Urinary Immunoglobulin G as A Parameter for Early Detection of Chronic Kidney Disease in Patients with Metabolic Syndrome

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Background and Aim:

Both metabolic syndrome (MetS) and chronic kidney disease (CKD) are silent major global health issues and are major risk factors of all cause death and cardiovascular death. Patients with MetS are at a significantly higher risk for CKD. Urinary IgG is an important marker protein for early glomerular damage and increased urinary IgG levels was found to be useful predictor of diabetic kidney disease in normoalbuminuric patients. We aimed to assess urinary immunoglobulin G (IgG) levels as a predictor of early CKD in subjects with MetS.

Methods:

A cross-sectional study with 81 adult individuals were enrolled. All participants were divided into 2 groups: with MetS (56 in MetS group) and without MetS (25 in non-MetS group), with MetS being identified using the NCEP-ATPIII criteria. Patients with known CKD, DM, neoplasm, infection or autoimmune diseases and pregnant women were excluded. Anthropometric, clinical and biochemical measures including urinary albumin/creatinine ratio (ACR), serum fasting plasma glucose, creatinine, lipid profiles, Haemoglobin A1c and fasting plasma Insulin were performed for all participants. IgG concentrations were measured by using human enzyme-linked immunosorbent assay (ELISA) and correlated these levels with urinary ACR and estimated glomerular filtration rate (GFR). CKD was identified by albuminuria and estimating GFR using the CKD-EPI equation. Logistic regression models were used to estimate the chances of elevated urinary IgG levels associated with MetS and its components.

Results:

showed that as compared with the non-MetS group, the adjusted odds ratios (ORs) of elevated urinary IgG levels were 7.7 in MetS group. Unadjusted analysis showed that the ORs of elevated urinary IgG levels were associated with elevated waist circumference, hypertension, elevated FBG and reduced HDL-c but not with elevated TG. In the adjusted model, ORs of elevated urinary IgG levels were 19.16 (OR: 19.16; 95% CI: 4.40-83.5, P<0.001) for elevated waist circumference, 3.53 (OR: 3.53; 95% CI: 1.03-12.2, P<0.05) for low HDL-c. TG/ HDL-c ratio, urinary ACR and HOMA-IR were significantly higher in the MetS group than in the non-MetS group (all P<0.05). Elevated urinary IgG levels was significantly correlating with urinary ACR (P<0.019) and showed statistically high significant negative correlation with absolute values eGFR.

Conclusion:

It is suggested that elevated urinary IgG levels could be a predicting biomarker for CKD in MetS normoalbuminuric subjects. From MetS components, mainly abdominal obesity accounted for the greatest strength of association with elevated urinary IgG levels. More attention should be focused on visceral obesity during risk management in order to prevent CKD and further research into the mechanism behind is needed.

Keywords:

Metabolic syndrome; chronic kidney disease; urinary immunoglobulin G.