HIGH INCIDENCE OF FALSE POSITIVE RESULTS OF NGAL AS MARKER OF ACUTE RENAL FAILURE IN CHRONIC KIDNEY DISEASE PATIENTS: PROGRESSIVE EFFECT OF IMPAIRMENT IN GFR

Carlo Donadio
1University of Pisa, Clinical and Experimental Medicine, Pisa, Italy

Introduction and Aims: Plasma and urinary Neutrophil Gelatinase-Associated Lipocalin (NGAL), are markers of acute kidney injury (AKI). The aim of this study was to assess the effect of the reduction of GFR on plasma and urinary NGAL concentrations in stable chronic kidney disease (CKD) patients at different functional stages.

Methods: GFR (99mTc-DTPA), plasma and urinary concentrations of NGAL were measured in 310 clinically stable CKD patients, at functional stages from 1 to 5. Serum and urinary low-molecular-weight proteins cystatin C and β2-microglobulin, and urinary tubular enzymes were measured for comparison. Plasma NGAL, cystatin C and β2-microglobulin were measured also in 31 maintenance hemodialysis patients.

Results: Plasma NGAL increased with the reduction of GFR in CKD patients already from stage 2. Urinary NGAL increased slightly but significantly in patients at CKD stages 4&5, similarly to urinary cystatin C and β2-microglobulin. In maintenance hemodialysis patients, plasma NGAL values were markedly increased, and high-flux hemodialysis significantly decreased their concentrations.

Conclusions: Plasma NGAL increases markedly with the reduction in GFR, generating a very high number of false positive diagnoses of AKI in stable CKD patients. The grade of GFR impairment and the cause of kidney disease have a lower effect on urinary NGAL. In any case, specific reference values of plasma and urinary NGAL should be used in CKD patients, according to their functional stage, when assessing acute kidney injury in patients with impaired GFR.