Optimizing twice weekly dialysis-converting two-star into five-star treatment?

In the developed world, maintenance hemodialysis (HD) shifted from being given two times a week with longer duration in 1960s and 1970s, to three times a week in 1980s. However, there was no clinical trial to compare outcomes before or after the switch was made. At present, in the developing world, especially India and China, a huge fraction of the dialysis population is undergoing twice a week dialysis due to cost and logistical issues (distance from dialysis center or availability of slots at dialysis center). The focus of dialysis studies has been on whether more dialysis by increasing time[1,2] or frequency,[3] or use of high flux HD membrane (HEMO study)[2] will provide better outcomes. These studies so far have shown improvement in some outcomes (anemia, phosphorus control) but not mortality benefits.

Hence, there is an urgent need for studies to assess if twice a week dialysis is adequate and whether it can be improved to provide better care to such patients. Chauhan and Medonca[4] are to be congratulated for trying to shed some light in this area with their study published in this issue. They evaluate 50 patients on twice a week dialysis and define adequate dialysis as single pool Kt/V of 2.0 per session which would provide a standardized Kt/V of 2.0 for the week. They find that a significant number of HD sessions are inadequate and then randomize the 50 patients to continue on the same treatment for 6 more months or to increased HD time to achieve a single pool Kt/V of 2.0. They found that increasing time on HD improved anemia, blood pressures, albumin, and quality of life scores.

The important conclusions that can be drawn from this study are that at present, majority of twice weekly dialysis are inadequate as 4 h treatments that provide a single pool Kt/V of >1.2 when given twice a week will provide a standardized Kt/V of ~1.4 and will be adequate only if given three times a week. Hence, measuring single pool Kt/V and adjusting treatment to achieve a single pool Kt/V of >2.0 is important.

There are a significant number of limitations of this study. First, no data are provided on what percentage of dialysis sessions were adequate in the first part of their study (only provide pooled results). The assumption would be that none of these 4 h treatments would have been adequate. Then time was increased to 320 min but data are not provided on whether this was able to achieve standardized Kt/V of >2.0 in all patients. The KDOQI guidelines for hemodialysis Adequacy and Indian Society of Nephrology guidelines on hemodialysis[5] do not recommend twice weekly HD sessions for patients with residual kidney function <2 ml/min/1.73 m^2. This is because these patients (with limited residual kidney function) will not be able to achieve standardized Kt/V >2.0 with twice weekly HD despite extended treatment times. The residual renal function was not assessed in this study.

Second, the patients had been on dialysis for at least 6 months but the average dialysis vintage is not provided. The control group had poorly managed anemia (Hgb of 8) and this did not improve over the 6 months enrollment in the study. Also, data for dosing of iron, erythropoietin, and blood pressure medications are not available. As the intervention group was being assessed weekly for their Kt/V over the 6 months, it is also possible that they also received better attention and care with regard to other aspects of their care and hence have improvements that were not related to time on dialysis.

What can be the role for twice weekly hemodialysis? Peritoneal dialysis (PD) is initiated incrementally, and residual renal function is used to determine dialysis dose needed and adjustments made as residual renal function declines. However, this is not done for HD. PD has slower declines in residual renal function compared to hemodialysis. The Frequent Hemodialysis Network trial and other studies have shown that HD done more frequently leads to faster decline in residual renal function.[6-8] It might raise the obvious question, would starting with twice a week dialysis lead to better preservation of residual renal function? The Taiwanese study[6] showed that twice a week dialysis preserved residual renal function longer than those undergoing thrice a week dialysis, and loss of residual renal function may be a potentially important contributor to poor survival in hemodialysis patient. Hence, there may be a role for incremental initiation of HD and for regular monitoring of residual renal function to adjust HD dose based on it and allow for individualization of care. Opinion is shifting even in the US toward incremental initiation though the barriers to it may be too high.[9] Results from China show that patients receiving twice a week dialysis had similar quality of life scores compared to those receiving three

times a week dialysis.[10] This may provide care that is better than in developed nations where current practice dictates initiation with three times a week dialysis. The concerns are that it may be hard to convince patients to increase time or add another day when their residual renal function declines while it is easier to set expectations at the start and place them on three times a week dialysis.

The contribution of this study is to evoke debate and discussion among the nephrologists to look at potential harms and advantages of twice a week dialysis and invite more studies for critical evaluation of twice a week dialysis. This may allow optimization of this therapy and appropriate utilization of it may convert this from two-star to five-star treatment.

A. Kher, V. Kher

Division of Nephrology and Renal Transplant Medicine, Medanta Kidney and Urology Institute, Medanta Medicity, Gurgaon, Haryana, India

Address for correspondence:
Dr. V. Kher,
Division of Nephrology and Renal Transplant Medicine, Medanta Kidney and Urology Institute, Medanta Medicity, Gurgaon - 122 001, Haryana, India.
E-mail: vijaykher51@yahoo.com

References

1. Rocco MV, Lockridge RS Jr, Beck GJ, Eggers PW, Gassman JJ, Greene T, *et al.* The effects of frequent nocturnal home hemodialysis: The frequent hemodialysis network nocturnal trial. Kidney Int 2011;80:1080-91.
2. Eknoyan G, Beck GJ, Cheung AK, Daugirdas JT, Greene T, Kusek JW, *et al.* Effect of dialysis dose and membrane flux in maintenance hemodialysis. N Engl J Med 2002;347:2010-9.
3. FHN Trial Group, Chertow GM, Levin NW, Beck GJ, Depner TA, Eggers PW, *et al.* In-center hemodialysis six times per week versus three times per week. N Engl J Med 2010;363:2287-300.
4. Chauhan R, Mendonca S. Adequacy of twice weekly hemodialysis in end stage renal disease patients at a tertiary care dialysis centre. Indian J Nephrol 2015;25:329-33.
5. Indian Society of Nephrology Guidelines for hemodialysis units. Indian J Nephrol 2012;22 Suppl:S28.
6. Lin YF, Huang JW, Wu MS, Chu TS, Lin SL, Chen YM, *et al.* Comparison of residual renal function in patients undergoing twice-weekly versus three-times-weekly haemodialysis. Nephrology (Carlton) 2009;14:59-64.
7. Daugirdas JT, Greene T, Rocco MV, Kaysen GA, Depner TA, Levin NW, *et al.* Effect of frequent hemodialysis on residual kidney function. Kidney Int 2013;83:949-58.
8. Hanson JA, Hulbert-Shearon TE, Ojo AO, Port FK, Wolfe RA, Agodoa LY, *et al.* Prescription of twice-weekly hemodialysis in the USA. Am J Nephrol 1999;19:625-33.
9. Kalantar-Zadeh K, Unruh M, Zager PG, Kovesdy CP, Bargman JM, Chen J, *et al.* Twice-weekly and incremental hemodialysis treatment for initiation of kidney replacement therapy. Am J Kidney Dis 2014;64:181-6.
10. Bieber B, Qian J, Anand S, Yan Y, Chen N, Wang M, *et al.* Two-times weekly hemodialysis in China: Frequency, associated patient and treatment characteristics and quality of life in the China dialysis outcomes and practice patterns study. Nephrol Dial Transplant 2014;29:1770-7.

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Quick Response Code:	Website: www.indianjnephrol.org
	DOI: 10.4103/0971-4065.168439

How to cite this article: Kher A, Kher V. Optimizing twice weekly dialysis-converting two-star into five-star treatment?. Indian J Nephrol 2015;25:326-7.