

DIALYSIS

Two dialyzers in parallel might improve phosphate control

Hyperphosphatemia is associated with increased mortality in patients on hemodialysis, and calcium-based phosphate binders are traditionally used to control serum phosphate levels in these patients. Observational data suggest, however, that an increased dosage of these phosphate binders is associated with increased vascular calcification, a process that may accelerate the development of cardiovascular disease in patients with end-stage renal disease.

Marcello Tonelli of the University of Alberta, Canada, recounts how he and his research collaborators “were struck that contemporary clinical literature tends to discuss new ways of binding dietary phosphate, rather than better ways of removing it using dialysis.” Analyzing data from a randomized crossover study, Tonelli *et al.* found that in overweight patients on hemodialysis, 4 h hemodialysis using two high-flux dialyzers in parallel (double-dialyzer hemodialysis) might improve serum phosphate control as compared with three other hemodialysis regimens.

Tonelli *et al.*'s study included 18 patients on hemodialysis with a dry weight of at least 80 kg (mean BMI 32.0 kg/m²). All participants received four different hemodialysis regimens each lasting 6 weeks, and the order in which each

regimen was implemented was randomly assigned to each patient.

Mean serum phosphate level before dialysis was significantly lower when patients received double-dialyzer hemodialysis than when patients received 4 h standard hemodialysis. This parameter was also lower with double-dialyzer hemodialysis, although not significantly, than with 4 h standard hemodialysis, 4.5 h hemodialysis or 4 h hemodialysis with increased dialysate flow. Mean serum phosphate level after dialysis was lower when patients were on double-dialyzer hemodialysis than when they were on either standard hemodialysis or increased dialysate flow. Finally, double-dialyzer hemodialysis was associated with greater phosphate clearance than any of the other three modalities tested, although no differences were observed in mean total phosphate removal.

Tonelli *et al.* point out their study's limitations, such as small size, short follow-up (3 months), inclusion only of overweight participants and crossover design. They also clarify that the study's low statistical power prevented analysis of clinically relevant outcomes, such as mortality or cardiovascular events.

The researchers conclude that, although double-dialyzer hemodialysis cannot be recommended at this stage, their data



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highlight the need to investigate further how different hemodialysis modalities affect removal of phosphate. Tonelli and colleagues plan to confirm the findings of their study in a larger parallel-group study that will analyze a wider range of outcomes.

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Original article Tonelli, M. *et al.* Phosphate removal with several thrice-weekly dialysis methods in overweight hemodialysis patients. *Am. J. Kidney Dis.* **54**, 1108–1115 (2009)