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Assessment of volume status in edematous chronic kidney disease patients; what to choose

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Objectives : Chronic volume overload is an important independent prognostic factor in patients with chronic heart failure and chronic kidney disease. In the clinic, management of volume overload are commonly determined by physical examination and evaluation of signs of the disease, which could be inaccurate and lead to volume depletion. Therefore, more objective assessment of volume status is needed for management and optimization of volume status in clinically edematous patients.

Methods : We conducted a prospective observational study in patients with chronic kidney disease (estimated GFR < 60ml/min/m2) who visited hospital due to generalized edema including peripheral edema and pulmonary edema. During hospitalization, volume status was evaluated using body composition monitor (BCM-Fresnius Medical Care, OH=overhydration (L), ECW=extracellualar water (L), ICW=intracellular water (L)) and cardiac function were evaluated using 2D-echography.

Results : Of total 29 patients, 19 (67.9%) were diagnosed as type 2 diabetes, 20 (71.4%) as hypertension. Patients' edema was treated with diuretics (furosemide (60.7%), spironolactone (7.1%), thiazide (7.1%)) and low salt diet or low salt diet only. Mean age of the patients was 58.9± 14.5. 11 (39.3%) patients had left ventricular hypertrophy, and all patients had abnormally increased left atrial volume (45.01±10.36). BCM value and 2-D Echography were followed up after 1 week (Table 1). At baseline and 1 week later, there were little correlations with overhyration value (OH, ECW, ECW/ICW) with ejection fraction, left atrial volume and end-diastolic left ventricle diameter. Patients' symptoms were relieved during the treatment period with a significant weight difference (p value < 0.001). However, there were no significant differences in 2-D echo findings during 1 week. Among overhydration value, change of ECW and ECW/ICW was significantly correlated with weight change (p value < 0.001, [r=0.705], p=0.018, [r=.460]). However, there were no significant correlations between body weight change and echographic

measurements.

Conclusions : Current findings suggest that volume status may be more accurately assessed with bed side body composition monitor than echographic measurement.

Keywords : volume overload, chronic kidney disease, 2-D echography