MEDICAL CHANNEL

Original Article

PROTECTIVE ROLE OF VITAMIN C ON PROXIMAL CONVOLUTED TUBULES OF ALBINO RATS IN STREPTOZOTOCIN INDUCED DIABETES.

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ABSTRACT:

Background: This study has been undertaken to study the renoprotective effect of Vitamin C on the histology of the proximal convoluted tubules in streptozotocin (STZ) induced diabetes in albino rats. The effect of Vit C on the serum glucose and glycated hemoglobin has also been studied in these rodents.
Study Design: A prospective experimental study.
Place: Department of Anatomy, Basic Medical Sciences Institute, Jinnah Postgraduate Medical Centre, Karachi.
Duration: February to March, 2010 for a period of 8 weeks.
Material and Methods: Thirty male albino rats were divided into three groups A, B and C respectively. Group A served as the control group, group B and C were administered STZ in a single dose of 45 mg/kg whereas group C additionally received Vit C in a dose of 10g/L/day in drinking water three days before the administration of STZ. The rats were sacrificed at the end of the experimental period, their blood samples taken and their kidneys dissected, fixed in alcoholic formalin and processed further for histological examination. Serum glucose and glycated Hemoglobin (HbA1C) levels were compared in all the three groups.
Results: The microscopic examination of the proximal convoluted tubules revealed marked epithelial, cytoplasmic and nuclear changes in the STZ treated group B and significant reduction in the severity of these changes in Vit C treated group C. There was a considerable increase in serum glucose and glycated Hb levels in both STZ and Vit C treated groups as compared to control.
Conclusion: The results of the investigation indicated that Vit C administration suppressed the progression of renal injury in diabetic rats. So dietary supplementation with Vit C could be an easy, inexpensive and useful method of protecting diabetic patients from Oxidative damage.

Key Words: Streptozotocin, Vit C, Reactive Oxygen Species, Antioxidant.

INTRODUCTION:

Diabetes Mellitus forms an enormous and still increasing health burden world wide. Mortality and morbidity are caused by the occurence of complications. One of the microvascular complications is diabetic nephropathy in both type 1 and type 2 diabetes mellitus, which is the leading cause of adult renal failure at the moment[1].
Accumulating research suggests that oxidative stress is a significant contributor to the pathogenesis of diabetic nephropathy. The normal kidney generates a substantial amount of oxidative stress because of its high metabolic activity that is balanced by an extensive antioxidant system. However, in pathologic states such as hyperglycemia, oxidant balance shifts towards a pro-oxidant state that accelerates tissue and vascular injury. This oxidative damage progresses concomitant with worsening glucose metabolism, vascular dysfunction and kidney disease[2].