

Early Cardiac Resynchronization Therapy (CRT) improves the outcome in Heart Failure (HF) patients with Left Bundle Branch Block (LBBB)

Un precoce trattamento di resincronizzazione cardiaca (CRT) migliora la prognosi in pazienti con scompenso cardiaco e blocco di branca sinistro

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Dear Editor,

an accurate selection of the patients and a right instituting CRT timing are critical to get the most favourable outcome. For these reasons we greatly appreciated the paper by Penn and associates entitled "Improved outcome with preventive cardiac resynchronization therapy in the elderly: a MADIT-CRT substudy" recently appeared on the Journal of Cardiovascular Electrophysiology [1].

This paper in fact adds additional evidence to our previous works [2, 6] stating that CRT should be performed when left ventricular enlargement and remodeling are not severe. At this regard, using indexed data (i.e. ventricular volume data/body surface area expressed as ml/square meter) we found out that CRT was effective only in patients with an indexed left ventricular end-diastolic volume (iLVEDV < 142 ml/m²) at pre-CRT gated Single Photon Emission Computed Tomography (gSPECT). In patients with indexed left ventricular dimensions below this threshold CRT usually produces a significant (i.e. ≥ 0.05) LVEF increase. The increase of LVEF ≥ 0.05 was used to as a threshold to classify responders and non responders. In our series, responders showed a mean baseline LVEF (0.24 \pm 0.08) significantly higher than non responders (0.20 \pm 0.07). At pre-CRT study responders showed mean indexed end-systolic volumes (iESV) and indexed end-diastolic volumes (iEDV) significantly smaller than non responders. In fact in our series pre-CRT iESV resulted 97 \pm 37 ml/m² in responders vs 158 \pm 44 ml/m² in non responders and pre-CRT iEDV was 126 \pm 38 ml/m² in responders vs 196 \pm 43 ml/m² in non responders. In responders CRT produced a significant reduction of both iESV and iEDV that pas-

sed from 97 \pm 37 ml/m² and 126 \pm 38 ml/m² to 61 \pm 34 ml/m² and 93 \pm 37 ml/m² respectively, but did not significantly reduced nor iESV neither iEDV in non responders that passed from 158 \pm 44 ml/m² and 196 \pm 43 ml/m² to 152 \pm 45 ml/m² and to 184 \pm 44 ml/m² respectively [3].

In responders the favourable effects of CRT are obtained within 2 months and are stable at least over a period of 6 months [8], but, possibly far longer. Consequently the determinants of CRT outcome are also the determinants of a further clinical course. In subjects with moderate left ventricular enlargement (iEDV < 142 ml/m²) and with LVEF not significantly lower than 0.24 CRT not only improves left ventricular performance [2, 3] but also preserves in time the obtained functional improvement [8]. In subjects with a severe left ventricular dysfunction (LVEF \leq 0.20 and iEDV > 142 ml/m²) no significant functional improvements are obtained by CRT with consequent poor prognosis [6].

In our series all the patients that developed hard events (death or acute heart failure requiring hospitalization) over a two year follow-up had a pre-CRT LVEF no higher than 0.21 with no significant changes after CRT. In a three year survival study [6] on a relatively small series of patients (mean age 74 years) we observed that the subjects died for a worsening heart failure, had pre-CRT iESV volumes > 194 ml/m².

A very important left ventricular enlargement probably accounts for the nearly 30% of patients that do not take advantage from CRT [1, 7]. In the consideration that CRT is usually effective only in subjects with a moderate left ventricular enlargement and without an extremely depressed LVEF, we

have suggested, since 2005, an early use of CRT in HF patients with LBBB [2, 5].

In conclusion: the effectiveness of CRT decreases with volume overload [8]. As we previously reported [8], this observation fully matches with the outcome of other cardiovascular interventions like coronary revascularization and valvular disease in which the benefit of the procedure is limited by the degree of volume overload [9, 10].

CRT must consequently be performed before the progressive increase in left ventricular dimensions compromise the effectiveness of the CRT itself, as also recently confirmed by Penn and associated [1].

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