Combination diuretics had a similar effect on renal function and dyspnoea improvement as stepped doses of furosemide in patients with type 1 cardiorenal syndrome

The effect in Renal Function and Vascular Decongestion on Type 1 Cardiorenal Syndrome Treated with Two Strategies of Diuretics, a Pilot Randomized Trial


Reviewed by A Zykova

Summary: In this double-blind trial, 80 patients admitted to hospital with acute decompensation of heart failure and a concomitant acute kidney injury, and meeting criteria for cardiorenal type 1 syndrome, were randomly assigned to stepped furosemide (SF) or combined diuretics (CD) groups for 4 days. Patients in the SF group received a continuous infusion of furosemide with a stepwise dose increase from 100mg on day 1 to 400mg by day 4. Patients in the CD group received a furosemide infusion at 100mg/24 hours with the addition of oral chlorothalidone 50mg and spironolactone 50mg. All patients also received a daily 80mg furosemide bolus, and were on a <1 litre fluid restriction, and a <2.4g sodium restriction. There was no statistically significant difference in the incidence of renal function recovery after 4 days of treatment (relative risk 1.5, 95% confidence interval 0.4–5.2; p =0.49), although this endpoint only occurred in 8 patients in the SF group and 5 patients in the CD group. After 4 days, the daily urine output had increased by 125mL with stepped furosemide (with a large interquartile range [IQR] of 1662) compared with 200mL with combined diuretics (IQR 988; p for comparison =0.30). There were no significant differences in serum creatinine worsening at 96h, improvement in dyspnoea, in-hospital mortality, mortality at follow-up, or requirement for renal replacement therapy. The rates of hyponatraemia, hypokalaemia and metabolic acidosis were similar between groups. There were more hypotension events with stepped furosemide (10%) compared with combined diuretics (2.5%).

Comment: Despite the high frequency of cardiorenal syndrome type 1, a lack of large-scale trials has resulted in ongoing uncertainty about the best evidence-based use of diuretics. Diuretic resistance in acute heart failure is associated with renal impairment, increased risk of rehospitalisation, and mortality. A combined diuretic regimen can potentially overcome this phenomenon and decrease the dosage of loop diuretics to reduce additional RAAS stimulation and further renal impairment. In this trial the sequential blockade of the renal tubule with a combination of diuretics in patients with cardiorenal syndrome was similar to stepped furosemide alone. Further trials with larger sample size may be needed to answer the question of optimal diuretic therapy in type 1 cardiorenal syndrome more definitively.