Outcomes and predictors of clinical response after upgrade to resynchronization therapy

Brandao M.; Goncalves Almeida J.; Fonseca P.; Rosas F.; Santos E.; Ribeiro J.; Oliveira M.; Goncalves H.; Fontes-Carvalho R.; Primo J.

Hospital Center of Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal

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BACKGROUND: Upgrade to resynchronization therapy (CRT) is common practice in Europe. However, patient selection remains a challenge. Data regarding predictors of response to upgrade is currently lacking.

AIM: To identify predictors of clinical response after upgrade to CRT.

METHODS: Single-center retrospective study of consecutive patients submitted to upgrade to CRT (2007-2018). Patients underwent clinical and echocardiographic (echo) evaluation at baseline, 6-months and 1-year. Major adverse cardiac events (MACE) included hospitalization for heart failure (HF) or all-cause mortality. Clinical response was defined as New York Heart Association (NYHA) class improvement without MACE in the 1st year of follow-up (FU). Left ventricle end-systolic volume reduction of >15% designated echo response. Multivariate logistic regression was performed to identify predictors of clinical response to CRT.

RESULTS: Fifty-six patients submitted to upgrade to CRT (80.4% male, mean age 70.0 ± 9.6 years) were included; 43 patients (78.2%) previously had a pacemaker and 12 (21.8%) had a defibrillator device. Most patients had non-ischemic HF (67.9%), with a mean baseline left ventricle (LV) ejection fraction of 27.9 ± 6.4%. Indications for upgrade were mainly pacemaker dependency or pacing-induced LV dysfunction (76.6%) and de novo left bundle branch block (23.4%).

Thirty-one (59.3%) patients were clinical responders. MACE occurred in 37.5% of patients; 28.6% were hospitalized for HF and 13% died during the 1st year of FU. Clinical responders had a lower rate of atrial fibrillation (AF) (46.9% vs. 53.1%, p=.025) and a higher rate of pacemaker rythm prior to upgrade (80.6% vs 47.6%, p=.013). Among responders, the previous device was more frequently a pacemaker (87.5% vs 61.9%, p=.029), and the new device a CRT-P (81.2% vs 54.5%, p=.035). HF etiology did not differ between responders and non-responders.

Multivariate analysis identified absence of AF (odds ratio [OR] 4.4, 95% confidence interval [CI] 1.1-17.6, p=.037), CRT-P (OR 5.7, 95% CI 1.3-25.8, p=.022) and quadripolar lead implant (OR 3.8, 95% CI 1.3-25.8, p=.024) as predictors of clinical response in upgraded patients.

CONCLUSIONS: In this cohort, absence of AF, implantation of CRT-P and use of a quadripolar lead predicted clinical response to upgrade to CRT. Larger studies are warranted to tailor selection of patients for upgrade procedures.

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