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Influence of intensified Haemodialysis on Fibroblast Growth Factor 23 (FGF23) and Left Ventricular Hypertrophy (LVH), a comparison of nocturnal and standard dialysis

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Background

Elevated levels of FGF23 and LVH are surrogate parameters of cardiovascular mortality in patients with end stage renal disease (ESRD). Aim of this study was, to investigate if LVH and FGF23 are affected by dialysis modality, especially long nocturnal dialysis.

Hypothesis

We hypothesized that patients on long nocturnal HD (LNHD) would show lower levels of FGF23 and less LVH compared to patients receiving standard HD (SHD).

Methods

The prospective study design included 69 maintenance HD patients of the same dialysis centre, 25 treated with LNHD and 44 on SHD, matched for age, gender, dialysis vintage.

Patients were studied twice: At study entry (A) and after one year of follow-up (B).

At both time points, blood was drawn during dialysis, centrifuged and serum frozen until analysis. FGF23 was measured using a second generation C-terminal ELISA (Immutopics). LV-Mass was calculated based on echocardiographic examination.

Results

There were 20 drop outs for the one year follow up. No significant differences were found regarding age, gender, renal underlying disease and specific comorbidities.

Parameter	SHD	LNHD	p-value
Age (years ± SD)	44 ± 9	41 ± 12	0.323
Gender (%male)	63.6	68	0.796
% Diabetes mellitus	15.9	0	0.291
Syst. blood pressure (mmHg)	139 ± 19	133 ± 23	0.261

As expected LNHD showed significant higher levels of Kt/V (2,12 vs 1,47, $p < 0.001$) and volume withdrawal (3.4 l vs. 2.8 l; $p = 0.005$). Furthermore we found significantly higher levels of creatinine, urea and potassium, as well as lower levels of phosphate in the nocturnal HD group. FGF23 was notable influenced by phosphate and specific medications.

logFGF23 (3,32 RU/ml and 3,26 RU/ml (one year follow up) in LNHD vs. 3,46 RU/ml and 3,45 RU/ml (one year follow up) in SHD) and logLV-Mass(2,30 g and 2,23 g (one year follow up) in LNHD vs. 2,30 g and 2,32 g (one year follow up) in SHD) did not differ significantly between dialysis modalities (figure 1 &2). There was no correlation between FGF23 and LV-Mass.

Figure 1

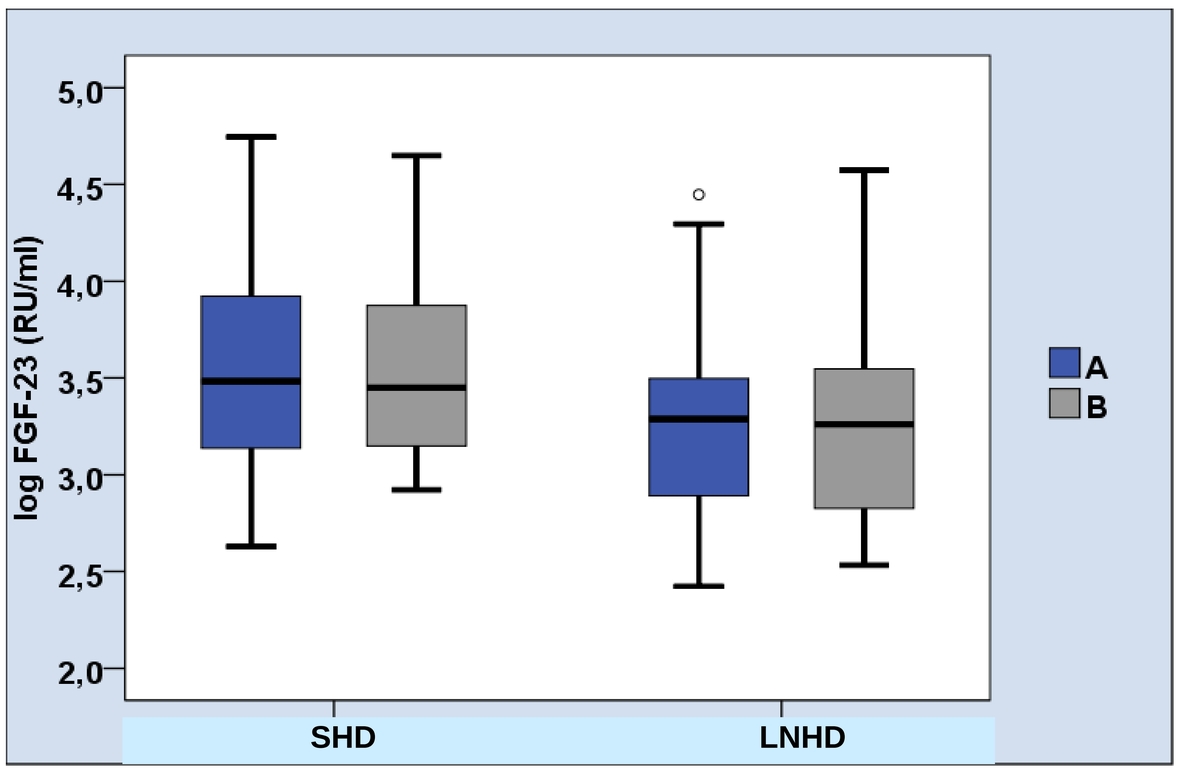

Figure 1: logFGF23 in comparison of day and night dialysis
A = Time of first measurement, B = One year follow up

Figure 2

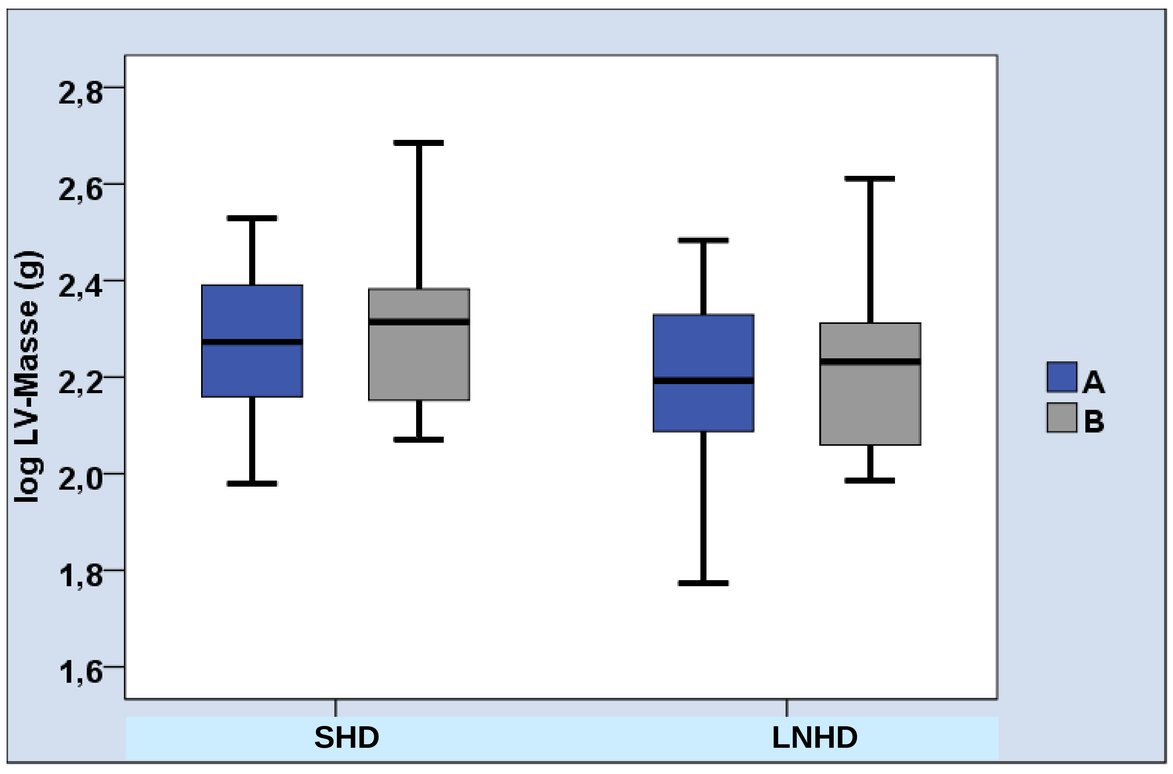

Figure 2: logLV-Mass in comparison of day and night dialysis
A = Time of first measurement, B = One year follow up

Conclusion

We could not verify our hypothesis but found a trend towards lower FGF23 in this small cohort of LNHD. Further studies with lager cohorts are needed to clarify this observation.

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