Selection of the Best of 2016 on Cardiac Pacing

Selección de lo mejor del año 2016 en terapia de resincronización cardiaca

To the Editor,

The present scientific letter revisits the main novel publications in cardiac resynchronization therapy (CRT) of the last year, focusing on the most relevant topics or those considered to have the greatest clinical and scientific impact.

Undoubtedly, one of the CRT topics to most capture the interest of clinical researchers is multipoint pacing (MPP).[1] Fundamentally, this type of pacing is likely to be beneficial because patients with complete left bundle-branch block of the bundle of His show a heterogeneous left ventricular (LV) activation pattern. This pattern is affected by various factors, such as the presence of scar tissue or functional conduction block. Multipoint pacing should be able to achieve quicker and more uniform LV activation via simultaneous pacing of various remote sites.

In the last year, several articles have described the beneficial effects of MPP on acute hemodynamic parameters. Osca et al.[1] compared the effects of MPP and conventional pacing on acute hemodynamics, cardiac contractility, and echocardiographic dyssynchrony parameters. Among the 27 included patients, there was a nonsignificant tendency for a greater increase in the cardiac index in patients with MPP vs conventional pacing (34.7% $\pm$ 5.1% vs 21.8% $\pm$ 5.4%; P = .19). However, the most interesting result was that the percentage of acute responders, defined by a cardiac index increase $\geq$ 10%, was significantly higher with MPP (85.2% vs 62.9% with conventional pacing; $P < .001$). In addition, the dyssynchrony LV parameters evaluated using radial strain improved to a greater extent in the MPP group.

The last year has also seen the publication of the first studies providing data on the mid-to-long–term clinical efficacy of MPP. In the study by Pappone et al.,[2] 44 patients were randomized to receive CRT with conventional biventricular pacing or with MPP. At 12 months, the proportion of responders was comparable between the 2 groups, although there was a nonsignificantly higher percentage of responders in the MPP group (76% vs 57%; P = .33). However, the relative increases in LV end-systolic volume (ESV) and functional class (FC) were significantly greater in the MPP group (ESV: median, –25% [–39% to –20%] vs –18% [–25% to –2%]; P = .03; CF: median, +15% [8% to 20%] vs +5% [–1% to 8%]; P = .001).

Another notable contribution is the recent publication of the preliminary results of the Italian MPP registry IRON-MPP.[3] This registry reported the experience of 76 Italian centers with 507 patients who received MPP between August 2013 and May 2015. The study describes the standard clinical practice for the treatment of patients with CRT with MPP in these centers and provides 6-month follow-up data on LV ejection fraction (LVEF) and clinical response in 232 patients (94 with active MPP and 138 with conventional biventricular pacing). Despite the limitations inherent to registries, the results are interesting, because the 6-month LVEF was significantly higher in patients with MPP (39.1% $\pm$ 9.6% vs 34.7% $\pm$ 7.6%; $P < .001$). In addition, an increase in the clinical composite score used in this registry was more frequently seen in patients with MPP (56% vs 38%; P = .009).

Finally, in a nonrandomized study, Zanon et al.[4] compared 3 different strategies to improve the CRT response rate: *a)* conventional biventricular pacing (n = 54); *b)* biventricular pacing but with hemodynamic and electrical optimization of the LV pacing site (n = 36); and *c)* a combination of the optimization used in group 2 and MPP (n = 20). At 12 months, patients treated with MPP showed both a larger reduction in the LV ESV and a greater improvement in the FC.

Another notable topic is the influence of the right ventricular (RV) lead position in patients undergoing CRT. For example, the randomized SEPTAL CRT trial[5] evaluated whether clinical CRT outcomes are influenced by placement of the RV lead in the apex or in the septal zone. The study showed that a septal position of the RV lead is not inferior to its classic position in the RV apex.

Finally, the possible ability of imaging techniques to guide LV lead placement is another of the most relevant topics in CRT. Placement of the LV lead in the region with the greatest electrical activation delay can improve the CRT response rate. Sommer et al.[6] have published results from a randomized study comparing clinical outcomes after LV lead placement using various imaging techniques (cardiac computed tomography venography of the coronary sinus, ^{99m}technetium myocardial perfusion imaging, and speckle-tracking echocardiography) vs routine lead implantation, with 89 patients in the first group and 93 patients in the second. The primary study endpoint (death, heart failure hospitalization, no improvement in FC, and 6-minute walk distance) occurred less frequently in patients randomized to image-guided lead placement (26% vs 42%; P = .02).

In conclusion, during the last year, the main developments in CRT are the publication of evidence on the ability of MPP to improve acute hemodynamics and the first data on the mid-to-long–term clinical benefits of MPP. In addition, a randomized study has shown the possible usefulness of imaging techniques in guiding LV lead placement.

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