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DIALYSIS

Does reducing dialysate sodium level lower blood pressure?

A recent study reports that reducing dialysate sodium concentration may help to improve blood pressure control in older patients and women, but that additional factors such as dietary sodium restriction are probably required in younger male patients.

"There has been debate as to whether lower sodium dialysate concentrations improve blood pressure control," explains Andrew Davenport, an author on the trial. "A previous audit at our centers in 2004 showed that lower sodium dialysates resulted in lower interdialytic weight gains and less hypotension during dialysis. Therefore, we reduced dialysate sodium concentrations in our hemodialysis population." The researchers then reaudited clinical practice in 2009 to determine whether the change had affected blood pressure control.

> "...the blood pressure effects were more noticeable in older patients and in women..."

The study included 278 outpatient hemodialysis patients who were under the care of the Royal Free Hospital in London, UK, and were receiving dialysis three times weekly at either the Royal Free Hospital or at one of six satellite dialysis centers. Patients were given dietary advice by a renal dietician with the aim of restricting sodium intake to about 100 mmol/l, but this restriction was not enforced.

From the initial audit in 2004 to the reaudit in 2009, mean dialysate sodium concentration decreased from 138.9 mmol/l to 137.8 mmol/l ($P<0.001$). Predialysis and postdialysis session mean arterial pressures also decreased (from 100.6 mmHg to 97.1 mmHg and from 91.7 mmHg to 87.7 mmHg, respectively). Use of antihypertensive agents decreased, with the percentage of patients being prescribed antihypertensives decreasing from 60.7% to 49.6%, and the mean number of antihypertensives prescribed decreasing from 1.05 to 0.86. Ultrafiltration requirements also decreased with the reduction in dialysate sodium, as did the number of hypotensive episodes.

Using multivariable linear regression models, the researchers found that the blood pressure effects were more noticeable in older patients and in women, and that effects were minimal in younger patients and in men. "Although we did not formally measure dietary sodium," states Davenport, "it is most likely that the effects of reduced dialysate sodium were more effective in patients with a lower dietary sodium intake—the elderly and female patients. This idea would help to explain variant previous reports, as centers with a high dietary sodium intake would not necessarily observe changes in blood pressure, whereas centers with a more restrictive dietary program would observe benefits in terms of blood pressure control." The researchers say that dialysate sodium is therefore only one factor involved in the management of hypertension in dialysis patients: "...our model showed that the effect on blood pressure was affected by both sex and age, and thus for lowered dialysate sodium concentrations to be effective, patients require additional dietary sodium restriction."

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