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The use of adipose tissue and bone marrow derived stem cells in regeneration of cleft alveolus in dogs

Reem Allarakia

King Abdulaziz University, Saudi Arabia

Objectives: This study was designed to evaluate the therapeutic potential of adipose tissue derived mesenchymal stem cells compared to bone marrow derived mesenchymal stem cells on regeneration of surgically created alveolus in dogs.

Materials & Methods: Split mouth experimental study was performed on 12 healthy and vaccinated mongrel dogs. These dogs were treated in accordance with the ethics of animal use in research committee (EAURC) authorized by the Faculty of Veterinary Medicine, Cairo University. The dogs were divided into two groups: In group A, the experimental side (right side of maxilla), the surgically created alveolus, were transplanted with adipose tissue derived mesenchymal stem cells (AT-MSCs) and scaffold as well as growth factors. In group B, the experimental side (right side of maxilla) the surgically created alveolus, were transplanted with bone marrow derived mesenchymal stem cells (BM-MSCs) and scaffold as well as growth factors. The control side (left side of maxilla) the surgically created alveolus, were transplanted with scaffold and growth factors only. The flaps were replaced and sutured with resorbable sutures. Bone regeneration was evaluated by histomorphometrically analysis after one month and half, after dogs' scarification. The data wren evaluated with descriptive and t test methods ($p=0.05$).

Results: Stem cells whether AT-MSCs or BM-MSCs accelerate the healing and regeneration of the defected area by increasing the bone width and surface area; providing bone quantity and quality as early as 1.5 months.

Conclusion: AT-MSCs and BM-MSCs are an attractive tool in bone regeneration. AT-MSCs in experimental studies showed that their effectiveness is comparable to BM-MSCs, in addition to its low cost, ease of harvesting and safer procedure to obtain stem cells as well as less risk of infection.

Biography

Reem Allarakia graduated from King Abdulaziz University, Faculty of Dental and Oral Surgery, Jeddah 2005. Following a master in pediatric dentistry in King Abdulaziz University, I completed my PhD (2017) at the same university to study the effect of adipose tissue and bone marrow mesenchymal stem cells on bone regeneration and lip healing on dogs with surgically created cleft lip and alveolus. Now am working in King Fahad Armed Force Hospital as a pedodontist, who loves to create happy and healthy smiles on each child.

dr.reemallarakia@gmail.com

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