Reviewer's report

Title: Regression of left ventricular mass following conversion from conventional hemodialysis to thrice weekly in-centre nocturnal hemodialysis

Version: 1 Date: 4 October 2011

Reviewer: Alan Kliger

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Review of Manuscript for BioMed Central

Wald et al: Regression of left ventricular mass following conversion from conventional hemodialysis to thrice weekly in-centre nocturnal hemodialysis

This study examines retrospectively a cohort of hemodialysis patients at one center who converted from conventional to in-center nocturnal hemodialysis (INHD) over 5 3/4 years. They examine the association of dialysis modality with change in left ventricular mass as measured by echocardiography. They found a significant decline in LVM following conversion to INHD.

I have several concerns about the study design, that limit the ability to draw clear conclusions from the observations:

1. Patients who chose or were compelled to change from conventional to INHD may as a group be different than the remainder of dialysis patients, and these findings may be difficult to generalize to the dialysis population.

2. Of the 37 subjects in the primary analysis, “the majority… had preserved LVEF prior to starting INHD.” Since the effect of the intervention may depend on the initial state of the left ventricle, it would be important to know the starting and ending LVM of all subjects, and not only mean values. Were the starting LVMs or changes in LVM normally distributed, or was the mean reduction the result of a few subjects with marked reductions?

3. Echocardiograms were not systematically obtained for all subjects, but were performed “on clinical grounds.” The clinical grounds may distinguish these subjects from other HD patients, and make it difficult to generalize these findings. Were these clinical grounds acute changes such as CHF or acute MI? Why were the follow-up echocardiograms ordered once patients were on INHD?

4. The methods state that echocardiograms were recorded digitally and reported off-line by readers blinded to clinical data. Is this really true - - i.e., in the course of usual clinical care, the echocardiographers were blinded to the clinical condition of the patients? If these were re-reads of recorded echos, why was the sensitivity analysis only for 17 subjects where the authors were able to retrieve the electronic images for comparison?

5. Multiple readers performed the echocardiogram readings without a strict protocol for measuring LVM, in the course of usual clinical care. This raises the question of inter-rater reliability and reproducibility. The authors recognize this,
and attempt to deal with it by performing a sensitivity analysis. A single reader examined images of 17 subjects, and found significantly reduced LVM in this subset. Was this sub-set different than the group as a whole, i.e., might there have been systematic reasons for failure to retrieve both sets of echos?

6. We do not know the timing of the echocardiograms in relation to the dialysis procedures. Since we know that echocardiography measures not only LVM but also the water content of the heart muscle, a systematic bias could be introduced by different timing of studies in the conventional dialysis time vs. the INHD time. The authors acknowledge this problem, but state that there was a random relationship between the timing of the echos and dialysis in both arms. With no data to support this claim, a systematic bias is still possible. For example, was it easiest for INHD patients to have echos done in the mornings following their long overnight dialysis?

Some minor comments:

1. The findings of changes in LVM for the FHN Nocturnal Trial have been published since the authors prepared this manuscript, and should be included in the discussion: Rocco MV, Lockridge RS Jr, Beck GJ, Eggers PW, Gassman JJ, Greene T, Larive B, Chan CT, Chertow GM, Copland M, Hoy CD, Lindsay RM, Levin NW, Ornt DB, Pierratos A, Pipkin MF, Rajagopalan S, Stokes JB, Unruh ML, Star RA, Kliger AS and the Frequent Hemodialysis Network (FHN) Trial Group. The effects of frequent nocturnal home hemodialysis: the Frequent Hemodialysis Network Nocturnal Trial. Kidney Int. 2011 Jul 20. [Epub ahead of print]

2. Results section: serum calcium values are given without units of measure.