

## Management of HD patients with heart failure and pleural effusion

\*Sun-hee PARK

Division of Nephrology and Department of Internal , Kyungpook National University Hospital, Korea, South

Many epidemiologic studies have shown that higher prevalence of cardiovascular diseases (CVD) among patients with dialysis compared to the general population. In addition, CVD is a major cause of death in patients with ESRD. The results of the Hemodialysis Study have shown that 40% of patients on HD have congestive heart failure (CHF). Left ventricular hypertrophy (LVH) is the most frequent cardiac abnormality diagnosed in patients starting HD and it is an independent risk factor for cardiovascular mortality in ESRD patients. Eccentric hypertrophy results from volume overload, whereas concentric LVH is mainly the result of hypertension and increased afterload and is exacerbated by anemia, hyperparathyroidism, and activation of renin-angiotensin system (RAS). Overload cardiomyopathy is accompanied by myocyte death, myocardial fibrosis and decreased capillary perfusion, which leads to LV dilatation. These events finally manifest as LV diastolic dysfunction or may progress to LV systolic dysfunction. Among dialysis patients diagnosed as HF, many treatable conditions including uncontrolled hypertension, ischemic heart disease or valvular disease, high output failure due to HD vascular access, anemia and carnitine deficiency may contribute to HF and therefore, these conditions should be corrected at first. Next, regarding pharmacologic therapy, several medications for HF cannot be routinely applied in HD patients due to inadequate effects or serious side effects; for example, no therapeutic response to diuretics or hyperkalemia of RAS blockade or aldosterone receptor antagonists. Therefore, maintenance of euvolemia is a main approach in HD patients with HF with balancing interdialytic hypervolemia and intradialytic hypovolemia. For patients with systolic dysfunction, beta-blocker is recommended as initial medical therapy at lower dose to minimize the risk of hemodynamic deterioration. HD patients with HF who tolerate the beta-blocker, addition of angiotensin-converting enzyme (ACE) inhibitor is recommended. Regarding dialysis therapy, ESRD patients with advanced HF could not tolerate hemodynamic shift during conventional HD. HF often exacerbated due to intradialytic increased of intravascular volume. However, removing excess intravascular fluid during single HD session is often very difficult due to left ventricular (LV) dysfunction and chronic hypotension. So much the worse, these patients are suboptimally treated with standard therapy for HF using beta-blocker and/or renin-angiotensin inhibitors due to hypotension. Intensive HD including short daily and nocturnal treatment lessens the unphysiologic

## KSN 2017 Abstract

nature of conventional dialysis and may improve cardiovascular outcomes. Short daily and nocturnal schedules in the Frequent Hemodialysis Network trial reduced left ventricular mass compared to conventional dialysis. Although randomized clinical trials evaluating the effects of intensive HD on cardiovascular outcomes are not sufficient, large observational studies have shown that intensive HD is associated with lower risks for cardiovascular death and hospitalization, especially for heart failure, compared to conventional HD. In summary, maintenance of euvolemia is an essential step for HF patients on HD. Upon aggravation, many treatable conditions of HF should be corrected at first. Pharmacologic therapy should be maintained or added for patients who tolerate medications without side effects. In addition, individualized dialysis mode based on hemodynamic burden of specific patient is important for management of HF in HD patients.