

Evaluation the effects of insulin on oxidant/ antioxidant status in type 1 diabetic patients

Abstract

Earlier works have revealed increased generation of reactive oxygen species (ROS) and decreased antioxidant levels in type 1 diabetes mellitus (T1DM). The current study aimed to investigate the effect of mixed insulin therapy on oxidative stress and antioxidant status in patients with T1DM. This study involved 75 participants who were divided into three groups: 20 healthy subjects as a control, 25 newly diagnosed patients with T1DM (without treatment) and 30 patients with T1DM treated with insulin (regular and Human Neutral Protamine Hagedorn (NPH)) twice daily. Fasting serum glucose (FSG), serum concentrations of insulin, malondialdehyde (MDA), catalase (CAT), reduced glutathione (GSH), and vitamins (C and E) were measured in all participants. Compared with the healthy control, serum glucose and MDA concentrations were observed to be significantly higher, while significantly lower concentrations of CAT, GSH, and vitamins (C and E) were found in both the treated and untreated diabetic groups. Although insulin therapy caused a significant decrease in blood sugar with a marked elevation in the levels of insulin, CAT, GSH and vitamin E compared to the untreated patients, the changes in the levels of MDA and vitamin C between diabetic groups were not significant. Moreover, the level of insulin resistance was significantly increased in insulin-treated patients as compared to the control and untreated diabetic groups. In conclusion, twice daily treatment with regular and NPH insulin can ameliorate hyperglycemia and improve antioxidant levels in patients with T1DM. However, the insulin regimen used in this study did not reveal a beneficial effect on oxidative stress and insulin resistance. Hence, exogenous antioxidants (vitamins C and E) can be used in combination with insulin to control these parameters