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Impact of Dopamine Infusion on Renal Function in Hospitalized Heart Failure Patients: Results of the Dopamine in Acute Decompensated Heart Failure (DAD-HF) Trial

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Abstract Full Text PDF Images References

Abstract

Background

Worsening renal function (WRF) and hypokalemia related to diuretic use for acute decompensated heart failure (ADHF) are common and associated with poor prognosis. Low-dose dopamine infusion improves renal perfusion; its effect on diuresis or renal function specifically in ADHF is not known.

Methods and Results

Sixty consecutive ADHF patients (age 75.7 ± 11.2 years; 51.7% female; left ventricular ejection fraction 35.3 ± 12.1%) were randomized, after receiving a 40 mg intravenous furosemide bolus, to either high-dose furosemide (HDF, 20 mg/h continuous infusion for 8 hours) or low-dose furosemide combined with low-dose dopamine (LDFD, furosemide 5 mg/h plus dopamine 5 μg kg−1 min−1 continuous infusion for 8 hours). Both strategies were compared for total diuresis, WRF (defined as a rise in serum creatinine of >0.3 mg/dL from baseline to 24 hours), electrolyte balance, and 60-day postdischarge outcomes. Mean hourly excreted urine volume (272 ± 149 mL in HDF vs 278 ± 186 mL in LDFD group; P = .965) and changes in dyspnea score (Borg index: −4.4 ± 2.1 in HDF group vs −4.7 ± 2.0 in LDFD group; P = .575) during the 8 hours of protocol treatment were similar in the two groups. WRF was more frequent in the HDF (n = 9; 30%) than in the LDFD group (n = 2; 6.7%; P = .042). Serum potassium changed from 4.3 ± 0.5 to 3.9 ± 0.4 mEq/L at 24 hours (P = .003) in the HDF group and from 4.4 ± 0.5 to 4.2 ± 0.5 mEq/L at 24 hours (P = .07) in the LDFD group. Length of stay and 60-day mortality or rehospitalization rates (all-cause, cardiovascular, and worsening HF) were similar in the two groups.
Conclusions

In ADHF patients, the combination of low-dose furosemide and low-dose dopamine is equally effective as high-dose furosemide but associated with improved renal function profile and potassium homeostasis.

Clinical Trial Registration Information