Diuretics in Critically Ill Patients With Acute Renal Failure

To the Editor: Dr Mehta and colleagues[1] reported that patients in the intensive care unit who received diuretics for acute renal failure (ARF) had a higher risk of dying and nonrecovery of renal function than those who did not.

I am concerned that the authors' use of the odds ratios may misrepresent the difference in risk of death between the 2 groups, which would be better expressed with risk ratios. Odds ratios are not analogous to risk ratios, particularly when the outcome in question occurs commonly. The authors state that "diuretic use was associated with a 68% (95% confidence interval [CI], 6%-164%) increase in in-hospital mortality and a 77% (95% CI, 14%-176%) increase in the odds of death or nonrecovery of renal function." This statement is misleading and suggests a much larger increased risk from diuretics than was actually observed. The risk of dying with or without diuretics is very high and the actual increase in risk of death associated with diuretics was more on the order of 20% to 25%.

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1. Mehta RL, Pascual MT, Soroko S, Chertow GM, for the PICARD Study Group. Diuretics, mortality, and nonrecovery of renal function in acute renal failure. *JAMA*. 2002;288:2547-2553.

To the Editor: I am concerned that the sample in the study by Dr Mehta and colleagues[1] was biased, thus potentially confounding their results. Patients were included if they had ARF and received nephrology consultations. At the time of consultation, 59% of patients had already received diuretics. It seems likely that for most patients nephrology consultation was only pursued once diuretic therapy had been tried and was unsuccessful. For patients who had had a positive response to diuretic therapy, nephrology consultation would be deemed unnecessary and these patients would then be excluded from this study's sample, thus biasing the results toward an unfavorable outcome. The failure of response to diuretics and necessity of nephrology consultation would therefore be markers of severity of renal failure, not lack of utility of diuretics in all patients.

This sample may have been further compromised as only 65% of the patients eligible for the study had enough data to be included and analyzed. Overall, I believe a more correct implication of this study would be that intensive care unit patients with ARF who are unresponsive to therapy and sick enough to warrant nephrology consultation are unlikely to benefit from further diuretic therapy.

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1. Mehta RL, Pascual MT, Soroko S, Chertow GM, for the PICARD Study Group. Diuretics, mortality, and nonrecovery of renal function in acute renal failure. *JAMA*. 2002;288:2547-2553.

To the Editor: Dr Mehta and colleagues[1] suggested that the adverse outcome of diuretic use in patients with ARF is related either to a direct effect of diuretics or a delay in initiating dialysis. We are concerned that the results do not justify either of these conclusions.

As shown in Figure 2, higher mortality rates occurred in the patients given diuretics, but who were diuretic resistant (furosemide equivalent per milliliter ratio $\geq$1.0). Mortality rates were similar, however, for the no diuretic and diuretic-responsive groups. Thus, oliguric ARF had a poorer outcome than nonoliguric ARF. Failure to respond to diuretics reflects severe renal disease; the poor outcome in this group reflects the poorer prognosis of oliguric ARF.[2] No direct causal effect between diuretic use and poor outcome can be inferred from these results.

Mehta et al suggested that diuretic use prolonged the interval from consultation to dialysis. However, they offer no supporting data, such as number of patients from each group who received dialysis, modality used, or outcomes of dialysis. It is also not clear which group a patient would be assigned to if diuretics were administered prior to renal consultation but were subsequently discontinued. Although Mehta et al did match patients on propensity and APACHE (Acute Physiology and Chronic Health Evaluation) scores, the diuretic group appeared to have more significant cardiac and pulmonary disease. In any event, patients who respond to diuretics tend to have lower APACHE scores and better survival than those who do not respond.[3]

We agree that diuretics should be used judiciously in the setting of ARF. However, to attribute an increase in mortality to diuretics requires a randomized clinical trial.

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