World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Vitamin C Supplementation Modulates Zinc Levels and Antioxidant Values in Blood and Tissues of Diabetic Rats Fed Zinc-Deficient Diet

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Abstract : The aim of this study was to investigate the effect of vitamin C on blood biochemical parameters, tissue zinc, and antioxidants enzymes in diabetic rats fed a zinc-deficient diet. For that purpose, Alloxan-induced diabetic rats were divided into four groups. The first group was fed a zinc-sufficient diet while the second group was fed a zinc-deficient diet. The third and fourth groups received zinc-sufficient or zinc-deficient diets plus oral vitamin C (1mg/l) for 27 days. Body weight and food intake were recorded regularly during 27 days. On day 28, animals were killed and glucose, total lipids, triglycerides, protein, urea, serum zinc , tissues zinc concentrations, liver glycogen, GSH, TBARS concentrations and serum GOT, GPT, ALP and LDH, liver GSH-Px, GST and Catalase activities were determined. Body weight gain and food intake of zinc deficient diabetic animals at the end of experimental period was significantly lower than that of zinc adequate diabetic animals. Dietary zinc intake significantly increased glucose, lipids, triglycerides, urea, and liver TBARS levels of zinc deficient diabetic rats. In contrast, serum zinc, tissues zinc, protein, liver glycogen and GSH levels were decreased. The consumption of zinc deficient diet led also to an increase in serum GOT, GPT and liver GST accompanied with a decrease in serum ALP, LDH and liver GSH-Px, CAT activities. Meanwhile, vitamin C treatment was ameliorated all the previous parameters approximately to their normal levels. Vitamin C supplementation presumably acting as an antioxidant, and it probably led to an improvement of insulin activity, which significantly reduced the severity of zinc deficiency in diabetes.

Keywords : antioxidant, experimental diabetes, liver enzymes, vitamin c, zinc deficiency
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020