Serum levels of soluble Fas ligand, Tumor necrosis factor-α and their soluble receptors in type I and type II diabetic patients: Relationships with glycemic control and oxidative stress

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Abstract:

Abstract Objectives: (1) To investigate the dysregulation of apoptotic modulators in type I and type II diabetes. Serum levels of soluble Fas (sFas), sFas ligand (sFasL), tumor necrosis factor-alpha (TNF-α) and its soluble receptor I (sTNF-RI), thiobarbituric acid reactive substances (TBARS) and nitric oxide (NO) were determined. (2) To evaluate the relationships of these bio-indices with glycemic control, disease complications (diabetic neuropathy) and duration. Patients and Methods: Sixty diabetic patients (30 type I and 30 type II diabetes) were sub-classified into non-complicated diabetic patients and patients with diabetic neuropathy. Patients were also subdivided according to glycemic control (HbA1c ≤ vs. > 11%) and diabetes duration (≤ vs. > one year). Each diabetic group was compared with its related age-matched control group. The serum levels of sFas, sFasL, TNF-α and sTNF-RI were determined using specific ELISA assays. The serum levels of HbA1c, NO and TBARS were measured by colorimetric methods. Results: In types I and II diabetes, serum levels of sFas, TNF-α, sTNF-RI, TBARS and NO were significantly higher in non-complicated and complicated diabetes than controls. These indices were found significantly higher in complicated than non-complicated diabetic patients Serum sFasL level was undetectable in controls while it was significantly higher in complicated than non-complicated type I patients. sTNF-RI level was significantly higher in patients with duration longer than 1 year than newly discovered cases. Significant increases in the investigated bio-indices were observed in types I and II diabetic patients with average and poor glycemic control compared to controls. Poor glycemic control showed significantly higher levels of TNF-α in types I and II patients. TBARS and sFas levels were significantly higher in type II diabetic patients with poor glycemic control. There were significant positive correlations among the investigated biochemical indices and indicators of glycemic control, oxidative stress and duration of the disease particularly in type I diabetes. Conclusion: Type I and II diabetes are associated with dysregulated apoptotic modulators as shown by upregulation of sFas, sFasL, TNF-α, sTNF-RI, TBARS and NO. Chronic complications of diabetes, bad glycemic control and increased duration of diabetes may be involved in the dysregulation of apoptotic modulators.

Keywords:

Diabetes mellitus, Apoptosis, sFas, sFasL, TNF-α, sTNFR-I, NO, TBARS

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