

Optimal percentage of biventricular pacing to obtain CRT response: how high is high enough

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Background: The greatest benefit with cardiac resynchronization therapy (CRT) is achieved when biventricular pacing (BivP) percentage (%) is close to 100%. However, in some patients that goal can be challenging to obtain.

Purpose: Determine whether a lower BivP% could lead to similar CRT response and events, as compared with patients with BivP% >98%.

Methods: Patients with CRT followed up in a remote-monitoring network were retrospectively analyzed. BivP% was assessed and response to CRT was defined as an absolute increase in left ventricle ejection fraction (LVEF) >5% or a relative increase in LVEF >15%.

Low BivP% was defined as <98%. Clinical, echocardiographic data and all-cause death during follow-up were evaluated. ROC curve and AUC were obtained to determine the discriminative power of BivP% as predictor of CRT response. Optimal cut-point value was obtained and patients were divided according to this value. Kaplan-Meyer survival function was used to compare survival in the different groups and the Log-rank test was used for comparison between the groups.

Results: 88 patients, 76% male, median age 73.5 (IQR 65.75-79.25) years were included. A CRT-D was implanted in 69%. Etiology was ischemic in 44%. 93% were under beta-blockers. Median LVEF before CRT was 27% (IQR 20.25-32).

44 patients (50%) had low BivP% (median 91%, IQR 96-99), 55% due to atrial fibrillation and 52% due to frequent premature ventricular complexes. After optimization of medical therapy, device programming and/or interventional procedures, we obtained a BivP >98% in 26 out of the 44 patients (59%). However, in 18 patients (20%) BivP% was <98% (median 95, IQR 92.25-96). 66% patients were CRT responders. Median follow-up was 36 (IQR 23.75-84) months. During follow-up, all-cause mortality was 27% (24 patients).

Optimal cut-point value for predicting CRT response was 91% BivP% (AUC 0.644, p-value 0.047, 95% CI 0.496-0.792). The characteristics of the two groups didn't differ significantly (Table).

Survival was significantly higher in patients with BivP% >91% (Log-rank 3.667, p-value 0.050) – Figure.

Conclusion: In this population, BivP% >91% was sufficient to achieve CRT-response and was associated with a better survival.

	BivP% <91% (n = 4)	BivP% >91% (n = 84)	p-value
Age in years, median (IQR)	72.50 (70.50-73.75)	74.00 (65.00-80.00)	0.666
CRT-D, n (%)	3 (75.0)	58 (69.0)	0.999
Ischemic cardiopathy, n (%)	3 (75.0)	35 (41.7)	0.311
LVEF before CRT, median (IQR)	27 (19-39)	27 (20-32)	0.795
Beta-blockers, n (%)	4 (100.0)	78 (95.1)	0.999

Abstract Figure.

