

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

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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 II: (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 : diabetes, pancreatic islets, bone marrow transplantation, curcumin

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