

Comparative effects of metformin and glibenclamide on the redox balance in type 2 diabetic patients

Abstract:

It is known that there is a strong association between oxidative stress and insulin resistance in type 2 diabetes mellitus (T2DM). Although the role of glibenclamide in diabetes treatment has been evaluated, there is only limited evidence about its antioxidant effects in diabetic patients. Moreover, previous studies showed discrepant results regarding the effects of metformin on antioxidant/ oxidant parameters in type 2 diabetic patients .The present study aimed to evaluate the effects of metformin versus glibenclamide on oxidative stress biomarkers, represented by serum malondialdehyde (MDA), nonenzymatic, and enzymatic antioxidants in type 2 diabetic patients. Forty-six patients with T2DM participated in this study and categorized into 3 groups, Group A included 17 newly diagnosed diabetic patients, group B included 15 diabetic patients received metformin monotherapy (1000 mg/day) for up to 1 year and group C included 14 diabetic patients received glibenclamide monotherapy (5 mg/day) for up to 1 year. Serum MDA, catalase (CAT), vitamin C, E, and reduced glutathione (GSH) were measured. We found significantly lower concentrations of MDA and significantly higher antioxidant levels (CAT, GSH, vitamin C, and E) in the metformin-treated group compared to the glibenclamide counterpart.

Our data confirmed that metformin has a more beneficial effect on oxidant/antioxidant status compared to glibenclamide, therefore, provides protection against reactive oxygen species (ROS) induced oxidative damage during diabetes.