

ECHOCARDIOGRAPHIC EFFECTS OF STANDARD AND INDIVIDUALIZED DIALYSATE SODIUM ON CHRONIC HEMODIALYSIS PATIENTS

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Objectives:

Cardiovascular disease is a most common complication and chief cause of death in hemodialysis patients mainly due to volume and salt overload. This study assessed the effects of individualized dialysis sodium prescription on changes of echocardiography in hemodialysis (HD) patients.

Methods:

Forty three patients with end stage renal failure on chronic hemodialysis were studied (22 females, 21 males) with a mean age 65.90 +/- 11.47 (35-86) years. The mean time on HD was 76.42 +/- 67.71 (18-373) months. In the first phase all patients underwent dialysis with standard dialysate sodium of 138 mmol/L followed by the second phase (which last one year) where in all patients were performed dialysis with individualized dialysate sodium concentration according to average pre HD serum sodium concentration measured during one year. In all patients echocardiography was performed at the end of first and beginning of second phase. Left atrium (LA), left ventricle systolic diameter (LVSD), left ventricle diastolic diameter (LVDD), interventricular septum, left ventricle mass (LVM), left ventricle mass index (LVMI), relative wall thickness (RWT) and ejection fraction (EF) were measured.

Results:

In terms of echocardiographic parameters: LVSD, IVS, LVM and LVMI were statistically decreased after individualized sodium dialysate treatments ($p = 0.002$, $p = 0.003$, $p = 0.000$, $p = 0.000$ respectively). When we divided patients into two groups, first one, dialysate sodium 134-136 mmol/l and second one 137-138 mmol/l, LVM and LVMI remain statistically significant in both groups ($p = 0.011$, $p = 0.011$; $p = 0.004$, $p = 0.003$, respectively), but LVSD was statistically significant decreased in group with dialysate sodium 136-138 mmol/l. LA, LVDD, RWT, EF did not statistically changed. In both groups patients had lower predialysis systolic (SBP) and diastolic blood pressure (DBP) and interdialytic weight gain (IDWG) compared with standard dialysate sodium (SBP 146,44 vs 136,84, $p=0,000$, DBP 84,35 vs 80,12, $p=0,000$; IDWG 2,39 vs 2,20, $p=0,048$; SBP 131,4 vs 126,31, $p=0,018$, DBP 78,38 vs 75,20, $p=0,015$, IDWG 2,06 vs 1,91 $p= 0,042$ according).

Conclusions:

A reduction of the dialysate sodium concentration based on the pre HD serum sodium level of the patient reduce SBP, DBP and IDWG and decrease the volume overload on the heart and consequential heart hypertrophy assessed by echocardiography. Better results are achieved if the patients perform dialysis with dialysate sodium from 137-138, and we recommend not always to prescribe low dialysate sodium concentration, especially in patient with low serum sodium concentration.

