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Marker of lipid peroxidation related to diabetic nephropathy in Indonesian type 2 diabetes mellitus patients

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Case Study: Objective
Even though diabetes patients exhibit an increased oxidative stress, its correlation with diabetic nephropathy is not fully understood. The purpose of this study was to determine whether lipid peroxidation marker correlates well with eGFR and UACR in type 2 diabetes mellitus patients.
Methods
collected urine and serum samples of Indonesian type 2 diabetes mellitus outpatients with normo- and microalbuminuria at a Local Clinic (from ages: 39–74 years). Urinary 8-iso-PGF2α was measured by ELISA, the serum malondialdehyde by TBARS assay, and urinary albumin by BCG albumin assay. eGFR was calculated using the corrected-Cockcroft–Gault (CG), MDRD, and CKD-EPI equation.
Results
The results showed that the increasing level of malondialdehyde was mildly correlated with the decline in eGFR (MDRD). In contrary, there was a significant positive correlation between 8-iso-$PGF_{2\alpha}$ concentration and eGFR based on the corrected-CG, MDRD study, and CKD-EPI equation ($r = 0.457$, $p < 0.001$; $r = 0.424$, $p < 0.001$; $r = 0.443$, $p < 0.001$). This relationship still persisted in the normoalbuminuric subjects ($n = 43$)
($r = 0.491$, $p = 0.001$; $r = 0.461$, $p = 0.002$; $r = 0.455$, $p = 0.002$). The multivariate analysis showed that 8-iso-$PGF_{2\alpha}$ together with fasting plasma glucose was the most predictive factor for the high 2-quantile eGFR (adjusted OR 1.001, (95% CI, 1.000–1.001)). However, there was no significant correlation between UACR with malondialdehyde ($r = 0.268$, $p = 0.050$) and 8-iso-$PGF_{2\alpha}$($r = -0.030$, $p = 0.808$). UACR itself was inversely correlated with eGFR based on the corrected-CG, the MDRD, and CKD-EPI
($r = -0.232$, $p < 0.05$; $r = -0.228$, $p < 0.05$; $r = -0.232$, $p < 0.05$).
Conclusions
Increased 8-iso-$PGF_{2\alpha}$ and malondialdehyde in type 2 diabetes mellitus patients may play a role in the pathophysiologic significance of diabetic nephropathy, even while considering the effect of potential confounders.