Uric acid serum level affects serum level of cystatin C, independently of GFR, in patients with type 2 diabetes

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Background and aims: Cystatin C has been reported to be a reliable marker of GFR in both type1 and type 2 diabetic patients with mild-to-moderate CKD (stages 2-3). Recently, elevated serum level of cystatin C has also been identified as a significant prognostic indicator for the development of cardiovascular disease in people with diabetes. However, there are limited data on factors, other than GFR, that influence its serum concentration, especially in adult patients with type 2 diabetes. The aim of our study was to identify such factors.

Materials and methods: In this cross-sectional study, 560 consecutive type 2 diabetic patients (252 men, 308 women), aged 65.0 ± 10.0 years (mean$\pm$SD) were recruited from our outpatient diabetic clinic. All participants were Europids. GFR was measured using 51Cr-EDTA (mGFR). Serum cystatin C was related to several clinical and biochemical parameters. Multivariate analysis was performed in order to identify factors independently associated with cystatin C serum level beyond mGFR. SPSS 18.0 was used for statistical analysis. A value of $p<0.01$ was considered to indicate statistical significance.

Results: Cystatin C was significantly correlated with mGFR ($r = -0.590$; $p<0.001$), age ($r = 0.365$; $p<0.001$), ACR-albumin creatinine ratio ($r = 0.159$; $p=0.001$), uric acid ($r = 0.299$; $p<0.001$), albumin ($r = -0.206$; $p<0.001$) and Hb ($r = -0.230$; $p<0.001$). There were no significant relationships between serum cystatin C levels and other variables (diabetes duration, sex, glucose-lowering therapy, BMI, fasting glucose, HbA1c, liver function tests, lipid profile, thyroid function tests, white blood cells, electrolytes and hsCRP). However, in standard multiple regression analysis, only mGFR ($B= -0.008$; $p<0.001$) and uric acid ($B= 0.040$; $p=0.008$) were independent predictors of cystatin C level.

Conclusion: In adult patients with type 2 diabetes, uric acid serum level seems to affect cystatin C serum level independently of GFR. Hence, uric acid level should be considered when cystatin C based equations for GFR estimation are used.

Clinical Trial Registration Number: NCT01215994