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Synopsis from the article : [Hauk M, Kuhlmann MK, Riegel W, Kohler H. In vivo effects of dialysate flow rate on Kt/V in maintenance hemodialysis patients. *American Journal of Kidney Diseases* 2000; 35: 105-11.](#)

Dialysis dose is an important factor influencing patient mortality. According to K/DOQI-guidelines, a minimum dialysis dose of single pool Kt/V = 1.2 per treatment should be achieved. However, depending on patient size, this goal may not be achieved with an average dialysis prescription. One potential means to increase dialysis dose without increasing dialysis time is raising dialysate flow rate (Qd). In vitro studies suggested that dialyzer urea clearance (Kd(urea)) may increase substantially by raising Qd, implying that dialysis efficacy may benefit from a greater Qd.

The effect of Qd on delivered dose of dialysis was studied in 23 maintenance hemodialysis (MHD) patients. Hemodialysis was performed at Qd of 300, 500, and 800 mL/min for at least 3 weeks each, while treatment time, blood flow rate [Qb], ultrafiltration volume, and type and size of dialyzer were kept constant. Delivered dialysis dose was assessed repeatedly (218 measurements) by single-pool Kt/V (Kt/V(sp)) and double-pool Kt/V (Kt/V(dp)). Mean \pm SEM Kt/V(sp) was 1.19 ± 0.03 at Qd of 300, 1.32 ± 0.04 at 500, and 1.45 ± 0.04 at 800 mL/min. Decreasing Qd from 500 to 300 mL/min resulted in a relative loss of Kt/V(sp) of $11.7\% \pm 8.7\%$, while increasing Qd from 500 to 800 mL/min yielded a relative gain in Kt/V(sp) of $9.9\% \pm 5.1\%$. Kt/V(dp) behaved similarly (changes by $11.2\% \pm 8.9\%$ and $10.3\% \pm 5.1\%$, respectively).

The observed gain in urea clearance by increasing Qd from 500 to 800 mL/min was significantly greater than predicted from mathematical modeling ($5.7\% \pm 0.4\%$; $P = 0.0008$). Removal rates for creatinine and beta₂-microglobulin, were not affected by increasing Qd from 500 to 800 mL/min. The proportion of patients with delivered Kt/V_{sp} <1.2 was reduced from 56% at Qd of 300 to 30% at 500 and further to 13% at 800 mL/min. It is concluded that raising Qd from 500 to 800 mL/min results in a significant increase in delivered Kt/V. A higher Qd of 800 mL/min should be considered in selected patients not achieving adequacy goals despite extended treatment times.

Commentary by Todd S. Ing, MD

Hauk et al. definitively showed that increasing dialysate flows from 300 to 500 mL/min and from 500 to 800 mL/min respectively could bring about improvements in dialyzer urea clearance. Raising dialysate flow rate to 800 mL/min should be helpful in patients who are not receiving adequate dialysis therapy.