Kidney Venous Flow Data Help to Predict Cardiorenal Events in HF

In patients with heart failure (HF), baseline and follow-up changes in kidney venous flow (KVF) provide information on the risk of cardiorenal events, reports a study in the *Journal of the American Heart Association*.

The observational cohort study included 216 consecutive cardiology inpatients with HF who were referred for nephrology evaluation of diuretic resistance and abnormal kidney function. Sixty percent of patients were men; median age was 76 years. Approximately 69.4% of patients had advanced chronic kidney disease, with an estimated glomerular filtration rate (eGFR) of <45 mL/min/1.73 m^2; 66% were receiving combined diuretic therapy.

Patients underwent Doppler spectral kidney assessments at baseline and 25–35 days later to assess patterns of intrarenal KVF (IKVF) and kidney venous stasis index (KVSI). These values were analyzed for association with risk of cardiorenal events.

At up to 18 months' follow-up, 126 patients died or had worsening HF. Risk of these adverse outcomes was associated with baseline KVSI (hazard ratio [HR], 1.49 per 0.1-unit increase) and baseline IKVF pattern (HR, 2.47 per increase in severity from continuous to pulsatile to biphasic to monophasic).

On analysis of 92 patients, increases in both KVSI and IKVF pattern from the first to second Doppler examination were also associated with risk of worsening HF or death: HR, 3.00 and 6.73, respectively. Results were similar on analysis of individual cardiorenal outcomes, initiation of kidney replacement therapy, and decline in eGFR.

Many patients hospitalized for HF have residual congestion at discharge, which may lead to oliguria and worsening HF. Few studies have evaluated the impact of changes in Doppler-derived KVF in patients with HF.

The new findings suggest that initial and subsequent changes in Doppler-derived KVSI and IKVF are predictors of adverse cardiorenal events in hospitalized patients with HF. The researchers write, "Future studies should aim to assess and validate the prognostic ability of serial KVF assessments in HF management" [Husain-Syed F, et al. Changes in Doppler-derived kidney venous flow and adverse cardiorenal outcomes in patients with heart failure. *J Am Heart Assoc* 2023; 12:e030145. doi: 10.1161/JAHA.123.030145].

BEST-Fluids Supports Balanced Crystalloids for Deceased Donor Transplant

Compared with saline solution, intravenous fluid therapy with a balanced crystalloid solution reduces the incidence of delayed graft function (DGF) after deceased donor kidney transplantation, reports a pragmatic randomized trial in *The Lancet*.

The double-blind Better Evidence for Selecting Transplant Fluids (BEST-Fluids) trial enrolled 808 patients undergoing deceased donor kidney transplantation at 16 hospitals in Australia and New Zealand between 2018 and 2020. The patients were 512 males and 296 females; mean age, 55 years; and four patients younger than 16 years old. Patients were randomly assigned to receive intravenous balanced crystalloid solution (Plasma-Lyte 148) or saline solution during surgery and up to 48 hours afterward. DGF, defined as need for dialysis within 7 days, was the main outcome of interest.

Incidence of DGF was 30% in the group assigned to balanced crystalloid solution compared with 40% in the saline group: adjusted relative risk, 0.74. The advantage of balance crystalloid solution persisted in sensitivity and subgroup analyses. The benefit appeared larger in patients receiving kidneys from donors after circulatory death compared with donors after brain death.

Secondary outcomes were similar between groups, including a ranked composite outcome of duration of DGF and creatinine reduction ratio on day 2. Serious adverse events occurred in three patients in the balanced crystalloid group and five in the saline group.

The choice of intravenous fluid therapy might affect the risk of DGF after deceased donor kidney transplant. Saline solution is the most common type of fluid therapy but may increase DGF risk due to its high sodium content. Previous data comparing balanced crystalloids with saline have shown low certainty of evidence.

The BEST-Fluids results show a reduced risk of DGF in deceased donor kidney recipients assigned to balanced crystalloid solution. Balanced crystalloids prevent approximately one case of DGF for every 10 patients treated, with no increase in serious adverse events or hyperkalemia. The investigators conclude: "Balanced crystalloid solution should be the standard-of-care intravenous fluid used in deceased donor kidney transplantation" [Collins MG, et al. Balanced crystalloid solution versus saline in deceased donor kidney transplantation (BEST-Fluids): A pragmatic, double-blind, randomised, controlled trial. *Lancet* 2023; 402:105–117. doi: 10.1016/S0140-6736(23)00642-6].