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FOURIER ANALYSIS-DERIVED PARAMETERS IN CARDIAC RESYNCHRONIZATION THERAPY FOR CONGESTIVE HEART FAILURE: A 8-YEAR FOLLOW UP

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BACKGROUND-AIM

Congestive heart failure (CHF) patients (p) with QRS > 120 ms and EF < 35% are usually referred for cardiac resynchronization therapy (CRT). Unfortunately, the results of imaging techniques to improve the percentage of responders have been quite disappointing, showing a very poor inter- and intraobserver reproducibility.

The aim of our study was to assess the value of Fourier analysis-derived radionuclide angiography indices (RNA) in predicting survival of p undergoing CRT.

METHODS

From 2006 and 2008 we studied 52 p undergoing CRT with CHF (50% CAD) and optimal medical therapy. Clinical, echocardiographic and RNA evaluation was performed at baseline in all patients, whereas 16 patients underwent pre- and post implantation RNA evaluation. RNA Fourier analysis –derived phase angle and amplitude quantify regional contraction timing and magnitude and allow computation of phase angle standard deviation (SD), synchrony (S) and entropy (E) as already described by O'Connell et al.

RESULTS

Mean SD was 52 ± 16 pre-CRT and 36 ± 21 post-CRT. S and E were 0.91 ± 0.08 and 0.59 ± 0.11 pre-CRT, and 0.93 ± 0.06 and 0.56 ± 0.12 post-CRT, respectively.

All p were alive after 5 years, and 11 after 8 years of follow-up with: with an overall survival (OS) of 69%.

6 months after CRT we were able to identify two groups (A, 8 p; B, 8 p) depending on the variation of the RNA parameters. In group A the combined improvement of SD, S and E depicted the amelioration of contraction synchrony. In group B no improvement was observed.

In group A a better OS was noted (63%) with respect to group B (50%). Moreover, in group A a higher percent variation of dyssynchrony parameters was observed (\otimes SD \approx -250%; \otimes E \approx -40%; \otimes S \approx 10%).

CONCLUSION

Fourier analysis derived parameters may be reliable in identifying mechanical dyssynchrony in patients with CHF and the improvement of SD, S and E throughout follow-up may be associated with a better OS. A larger patient population is needed to confirm these attractive preliminary results.