injuries.[2,3] Suggested applications related to oral health care have included wound healing and regeneration of dental and periodontal tissues as well as craniofacial structures (e.g., repair of cleft lip/palate).[4]

Parents may elect to preserve umbilical cord blood of their child for future harvesting of stem cells if autologous regenerative therapies are indicated. Pulpal tissue of exfoliating primary teeth and surgically removed third molars may serve as a source of mesenchymal stem cells.[5] While sources of dental stem cells are readily accessible, those cells must be secured and stored properly to maintain the potential to proliferate and differentiate.[6] The public is increasingly aware of this emerging science, and more parents are expressing interest in harvesting/banking dental stem cells.

The American Academy of Pediatric Dentistry (AAPD) recognizes the emerging field of regenerative medicine and encourages dentists to follow future evidence-based literature in order to educate parents about the collection, storage, viability, and use of dental stem cells with respect to autologous regenerative therapies. As the technology continues to evolve, the process of procurement of dental stems cells should be accomplished only with deliberate integrity and appropriate informed consent to assure the highest ethical standards and quality of outcomes.

This policy was originally developed by the Council on Clinical Affairs and adopted in 2010.

References

1. Govindasamy V, Ronald VS, Abdullah AN, et al. Differentiation of dental pulp stem cells into islet-like aggregates. J Dent Res 2011;90(5):626-52.
2. Kadar K, Kiraly M, Porcsalmy B, et al. Differentiation potential of stem cells from human dental origin – Promise for tissue engineering. J Physiol Pharmacol 2009;60 (suppl 7):167-75.
3. Nourbakhsh N, Soleimani M, Taghipour Z, et al. Induced in vitro differentiation of neural-like cells from human exfoliated deciduous teeth-derived stem cells. Int J Dev Biol 2011;55(2):189-95.
4. Nishino Y, Yamada Y, Ebisawa K, et al. Stem cells from human exfoliated deciduous teeth (SHED) enhance wound healing and the possibility of novel cell therapy. Cytotherapy 2011;13(5):598-605.
5. Eslaminejad MB, Vahabi S, Shariati M, Nazarian H. In vitro growth and characterization of stem cells from human dental pulp of deciduous versus permanent teeth. J Dent (Tehran) 2010;7(4):185-95.
6. Perry BC, Zhou D, Wu X, et al. Collection, cryopreservation, and characterization of human dental pulp-derived mesenchymal stem cells for banking and clinical use. Tissue Eng Part C Methods 2008;14(2):149-56.