말기신부전증 환자에서 심장 표지자의 이해

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Understanding Cardiac Biomarkers in End-Stage Renal Disease

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Cardiovascular disease is the leading cause of morbidity and mortality in patients with end-stage renal disease (ESRD). Therefore, early identification of patients, who have ESRD and are at a high risk of cardiovascular disease, may facilitate more aggressive and focused treatment. Accumulating evidence has suggested that some serum biomarkers are useful in profiling cardiovascular risk and detecting cardiovascular abnormalities in these patients. Since two important cardiac pathophysiological processes in ESRD patients are myocardial ischemia and abnormal left ventricular structure and/or function, the cardiac troponins and B-type natriuretic peptide (BNP) are among the best studied biochemical markers of cardiovascular disease in ESRD patients. Cardiac troponin I (cTnI) or cardiac troponin T (cTnT) levels, which have been attributed to coronary artery atherosclerosis, microcirculatory disturbances, or increased sympathetic tone, have been demonstrated to be closely linked with all-cause and cardiac mortality in ESRD patients. Abnormal left ventricular structure and function is associated with increased concentrations of BNP, which is also predictive of mortality in dialysis patients, and available assays measure the active hormone, referred to as BNP-32, and the inactive N-terminal component, referred to as NT-BNP-76 (NT-pro-BNP). In general, more than 50% of dialysis patients have elevated serum cTnT levels, and BNP and NT-pro-BNP levels are almost invariably increased in ESRD patients. However, merely elevated concentrations of these biomarkers in ESRD patients do not definitely mean the presence of coronary artery disease and left ventricular pathology. Most of all, a better understanding of day to day variability of troponins and BNP, determining cutoff values, and standardization of assays will be more important to a further utilization of these biomarkers for cardiovascular risk stratification in the ESRD population.