

Ameliorating effects of Chlorella protein on glucose tolerance test and serum insulin and adipocytokines levels in STZ diabetic rats

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Objectives: Adipocytokines are known to play important roles in insulin resistance, in which adiponectin, resistin, and TNF- α are most frequently addressed adipocytokines. Chlorella, one type of unicellular fresh water alga, has been shown to produce hypoglycemic effects in diabetic animals. The aims of this study were to investigate the effectiveness of Chlorella protein on ameliorating insulin resistance in streptozocin (STZ)-induced diabetic animals. **Methods:** Type II Diabetic rats were induced by the i.p. injection of nicotinamide and STZ. Vehicle and glipzide-treated STZ rats were used as control and positive control, respectively. The effects of Chlorella protein and glipzide on glucose tolerance test (GTT), serum insulin, adiponectin, resistin, and TNF- α levels were measured 14 days after the treatments. **Results:** Results of GTT showed that blood glucose levels were significantly lower in Chlorella protein (250 mg/kg) and glipzide-treated STZ rats than the controls. Serum insulin ($241.5.7\pm 11.97$, $p<0.01$), resistin (2.0 ± 0.26 , $p<0.005$), TNF- α (21.13 ± 0.82 , $p<0.05$) levels were much higher in the untreated STZ rats than normal (non-STZ) rats (181.7 ± 3.76 , 1.4 ± 0.27 , 12.8 ± 1.29 , respectively). Whereas, adiponectin level in STZ rats (2.71 ± 0.11 , $p<0.005$) was lower than the normal rats (4.12 ± 0.1). After 14 days treatment, Chlorella protein (500 mg/kg) treated group alleviated serum insulin (179.0 ± 7.91 , $p<0.01$), adiponectin (4.136 ± 0.42 , $p<0.05$), resistin (1.22 ± 0.02 , $p<0.01$), and TNF- α (9.42 ± 1.7 , $p<0.005$) levels compared to the controls. **Conclusion:** Chlorella protein improves insulin sensitivity by ameliorating adiponectin, resistin and TNF- α levels in STZ-induced type II diabetes, which may account for its hypoglycemic effects.