Reviewer's report

Title: Effects of fluid overload on heart rate variability in chronic kidney disease patients on hemodialysis

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Reviewer: Dvora Rubinger

Reviewer's report:

The study of Ferrario et al was undertaken to examine the relationship between fluid overload (FO) and abnormalities in heart rate variability (HRV), representative of the autonomic nervous system activity in chronic hemodialysis patients. HRV measurements from Holter electrocardiogram recordings and assessment of fluid overload by whole body bioimpedance were obtained in 69 chronic hemodialysis patients. HRV was assessed using time domain, frequency domain and complexity indices. The hydration indices were obtained before the dialysis sessions, while HRV determinations encompassed the whole (about 4 hr) hemodialysis duration. In patients with significant fluid overload, HRV was reduced, and there was a blunted response to ultrafiltration during the dialysis session. In five nondiabetic patients, a tendency to HRV improvement was noted on 3 month follow up after normalization of volume status.

Comments:

Patient data:
- While the study group is not very large, the patients were treated using 4 treatment modalities-see Table 1- (conventional or high flux dialysis, hemofiltration and hemodiafiltration). Each modality may affect both the response to ultrafiltration and HRV in different ways.
- The dialysis vintage was significantly longer in the FO >2.5 L group. Thus, patients from the FO<2.5 L could have maintained some residual renal function. Both the dialysis vintage and/or the residual renal function may affect HRV.
- Which percentage of patients had left ventricular systolic or diastolic dysfunction?

Table 2 and 3:
- Correlation coefficients with the initial hydration status during the first and last 30 min and the entire hemodialysis duration were performed with 8 HRV indices; in Table 3, however, data of only 4 indices are given. LF% and LF/HF values should be included in the table.
- Dynamics changes in HRV are better assessed over shorter period of times (for instance, 15-20 min instead of 30 min periods).
- It is difficult to assess from Tables the effect of dialysis on HRV on both groups. Table 2 should include also data of the last 30 min of hemodialysis treatment.

Tables 4-5 and Figure 4:
The patient sample is too small to reach any conclusion.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.