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Clinical significance of soluble ST2 for the evaluation of volume status in kidney transplant recipients

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Objectives: Cardiovascular disease is one of the main causes of death in kidney transplant recipients (KTRs) and is associated with volume status. Although soluble ST2 (sST2), which is associated with cardiac matrix remodeling by cardiovascular events, has been considered as a novel cardiac biomarker with N-terminal pro-B-type natriuretic peptide (NT-proBNP) in the general population, the association between volume status and cardiac markers in KTRs is uncertain. Therefore, we investigated the clinical significance of sST2 for the evaluation of volume status in KTRs.

Methods: We retrospectively analyzed the medical records of 100 KTRs measured sST2 at Keimyung University Dongsan Hospital between 2019 and 2021. We divided them into two groups based on the median value of sST2 of 23.0 ng/mL. We performed body composition monitor (BCM), echocardiography and cardiac markers such as CK-MB, troponin-I, and NT-proBNP. Hyperhydrated status was defined as the hydration status-to-extracellular water ratio (Δ HS) > 15% in BCM.

Results: The rate of male gender, dialysis vintage and serum CK-MB level were significantly higher in the higher sST2 group than in the lower sST2 group (80% vs. 42%, $P < 0.001$; 66.6 ± 71.3 vs. 35.0 ± 47.6 months, $P = 0.014$; 3.5 ± 3.0 vs. 1.5 ± 0.9 mg/dL, $P = 0.002$). Plasma NT-proBNP level, serum troponin-I level, and the rate of hyperhydrated status were higher in the higher sST2 group than in the lower sST2 group, but there was no significant difference between the two groups. Hyperhydrated status, NT-proBNP, CK-MB, and troponin-I were significantly associated with sST2 levels ($r = 0.548$, $P = 0.005$; $r = 0.248$, $P = 0.027$; $r = 0.415$, $P = 0.006$; $r = 0.405$, $P = 0.007$). However, the parameters in echocardiography (left ventricular mass index, ejection fraction, and left ventricular & atrial diameters) were not associated with sST2 levels.

Conclusions: sST2 with cardiac markers and BCM might be helpful to evaluate the volume status in KTRs.