

Osteoprotegerin and Osteoprotegerin/TRAIL Ratio are Associated with Cardiovascular Dysfunction and Mortality among Patients with Renal Failure

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Abstract : Background: The high prevalence of cardiovascular morbidity and mortality among patients with chronic kidney disease (CKD) is observed especially in those undergoing dialysis. Osteoprotegerin (OPG) and its ligands, receptor activator of nuclear factor kappa-B ligand (RANKL) and tumor necrosis factor-related apoptosis-inducing ligand (TRAIL) have been associated with cardiovascular complications. Our aim was to study their role as cardiovascular risk factors in stage 5 CKD patients. Methods: OPG, RANKL and TRAIL concentrations were measured in 69 hemodialyzed CKD patients and 35 healthy volunteers. In CKD patients, cardiovascular dysfunction was assessed with aortic pulse wave velocity (AoPWV), carotid artery intima-media thickness (CCA-IMT), coronary artery calcium score (CaSc) and N-terminal pro-B-type natriuretic peptide (NT-proBNP) serum concentration. Cardiovascular and overall mortality data were collected during a 7-years follow-up. Results: OPG plasma concentrations were higher in CKD patients comparing to controls. Total soluble RANKL was lower and OPG/RANKL ratio higher in patients. Soluble TRAIL concentrations did not differ between the groups and OPG/TRAIL ratio was higher in CKD patients. OPG and OPG/TRAIL positively predicted long-term mortality (all-cause and cardiovascular) in CKD patients. OPG positively correlated with AoPWV, CCA-IMT and NT-proBNP whereas OPG/TRAIL with AoPWV and NT-proBNP. Described relationships were independent of classical and non-classical cardiovascular risk factors, with exception of age. Conclusions: Our study confirmed the role of OPG as a biomarker of cardiovascular dysfunction and a predictor of mortality in stage 5 CKD. OPG/TRAIL ratio can be proposed as a predictor of cardiovascular dysfunction and mortality.

Keywords : osteoprotegerin, tumor necrosis factor-related apoptosis-inducing ligand, receptor activator of nuclear factor kappa-B ligand, hemodialysis, chronic kidney disease, cardiovascular disease

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