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Clinical significance of soluble ST2 for the evaluation of volume status in hemodialysis patients: a single-center study

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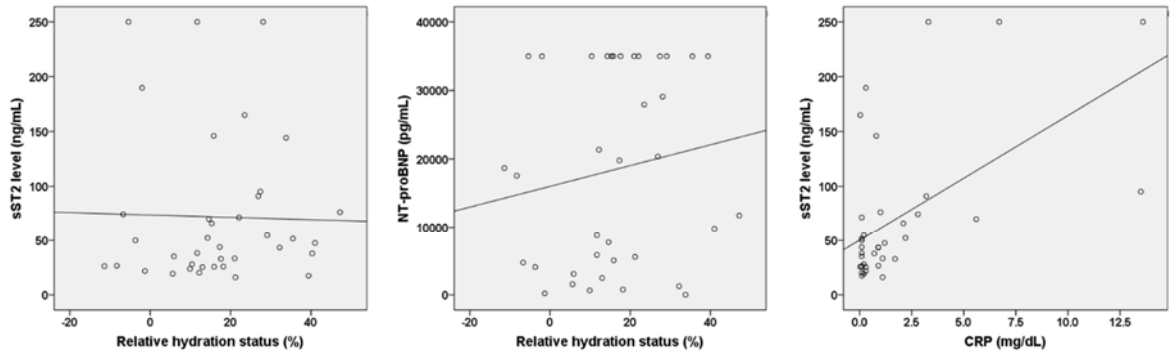
Objectives: We investigated the clinical significance of soluble ST2 (sST2), which is associated with cardiac matrix remodeling by cardiovascular events, for the evaluation of volume status in hemodialysis patients.

Methods: We retrospectively analyzed the medical records of 39 hemodialysis patients measured the sST2 between 2019 and 2020. We divided them into two groups based on the median value of sST2 of 43.8 ng/mL. We performed body composition monitor (BCM), transthoracic echocardiography (TTE) and NT-proBNP. Relative hydration status (ΔHS, %) was defined in terms of the hydration status-to-extracellular water ratio with a cutoff of 15%, and hyperhydrated status was defined as ΔHS > 15%.

Results: Mean age and dialysis duration were higher in higher sST2 group than in lower sST2 group (66 ± 10.5 vs. 59.3 ± 13.9 years; 47.3 ± 54.5 vs. 22.3 ± 28.2 months). Plasma NT-proBNP and C-reactive protein (CRP) levels were significantly higher in higher sST2 group than lower sST2 group (22806.3 ± 13422.8 vs. 12864.2 ± 13740.1 pg/mL, P=0.030; 3.0 ± 4.2 vs 0.5 ± 0.5 mg/dL, P=0.018). Serum CK-MB, and troponin-I levels were also higher in higher sST2 group than lower sST2 group, but there were no significant differences between the two groups. Mean amount of volume overload and hyperhydrated status were higher in higher sST2 group than lower sST2 group, but there were no significant differences between the two groups. Mean amount of volume overload and hyperhydrated status were not associated with sST2 levels, unlike NT-proBNP. Furthermore, cardiac markers (left ventricular mass index, ejection fraction, and left atrial diameter) were also not associated with sST2 levels, unlike NT-proBNP. However, sST2 levels were significantly associated with CRP and NT-proBNP levels

Conclusions: It may be helpful to use sST2 and NT-proBNP together to evaluate the volume status in hemodialysis patients, not sST2 alone.

Figure 1. Correlation between (A) sST2 level or (B) NT-proBNP and relative hydration status of individuals in the study population or correlation between (C) sST2 level and CRP level.



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