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Evaluating the Potential Benefits of Bone Marrow Mesenchymal Stem Cells Transplantation in the Submandibular Salivary Glands of Diabetic Albino Rats

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Background : Diabetes mellitus is a group of metabolic disorders resulting from deficient insulin secretion and action. Conventional therapies fail to maintain normal blood glucose level all the time.

Objectives : Exploring the potential benefits of bone marrow mesenchymal stem cells (BMSCs) in ameliorating diabetes-induced alterations in the rat submandibular salivary glands.

Methods : 30 adult male albino rats were used. Type1 diabetes was induced via a single intraperitoneal injection of streptozotocin. The rats were then randomly grouped into (GI, GII and GIII) (10 rats each) Group I: rats were left untreated. Group II: rats received a single IV injection of BMSCs on the 3rd day after diabetes induction, Group III: rats received a single IV injection of BMSCs 1 month following diabetes induction. All rats were sacrificed 1 month following BMSCs injection. The submandibular salivary glands were dissected and evaluated histologically, immunohistochemically, histomorphometrically and by real time-polymerase chain reaction (RTPCR).

Results : RT-PCR revealed maximum Bcl2 gene expression in group III. Histologically, group I showed degenerative changes as shrinkage of the acini and ducts, intracellular vacuolizations, and inflammatory infiltration. In group II, cellular vacuolizations were seen in some parenchymal cells. Group III showed the acini and ducts being almost normal. Immunohistochemical examination revealed an increased expression of iNOS in group I, while the least expression occurred in group III.

Conclusions : These results indicated that transplanting BMSCs could ameliorate diabetes induced alterations in salivary glands; this effect was more obvious in the treatment rather than the prophylactic group.

Biography

Iman Mahmoud Abou-Shady has completed her PhD in dental science (Oral Biology) at the age of 33 years from cairo University. She is a lecturer at the Faculty of Oral and Dental Medicine, Cairo University. She has published four papers in reputed journals and has been serving as a lecturer till now. Zeinab Amin Salem has completed her PhD in dental science (Oral Biology) at the age of 33 years from Cairo University. She is a lecturer at the Faculty of Oral and Dental Medicine, Cairo University. She has published five papers in reputed journals and has been serving as a lecturer till now. Tahany Abdelkareem Haggag has completed her PhD in dental science (Oral Biology) at the age of 37 years from Cairo University. She is a lecturer at the Faculty of Oral and Dental Medicine, Cairo University. She has published four papers in reputed journals and has been serving as a lecturer till now.

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