Diuretic Therapy for Acute Decompensated Heart Failure: Putting Practice to the Test

Continuous infusion or bolus? Low or high dose? A comparative effectiveness trial provides needed data.

The use of diuretics for decompensated heart failure (HF) is well established but largely unstudied. Researchers from the National Heart, Lung, and Blood Institute HF Clinical Research Network conducted the Diuretic Optimization Strategies Evaluation trial to evaluate common strategies for dose and mode of administration.

Eligible patients presented with acute decompensated HF within the previous 24 hours, had chronic HF, and had received outpatient diuretic treatment for at least the preceding month. According to the 2 x 2 factorial design, patients were randomized to receive furosemide at either a low dose (equal to their total daily oral dose) or a high dose (2.5 times their total daily dose) and by either intravenous bolus every 12 hours or continuous infusion. The primary efficacy endpoint was the patient's global assessment of symptoms at 72 hours. The primary safety endpoint was the 72-hour change in serum creatinine level.

At baseline, the 308 participants (average age, 66; about 75% men) had a mean ejection fraction of 35% and a mean creatinine level of 1.5 mg/dL. The primary endpoints did not differ significantly between the groups for either comparison (high vs. low dose or bolus vs. continuous infusion), although global improvement in symptoms was slightly greater in high-dose than in low-dose patients (P=0.06). However, more high-dose than low-dose patients had an increase in creatinine level of >0.3 mg/dL (23% vs. 14%; P=0.04). The median length of hospital stay was similar in all groups, and readmission rates did not differ significantly among them.

Comment: This trial of diuretic therapy for HF is an important contribution to the evidence base. Continuous infusion, which has many advocates, was not superior to bolus administration. The results also suggest that compared with low doses, high doses confer some benefit with regard to diuresis and symptom relief but some harm with regard to renal function — although the primary endpoint did not differ between the dosage groups. An editorialist interpreted these findings as favoring the high-dose regimen. However, I believe that patients are generally better served by using less rather than more medication, unless the evidence clearly demonstrates benefit with more.

— *Harlan M. Krumholz, MD, SM*

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