Cardiac resynchronization therapy (CRT) is widely used for patients with heart failure, reduced left ventricular ejection fraction (LVEF), and interventricular conduction delay. An implantable cardioverter-defibrillator (ICD) is also used to decrease the risk of sudden cardiac death (SCD) in both ischemic and non-ischemic dilated cardiomyopathies. When selecting the best device for a given patient, we have to choose between CRT with defibrillation (CRT-D) and CRT without defibrillation (CRT-P).

This controversy has been debated for more than a decade, because the only large randomized controlled trial that compared CRT-P and CRT-D with optimal medical therapy (COMPANION) was underpowered for determining differences in mortality between these 2 types of device therapies. The latest European guidelines recommend the selection of CRT-D or CRT-P for patients based on overall clinical condition, device-related complications, and cost. Factors favoring the use of CRT-P include advanced heart failure, severe renal insufficiency or dialysis, other major comorbidities, frailty, and cachexia. Factors favoring the use of CRT-D include life expectancy >1 year, stable heart failure, NYHA class II, ischemic heart disease (low and intermediate MADIT risk score), and lack of comorbidities. Although these are practical guides for deciding...
which device is preferable, other individual factors, such as the patient’s age, weight, and views regarding life, should also be considered.

In this issue of the Journal, Yokoshiki et al. investigate data from the Japan Cardiac Device Treatment Registry (JCDTR), where 378 medical facilities in Japan have registered their data. The Registry was established in 2006 by the Japanese Heart Rhythm Society to survey the actual conditions of patients undergoing implantation of cardiac implantable electronic devices (ICD, CRT-D, and CRT-P). With regard to patients’ characteristics, older age, a higher proportion of women, lower LVEF, and less history of nonsustained ventricular tachycardia (NSVT) were more prevalent in the CRT-P group than in the CRT-D group. The survival rate at 24 months, which was free of combined events such as all-cause death or heart failure resulting in hospitalization, was 22% and 42% for the CRT-D (n=620) and CRT-P (n=97) groups, respectively (P=0.0011). However, this apparent benefit of CRT-D over CRT-P was no longer significant after adjustment for covariates. It is important to note that composite endpoints, including hospitalization for heart failure, would naturally be more frequent in elderly patients, even with the mildly reduced LVEF in the CRT-P group. Moreover, there was no significant difference between the 2 groups in terms of SCD. This is a good example of “real world data,” showing that clinicians succeed in selecting patients with less risk of SCD as appropriate candidates for CRT-P. Detailed information about 4 patients with SCD in the supplementary file indicate some factors that result in a candidate not being suitable for CRT-P, as well as the abovementioned risk factors, such as long QT interval without class III anti-arrhythmic drugs, less use of β-blockers, and narrow QRS, which are not beneficial for CRT.

CRT-D may be compared with a luxury car; that is, not inferior to CRT-P, but with higher cost, reduced battery longevity, larger size, and the risk of inappropriate shock. However, it is not easy to find individuals favoring CRT-P. We must find solutions using “real world data” regarding the most suitable device for each patient. Patients with less benefit from ICD are those who will achieve LVEF normalization (>50%) after CRT. Certainly, some super responders do not need ICD, but it is difficult to judge which patient will be a super responder. A recent meta-analysis showed that late gadolinium enhancement with MRI is a powerful predictor of ventricular tachyarrhythmic events in patients with ventricular dysfunction.8 Speckle-tracking echocardiography9 and use of a quadripolar left ventricular lead10 also assist in predicting CRT responders. However, more evidence is needed to improve patient selection for ICD implantation.

Similar tendencies can be found in other countries11–13 (Table), including older age, higher proportion of women, less ischemic etiology, and higher mortality, without covariate adjustment, which are more prevalent in the CRT-P group than in the CRT-D group. Further updating of registry data, such as The CRT Survey II,14 is expected to show the trend in each country. The dilemma of choosing between CRT-P and CRT-D may not have a clear result, but more information would help in making a better choice for the unpredictable future of each patient.

References