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Policy on Using Harvested Dental Stem Cells

Originating Council

Council on Clinical Affairs

Review Council

Council on Clinical Affairs

Adopted

2008

Revised

2013, 2017

Purpose

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. The AAPD recognizes that harvested dental stem cells is an emerging science which may have application for oral health care but at present there are no treatments available using harvested dental stem cells in humans. This policy is related to the use of harvested dental stem cells from a tooth or follicle. This policy does not include stem cells which are intrinsically present for treatment related to regenerative endodontics from the apical papilla or dental pulp cells. Stem cells used for regenerative endodontics and scaffolding have evidenced based literature to show successful regeneration.[1-3]

Methods

This policy is a review of current dental and medical literature and sources of recognized professional expertise related to dental stem cells. An electronic search was conducted using the PubMed® electronic database with the following parameters: Terms: “dental stem cell”, and “harvested tooth cell”; Fields: all; Limits: within the last 10 years, humans, English, birth through age 99. Thirty one articles matched these criteria. Papers for review were chosen from this list and from the references within selected articles. Expert and/or consensus opinion by experienced researchers and clinicians was also considered.

Background

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.[4]. 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[5,6]. Suggested applications related to oral health care have included wound healing and regeneration of dental and periodontal tissues as well as craniofacial structures (eg, repair of cleft lip/palate)[7].

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, oral mucosa fibroblasts[8] ~~and~~ surgically removed third molars, periodontal ligament[9] and gingival fibroblasts[9] may serve as a source of mesenchymal stem cells.[2,10].

The public is increasingly aware of this emerging science, and more parents are expressing interest in harvesting/banking dental stem cells. 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 [11,12]. Additionally, currently harvested dental stem cells are not very stable and have been known to form tumors *in vivo*.[2] More studies are recommended to assess the safety and efficacy of harvested dental stem cells prior to initiating human clinical trials[2.] ~~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 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.~~

Policy Statement

- The AAPD recognizes that harvested dental stem cells is an emerging science which may have application for oral health care.

- The AAPD does not endorse the storage or use of harvest dental stem cells as there are no treatments available using harvested dental stem cells in humans.
- 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.

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