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Synopsis from the article: Ayus JC, Mizani MR, Achinger SG, Thadhani R, Go AS, Lee S. Effects of Short Daily versus Conventional Hemodialysis on Left Ventricular Hypertrophy and Inflammatory Markers: A Prospective, Controlled Study. *Journal of the American Society of Nephrology* 2005;16:2778-88.

Two important risk factors for cardiac death among hemodialysis patients are left ventricular hypertrophy and chronic inflammation. Previous studies have suggested that more frequent hemodialysis can have beneficial effects on the heart. We performed a non-randomized, controlled trial comparing the effect of short daily (6 sessions/week of 3 hours each) and that of conventional (3 sessions/week of 4 hours each) hemodialysis on these factors. In our study, we followed 26 short daily hemodialysis patients who chose to undergo short daily hemodialysis and 51 matched conventional hemodialysis control patients for one year. Baseline and 12-month measures of echocardiographic left ventricular mass index, erythropoietin resistance index, C-reactive protein, calcium, phosphorus and intact parathyroid hormone were obtained.

At baseline, the groups were similar except that the hemoglobin and calcium levels were lower and the serum phosphorus value was higher in the short daily dialysis group. In the short daily dialysis subjects there was a 30% decrease in left ventricular mass index (154 ± 33 to 108 ± 25 g/m^2, P<0.0001) and a 32.9% decrease in serum phosphorus level (6.26 ± 2.57 to 4.2 ± 1.16 mg/dl, P<0.0001) at 12-month follow-up. Short daily dialysis treatment (ß=-41.63, P=0.03) and percent decrease in serum phosphorus concentration (ß=-0.12, P=0.04) predicted the 12-month reduction in left ventricular mass index, after adjustment for potential confounding factors. Additionally short daily dialysis was associated with reductions in median C-reactive protein levels, 1.22 (0.37, 3.70) to 0.05 (0.05, 1.17) mg/dl, P<0.01, and in the erythropoietin resistance index, 19.5 (8.6, 37.6) to 10.5 (5.5, 14.6), P<0.001. Left ventricular mass index, serum phosphorus value, C-reactive protein level and erythropoietin resistance index did not change in the conventional dialysis group. While blood pressures were different between the two groups, there was no change in these measurements in either the short daily dialysis group or in the conventional dialysis group at the12-month follow-up.

In conclusion, short daily hemodialysis is associated with improvements in phosphorus and fluid control, as well as reductions in left ventricular hypertrophy and inflammatory markers when compared with conventional hemodialysis. Future trials are needed to determine the effects of short daily dialysis on mortality in dialysis patients.

Commentary by Todd S. Ing, MD

Dr. Ayus and his colleagues demonstrated convincingly that, compared to the conventional, thrice weekly (4 hours for each session) hemodialysis regimen, a short daily regimen (6 sessions of 3 hours each weekly) can bring about better fluid and phosphorus control as well as improvements in left ventricular hypertrophy and inflammatory markers. This study is significant because left ventricular hypertrophy got better in spite of the absence of blood pressure improvement, making one wonder if the cardiac improvement is a result of better total fluid volume control (even without blood pressure control), smaller swings in fluid or other chemical parameters, better phosphorus control, or reduction of inflammation.