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BACKGROUND:

Cardiac resynchronization therapy (CRT) response definition varies widely between studies and there is no consensus in which definition best correlates with clinical outcomes.

PURPOSE:

To determine which echocardiographic or clinical definition of response to CRT best correlates with clinical outcomes and to determine the relation between these definitions.

METHODS:

A single center, retrospective cohort study with 83 consecutive HF patients with implantable CRT, observed from 2019 to 2020 (median age 70,7 ± 10,8 years; males 66,3%; mean follow-up of 63,39 ± 94,97 months). Clinical evaluations were used. Echocardiographic response was defined as increase in left ventricular ejection fraction (LVEF) ≥ 10% and clinical response as reduction in New York Heart Association functional class (NYHA) ≥ 1, both 3 to 6 months after CRT implantation.

RESULTS:

Table 1 - Baseline characteristics and outcomes

Baseline	All patients (n=83)
CRT-D ¹ , n (%)	70 (84,3)
Mean initial LVEF ² , mean ± SD	30,38 ± 7,69 %
Mean LVEF ² after CRT ³ , mean ± SD	39,26 ± 11,74%
Mean difference of LVEF ²	8,81 ± 10,51%
Aetiology, n (%)	
• Idiopathic	37 (44,6)
• Ischemic	30 (36,1)
• Alcoholic cardiomyopathy	9 (10,8)
HF ⁴ hospitalizations and admissions to ED ⁵ , n (%)	16 (19,3)
Composite outcome ⁶ , n (%)	26 (31,3)
Echocardiographic responders, n (%)	49 (59,0)
Clinical responders, n (%)	33 (39,8)

ECOCARDIOGRAPHIC CRITERIA

Table 2 – Echocardiographic criteria and outcomes

Echocardiographic criteria	Responders	Non-responders	P
HF ² hospitalizations and admissions to ED ⁵ , n (%)	2 (4,1)	5 (14,7)	0,011
Composite outcome ⁶ , n (%)	8 (16,3)	12 (35,3)	0,007

Table 3 – Correlation between absence of LVEF improvement and outcomes

Outcome	Pearson's correlation coefficient (r)	P
HF ² hospitalizations and admissions to ED ⁵	0,331	0,010
Composite outcome	0,314	0,014

CLINICAL CRITERIA

Table 4 – Clinical criteria and outcomes

Clinical criteria	Responders	Non-responders	P
HF ² hospitalizations and admissions to ED ⁵ , n (%)	5 (15,2)	14 (28,0)	0,034
Composite outcome ⁶ , n (%)	9 (27,3)	20 (40,0)	ns

Table 5 – Correlation between improvement in NYHA and outcomes

Outcome	Pearson's correlation coefficient (r)	P
Composite outcome ⁶	0,241	0,041

Table 6 – Correlation between LVEF improvement and change in NYHA

Variables	Pearson's correlation coefficient (r)	P
LVEF ² improvement and change in NYHA ⁷	0,411	0,0001

CRT-D¹: cardiac resynchronization defibrillator; LVEF²: left ventricular ejection fraction; CRT³: Cardiac resynchronization therapy; HF⁴: heart failure; ED⁵: emergency department; Composite outcome⁶: HF hospitalizations, HF related admissions to the ED and death by all causes; NYHA⁷: New York Heart Association functional class

CONCLUSIONS:

Echocardiographic and clinical criteria concordance is not optimal. Echocardiographic criteria best correlates with clinical outcome however, no criteria for CRT response was accurate in predicting clinical outcomes and more definitions and studies of CRT responders are required.