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A Comprehensive Study of Chronic Diabetes Complications in Streptozotocin-Induced Diabetic Rat

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Abstract

Objective: The purpose of this study was to provide a reference of chronic diabetes complications by investigating the prolonged hyperglycemia effects on hematological, biochemical and histopathological changes (liver, kidney, spleen, cardiac muscle, adrenal gland, and endocrine pancreas) in diabetic rats induced by streptozotocin. Methods: Ten adult female Sprague-Dawley of uniform age were divided into two Groups. Group 1 was made diabetic by single intraperitoneal injection of streptozotocin (60 mg/kg/bw) whereas Group 2 served as control. After six months, the rats were anesthetized using pentobarbital. Cardiac puncture was performed to get 3 ml of the blood sample; following 12 hours of an overnight fast. Serum chemistry test and complete blood analysis for lipid profile and blood glucose test; liver and renal functions were performed. Tissue specimens of liver, kidney, spleen, cardiac muscle, adrenal gland, and endocrine pancreas were fixed in 10% formal saline and processed for histological study. Results: There were severe histopathological changes in the affected organs; and the presence of a significant abnormality of lipid profile, liver, and renal functions. Conclusions: The presence of histopathological changes with abnormal biochemical changes is related to the chronic absence of insulin production in the destroyed beta-cells which reflect the diabetic complications in a human being.

Keywords

Author Keywords: biochemical; histopathological; rats; streptozotocin

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