World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:9, No:08, 2015

Histological Study on the Effect of Bone Marrow Transplantation Combined with Curcumin on Pancreatic Regeneration in Streptozotocin Induced Diabetic Rats

Authors : Manal M. Shehata, Kawther M. Abdel-Hamid, Nashwa A. Mohamed, Marwa H. Bakr, Maged S. Mahmoud, Hala M. Elbadre

Abstract : Introduction: The worldwide rapid increase in diabetes poses a significant challenge to current therapeutic approaches. Therapeutic utility of bone marrow transplantation in diabetes is an attractive approach. However, the oxidative stress generated by hyperglycemia may hinder β-cell regeneration. Curcumin, is a dietary spice with antioxidant activity. Aim of work: The present study was undertaken to investigate the therapeutic potential of curcumin, bone marrow transplantation, and their combined effects in the reversal of experimental diabetes. Material and Methods: Fifty adult male healthy albino rats were included in the present study.They were divided into two groups: Group I: (control group) included 10 rats. Group Π: (diabetic group): included 40 rats. Diabetes was induced by single intraperitoneal injection of streptozotocin (STZ). Group II will be further subdivided into four groups (10 rats for each): Group II-a (diabetic control). Group II-b: rats were received single intraperitoneal injection of bone marrow suspension (un-fractionated bone marrow cells) prepared from rats of the same family. Group II-c: rats were treated with curcumin orally by gastric intubation for 6 weeks. Group II-d: rats were received a combination of single bone marrow transplantation and curcumin for 6 weeks. After 6 weeks, blood glucose, insulin levels were measured and the pancreas from all rats were processed for Histological, Immunohistochemical and morphometric examination. Results: Diabetic group, showed progressive histological changes in the pancreatic islets. Treatment with either curcumin or bone marrow transplantation improved the structure of the islets and reversed streptozotocin-induced hyperglycemia and hypoinsulinemia. Combination of curcumin and bone marrow transplantation elicited more profound alleviation of streptozotocin-induced changes including islet regeneration and insulin secretion. Conclusion: The use of natural antioxidants combined with bone marrow transplantation to induce pancreatic regeneration is a promising strategy in the management of diabetes.

Keywords : diabtes, panceatic islets, bone marrow transplantation, curcumin
Conference Title : ICMMA 2015 : International Conference on Microscopic and Macroscopic Anatomy
Conference Location : Barcelona, Spain
Conference Dates : August 17-18, 2015

Open Science Index, Bioengineering and Life Sciences Vol:9, No:08, 2015 publications.waset.org/abstracts/29294/pdf