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BACKGROUND:

Cardiac resynchronization therapy (CRT) response is strongly associated with clinical outcomes and long-term prognosis in Heart Failure (HF) patients. In CRT non-responder patients, studies on criteria related to clinical outcomes are lacking.

PURPOSE:

We ought to compare CRT responders and non-responder defined by echocardiographic criteria and to access the impact of clinical criteria in the non-responder patients.

METHODS:

We retrospectively enrolled 83 consecutive HF patients with implantable CRT (mean age 70,7 ± 10,8 years; males 66,3%; mean follow-up of 63,39 ± 94,97 months). Echocardiographic response was defined as an increase in left ventricular ejection fraction (LVEF) ≥ 15% and clinical response as improvement in New York Heart Association functional class (NYHA) ≥ 1, both 6 months after CRT implantation. Patients were evaluated through echocardiographic and clinical parameters and divided into CRT echocardiographic non-responders (Group 1) and CRT echocardiographic responders (Group 2).

RESULTS:

Table 1 - Baseline characteristics and outcomes

Baseline	All patients (n=83)
CRT-D ¹ , n (%)	70 (84,3)
Medium LVEF ² , mean ± SD	30,38 ± 7,69
NYHA III-IV, n (%)	22 (26,5)
Ischemic, n (%)	30 (36,1)
HF ³ hospitalizations and related admissions to ED ⁴ , n (%)	16 (19,3)
Composite outcome ⁵ , n (%)	26 (31,3)
Death by all causes, n (%)	10 (12,0)
Sudden cardiac death, n (%)	2 (2,4)
Non-sudden cardiovascular death, n (%)	5 (6,0)

CRT-D¹: cardiac resynchronization defibrillator; LVEF²: left ventricular ejection fraction; HF³: heart failure; ED⁴: emergency department; Composite outcome⁵: HF hospitalizations, HF related admissions to the ED and death by all causes.

Table 2 – Comparison of clinical characteristics and outcomes

	Non-responders (Group 1, n=44)	Responders (Group 2, n=39)	P-value
Age, mean ± SD	70,91 ± 11,15	70,74 ± 11,29	ns
Male, n (%)	30 (68)	23 (59)	ns
Previous LVEF ¹ , mean ± SD	31,49 ± 6,61	28,26 ± 9,68	ns
Dyslipidemia, n (%)	33 (75)	11 (28)	0,033
Obstructive sleep apnea, n (%)	5 (11)	1 (3)	0,044
Ischemic aetiology, n (%)	18 (41)	25 (69)	ns
Composite outcome ² , mean ± SD	1,83 ± 3,28	0,37 ± 0,68	0,010

LVEF¹: left ventricular ejection fraction; Composite outcome²: HF hospitalizations, HF related admissions to the ED and death by all causes.

Table 3 – Variables relatable to composite outcome

Variables	Hazard ratio	P-value	95% Confidence interval
Absence of NYHA ¹ improvement	3,23	0,045	0,839 – 12,445

Variables	P-value
Worst NYHA ¹ after CRT ²	0,013

NYHA¹: New York Heart Association functional class ; CRT²: cardiac resynchronization therapy.

CONCLUSION:

Although echocardiographic CRT non-responders had worse outcome, the achievement of positive clinical criteria response, may be associated with better prognosis.