Abstract

The Effect of Gingko Biloba Extract and Zinc Supplementation on Iron Status in Diabetic Rats [†]

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Abstract: Diabetes is a metabolic disease characterized by changes in carbohydrate and lipid metabolism. In turn, prolonged hyperglycemia may lead to increased oxidative stress and changes in the status of elements, including iron. Both ginkgo biloba extract (GBE) and zinc (Zn) may play a role in glycemic control. In this study, the effect of these ingredients both individually and in combination on the parameters of iron metabolism in diabetic rats was assessed. The experiment was carried out on male Wistar rats. The control group fed a standard diet (AIN-93M) was created, and in the rest of the rats diabetes was induced by feeding a high-fat diet and streptozotocin injection. Then, diabetic rats were divided into four groups: diabetic control, diabetic supplemented with Zn, diabetic supplemented with GBE, and diabetic supplemented with Zn and GBE. The doses of these supplements were 150 mg/kg diet for Zn and 0.8% for GBE, respectively. Rats were fed the diets for 6 weeks. During the autopsy, internal organs (liver, kidneys, spleen, pancreas, testis and heart) were collected. The content of Fe in tissues was determined by the AAS method followed by microwave digestion. Moreover, the serum ferritin concentration was measured. The significance of differences between the groups was analyzed by one-way analysis of variance and Tuckey's post-hoc test. The induction of diabetes resulted in a significant increase in Fe content in the pancreas and liver, as well as serum ferritin levels. Zn supplementation had no effect on the parameters studied. However, it was found that GBE alone and in combination with Zn significantly normalized the parameters studied in diabetic rats. In conclusion, GBE supplementation significantly improved the parameters of Fe metabolism, probably due to the fact that the extract contains compounds showing the ability to chelate iron ions.

Keywords: gingko biloba; zinc; diabetes; iron

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