Device Therapy - Cardiac Resynchronisation Therapy (CRT)

Clinical outcomes after upgrade to resynchronization therapy: a propensity-score matched comparative analysis

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, guideline recommendations are discordant and randomized trials are lacking. Previous studies have shown worse outcomes in upgraded patients.

AIM: To compare clinical outcomes in a cohort of patients receiving de novo or upgrade to CRT.

METHODS: Single-center retrospective study of consecutive patients submitted to CRT implantation (2007-2018). Major adverse cardiac events (MACE) included heart failure hospitalization or all-cause mortality. Clinical response was defined as NYHA class improvement without MACE in the 1st year of follow-up (FU). Left ventricle end-systolic volume reduction of >15% designated echocardiographic (echo) response. Survival analysis with Kaplan-Meier method and Log-rank test was performed. Propensity-score matching (PSM) analysis was performed to adjust for possible confounder variables.

RESULTS: 295 CRT patients (70.5% male, mean age 67 ± 11 years, 72.5% non-ischemic cardiomyopathy, 54.6% implanted with CRT-D) were included. Fifty-six patients (19%) underwent an upgrade: 43 (78.2%) from a pacemaker and 12 (21.8%) from a defibrillator device. Indications for upgrade were mainly pacemaker dependency or pacing-induced LV dysfunction (76.6%) and de novo left bundle branch block (23.4%).

Upgraded patients were older (70 vs 66 years, p=.034), with larger baseline QRS (185 ± 25 vs 163 ± 30 ms, p<.001) and higher rates of atrial fibrillation (58.2% vs 26.7%, p<.001), coronary artery disease (41.8% vs 26.2%, p=.033), moderate to severe valve disease (42.9% vs 22.6%, p=.003) and chronic kidney disease (36.4% vs 18.7%, p=.008). Upgraded patients more frequently received CRT-P (71.4% vs 39.3%, p<.001). CRT-D were more often implanted for secondary prevention (53.3% vs 20.2%, p=.011) in the upgrade group. There were no differences in procedural complications, clinical (59.3 vs 62.6%, p=.765) or echo (72.2% vs 71.9%, p=.970) response rates. During a median FU of 3 ± 5 years, all-cause mortality was similar among groups (Log-rank test, p=.688). MACE occurred more frequently in the upgrade group (Log-rank test, p=.025). No differences emerged in lead complications (8.9% vs 8.4%, p=.892) or device infection (1.8% vs 2.9%, p=.986).

PSM analysis identified 106 matched pairs (56 upgrade/50 de novo patients), without baseline statistical differences. All-cause mortality (Log-rank test, p=.555) and MACE (Log-rank test, p=.574) were comparable between groups.

CONCLUSION: In this cohort, upgrade to CRT was comparable to de novo implantation in terms of clinical and echo response. Moreover, upgrade to CRT was not associated with higher complication rates. All-cause mortality and MACE were similar between groups.