J Obes Weight Loss Ther 2019, Volume 9
DOI: 10.4172/2165-7904-C1-091

The biological effects of vitamin D with calcium on oxidative stress in diabetes

Fatema S Alatawi
University of Tabuk, Saudi Arabia

Statement of the Problem: Diabetes mellitus is a major health issue in many countries around the world. In diabetes mellitus, uncontrolled hyperglycemia has been reported to induce oxidative stress and stimulates free radical formation, which may lead to many health complications. Vitamin D, however acts as a non-enzymatic antioxidant to protect cells against oxidative stress and cellular damage. The purpose of this study is to investigate the antioxidative effect of vitamin D plus calcium in streptozotocin (STZ)-induced diabetic rats.

Methodology: Rats were divided into four groups. First group (n=10) served as control and received a normal diet and water. Second group (n=6) served as a diabetic control (untreated). Third group (n=10) including diabetic rats orally received vitamin D (2000 IU/day) with calcium (500 mg/kg/day). Fourth group (n=9) including diabetic rats was treated with insulin. Blood glucose was measured weekly during this study. Activities of superoxide dismutase (SOD), glutathione peroxidase (GPO) and catalase were measured in the liver tissues. The level of malonaldehyde (MDA) was measured in the plasma.

Findings: The blood glucose levels were significantly lower in STZ-induced diabetic rats treated with vitamin D plus calcium than in untreated diabetic rats. Diabetic rats showed a significant decrease in the activities of SOD, GPO and catalase compared to normal rats. Oral administration of vitamin D with calcium to diabetic rats caused a significant increase in the activities of SOD, GPO and catalase compared with the untreated group. Furthermore, the plasma level of MDA was significantly elevated in diabetic rats compared to normal rats. Diabetic rats treated with vitamin D and calcium had a significantly reduced level of MDA, suggesting that vitamin D with calcium played a vital role in the protection of tissues from damage by free radicals.

Conclusion: Pathogenesis complication of diabetes mellitus that resulted from oxidative stress could be prevent or limited by oral supplementation of vitamin D combined with calcium.