

Increased accumulation of glycooxidation product in human plasma in diabetes mellitus

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The complex interplay between glycation and oxidative stress forms an integrated vicious cycle because reactive oxygen species in diabetes accelerates glycation reaction and collectively referred to as “glycooxidation”. This subsequently contributes to the progression of vascular complications in diabetes. The aim of present study was to investigate the levels of glycooxidation markers in 70 type 2 diabetic and 40 healthy control. Various markers were assessed for glycooxidation such as protein carbonyls, thiols, nitric oxide and total antioxidant capacity. Protein carbonyls levels were significantly amplified ($p < 0.001$) in diabetic patients as carbonyl level was 21.23 nmol/mg protein as compare to 18.84 nmol/mg protein in controls. Protein thiols the major antioxidant in plasma was found to be decreased in diabetic patients 1.16 nmol/mg protein as compare to 1.36 nmol/mg protein in controls ($p < 0.001$). The plasma total antioxidant capacity as assayed by the FRAP method was found to be $24.63 \pm 9.2 \mu\text{mol}$ in diabetic patients, which is significantly lower ($p < 0.001$) than that of control subjects ($32.87 \pm 14.6 \mu\text{mol}$). Additionally decreased nitric oxide levels were found in diabetic patients than controls. Cumulatively, these results demonstrate the complex interplay between glycation, glycooxidation and oxidative stress generation in type 2 diabetes as the glycated proteins eventually degrade due to glycooxidation. Thus, the overall results emphasize the induced glycatory and glycooxidation modifications of plasma proteins due to type 2 diabetic conditions.

Biography

Komal H. Advani is a final year M.Sc. Biotechnology student doing her thesis/ dissertation project under Dr. Rashmi Tupe at Rajiv Gandhi Institute of Information technology and Biotechnology, Bharati Vidyapeeth Deemed University Pune.

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