

# ECCENTRIC LEFT VENTRICULAR HYPERTROPHY IS A MAJOR RISK FACTOR FOR SUDDEN DEATH IN PATIENTS WITH END-STAGE KIDNEY DISEASE

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## Background

Cardiovascular (CV) disease is a major cause of death in patients with ESKD. LVH is a known risk factor for CV events and can be divided in two types: concentric and eccentric. Although there is considerable overlap, the first has clinically been linked to diastolic heart failure and the second to systolic heart failure. In non-renal patients especially eccentric LVH has been related to an inferior clinical outcome.

## Objective

To compare the occurrence of all-cause mortality and sudden death between concentric and eccentric LVH in patients with ESKD.

## Methods

This study was performed in participants of CONTRAST, a cohort of ESKD patients, who

underwent transthoracic echocardiography (TTE). LVH was calculated as LVM/height<sup>2.7</sup> and defined >44g/m<sup>2.7</sup> for women and >48g/m<sup>2.7</sup> for men. Relative wall thickness (RWT) was calculated from posterior wall thickness (PWT) and left ventricular end-diastolic diameter (LVEDD) by the formula  $RWT = (2 * PWT) / LVEDD$ .

Table 1: baseline characteristics

Characteristic	Entire cohort (n=714)	Analyzed patients (n=328)
Age (yrs)	64.1 (13.7)	63.1 (13.3)
Gender (male)	445 (62.3%)	201 (61.3%)
BMI (kg/m <sup>2</sup> )	25.4 (4.8)	25.4 (4.9)
RKF (>100mL/24h)	376 (52.7%)	171 (52.1%)
Dialysis vintage (yrs)	2.0 (1.0-4.0)	2.0 (1.0-4.0)
Kt/V	1.40 (0.22)	1.39 (0.20)
Albumin (g/L)	40.4 (3.8)	40.6 (4.0)
PTH (pmol/L)	20 (10-35)	32 (12-41)

Data are shown as mean (sd), median (IQR) or number (%)

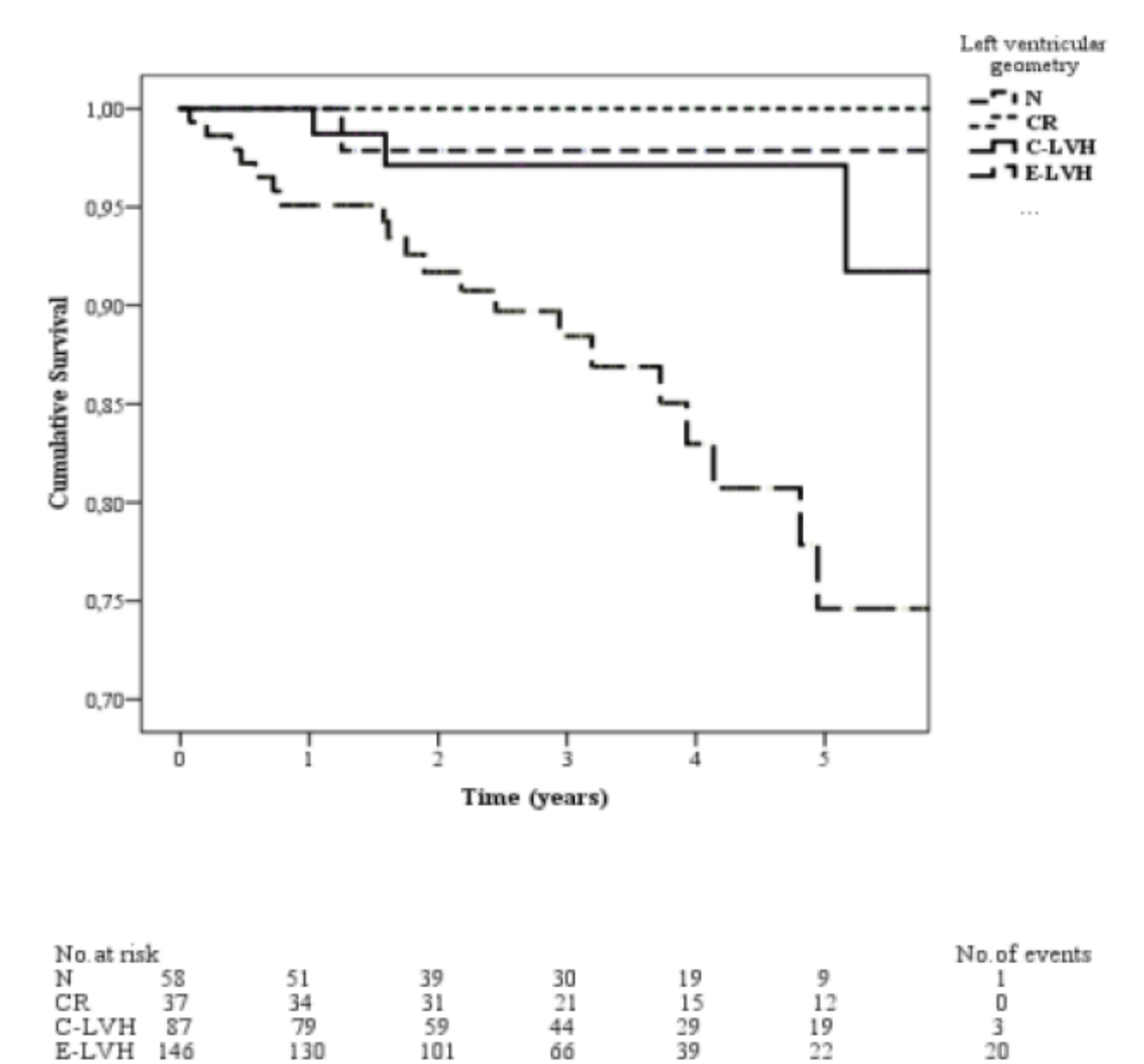
RWT ≤0.42 was considered eccentric and >0.42 concentric LVH. Cox proportional hazards models, corrected for a propensity score (PS) consisting of potential confounders, were used to calculate hazard ratios (HRs) between concentric and eccentric LVH.

## Results

Baseline TTE was performed in a representative sample of 328 CONTRAST patients (table 1). LV geometric patterns are shown in figure 1. A total of 131 patients died. PS corrected HR of all-cause mortality in patients with eccentric

LVH versus concentric LVH was 0.92 (95%CI 0.60-1.41; *p*=0.92) and sudden death 3.70 (95%CI 1.07-12.79; *p*=0.04; figure 2).

Fig 2: Survival curves for sudden death

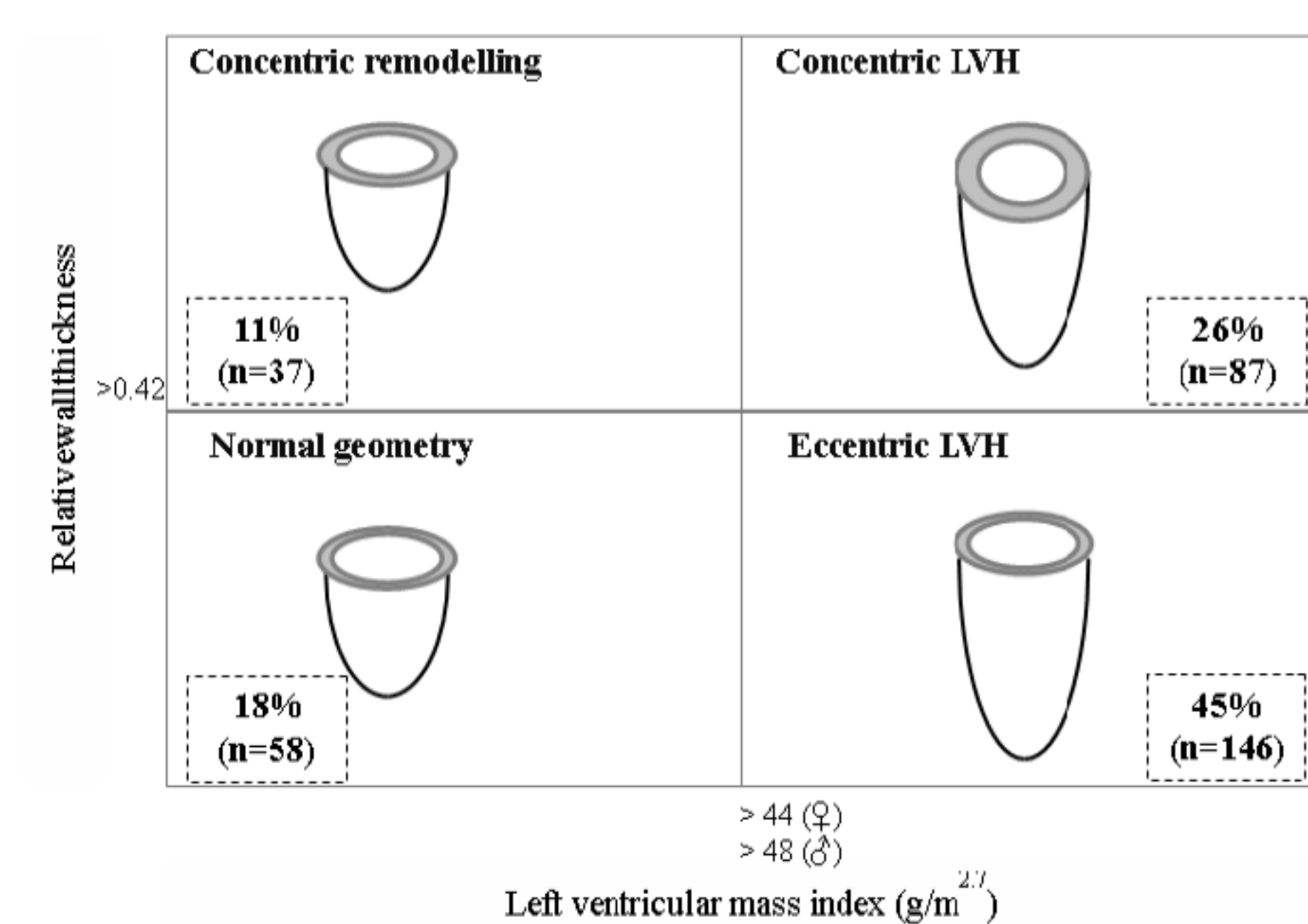


Normal geometry (N); concentric remodelling (CR); concentric left ventricular hypertrophy (C-LVH) and eccentric left ventricular hypertrophy (E-LVH)

## Conclusions

The incidence of sudden death is significantly higher in patients with eccentric than concentric LVH. As eccentric LVH results particularly from fluid overload in patients with ESKD, these data suggest that strict fluid control may reduce mortality. Furthermore, as especially eccentric LVH is associated with serious cardiac arrhythmias, this patient group in particular may benefit from an implantable cardioverter defibrillator (ICD).

Fig 1: Distribution of left ventricular geometric patterns



**Financial Support:** Dutch Kidney Foundation, Fresenius Medical Care Netherlands, Gambro Renal Products,

Dr.E.E. Twiss Fund, Baxter Extramural Grant Program, Roche Pharmaceuticals, ZonMW (the Netherlands organisation for health research and development)

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