Inactive Matrix Gla Protein in Relation to Renal and Cardiac Functions in Type 2 Diabetes Patients

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Background:

Matrix Gla protein (MGP) is a robust innate suppressor of the detrimental process of vascular calcification in the human body.

Objectives:

The interrelationship between circulating MGP levels and renal and cardiac dysfunction, besides echocardiographic calcification score (ECS) was investigated in a sample of type 2 diabetes (T2D) patients.

Methods:

The study included 130 subjects.
They were 95 patients with T2D and 35 age- and sex-matched healthy controls. Patients were further subdivided into 52 T2D patients without DKD (eGFR ≥ 60 ml/min/ 1.73m²) and 43 T2D persons with DKD (eGFR < 60 ml/min/ 1.73m²). Serum MGP levels, determined by ELISA, renal function tests, lipid profile, and echocardiography were studied in all participants.

Results:

Significantly elevated circulating inactive MGP level was noted in individuals having T2D compared to controls. It correlated negatively with eGFR and left ventricular (LV) diastolic and systolic functions and positively with indices of LV hypertrophy. ECS was significantly increased in both T2D groups compared to controls and in DKD group compared to the diabetic group without DKD. A significant positive correlation was observed between inactive MGP and ECS.

Conclusion:

Serum-inactive MGP may contribute to the development of DKD and to the associated process of cardiac valvular calcification. It may be a beneficial diagnostic marker for early prediction of cardiac calcification and preclinical LV systolic and diastolic dysfunction in T2D patients, especially in those complicated with DKD.

Keywords:

Inactive MGP, Type 2 diabetes, Cardiac dysfunction, Diabetic kidney disease, Cardiac valvular calcification.