

# The impact of glomerular filtration rate in heart failure patients with cardiac implantable devices

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## INTRODUCTION

- ✓ Cardiovascular Implantable Electronic Devices (CIED) in heart failure patients **improve quality of life** and **reduce mortality** in selected patients.
- ✓ According to KDIGO consensus, cardiac resynchronization therapy (CRT) or implantable cardiac defibrillator (ICD) benefit is only lost below stage 4 CKD.
- ✓ However, little is known about the prognostic impact of glomerular filtration rate (GFR) across other stages of CKD of HF patients submitted to CIED.

**Purpose:** to evaluate the impact of CKD in all-cause mortality in HF patients submitted to CIED

## METHODS

- ✓ Prospective single-center study
  - implanted CDT/ICD between 2015-2019
  - CKD defined according GFR by KDIGO classification
- ✓ Clinical characteristics were evaluated at baseline and mortality was assessed using the national registry.

### Statistical analysis:

- Univariate and multivariate analysis were used to compare clinical characteristics of pts who died and who survived using the Cox regression and Kaplan-Meier methods.
- The best GFR cut-off value for mortality was obtained using the area under the ROC curve (AUC) method.

## RESULTS

2015→2019

- ✓ 974 devices (414 ICDs + 560 CRTs)
- ✓ Follow up: 26.4±16.5 months
- ✓ 23.3% females; median age: 67.6±12.1Y

16.5% died

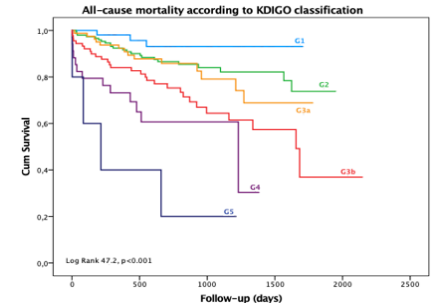
- ✓ GFR at time of implant was significantly lower in pts who died (49.7 vs 67.3 ml/min/1.73m<sup>2</sup>, p<0.001)

### GFR at the time of device implant

Independent predictor of mortality (adjusted for age, gender, arterial hypertension and diabetes) HR:1.12;95%CI 1.04-1.16,p<0.001

Death risk significantly increased with GFR<90ml/min/1.73m2

CKD KDIGO class	Death risk
CKD Stage 3a	↑ 2.7-fold HR:2.7;95%CI 1.15-6.52,p=0.02
CKD Stage 3b	↑ 5.5-fold HR:5.51;95%CI2.45-12.4,p<0.001
CKD Stage 4	↑ 9.5-fold HR:9.54;95%CI 3.95-23.06,p<0.001
CKD Stage 5	↑ 14.7-fold HR:14.74;95%CI 4.94-43.99,p<0.001



**Best GFR cut-off value to predict mortality:** 75ml/min/1.73m2  
AUC:0.70; 69% sensitivity; 65% specificity

## CONCLUSION

- **GFR was an independent predictor for all-cause mortality in patients submitted to CIED**, with the increased risk of death starting in stage 3a and reaching a dramatic 14.7-fold higher risk of death for stage 5 pts.
- We hypothesized that CKD should not postpone CIED implant and that renal function should be optimized before implant to prevent increased mortality.