Response to Letter Regarding “REPLACE DARE (Death After Replacement Evaluation) Score: Determinants of All-Cause Mortality Or Upgrade From the REPLACE Registry”

We were pleased to see the results of the validation work done by Barra et al\(^1\) in examining the performance of the REPLACE (Death After Replacement Evaluation) DARE score\(^2\) in their patient population. The DARE score results in their implantable cardioverter-defibrillator (ICD) replacement group of 228 patients yielded findings that were consistent, and, for some metrics, nearly identical, to those found in the REPLACE population of 1744 patients, despite a longer follow-up period (33 months versus 6 months in REPLACE).

We also appreciated the additional efforts by Barra et al\(^1\) to compare the DARE score performance to the predictive model proposed by Bilchick et al\(^3\), which was developed on a larger population of Medicare patients (n=17991) receiving de novo ICD implantation for primary prevention. Although the final risk model of Bilchick et al\(^3\) was based on 7 predictor variables in a related but somewhat different patient population with a longer average follow-up (4.4 years), the concordance with 5 of the 6 predictor variables used in the development of the DARE score model was noteworthy. Both models contained age, New York Heart Association class, and chronic kidney disease. Left Ventricular Ejection Fraction in the model of Bilchick et al\(^3\), which is known to be reduced in patients with systolic heart failure but was not routinely collected in the REPLACE study, would likely be correlated with the variable of recent heart failure admission, which was used. The variable of atrial fibrillation in the model of Bilchick et al\(^3\) had, similarly, a probable relationship with the variable of antiarrhythmic drug use in REPLACE. The 2 variables not in the DARE score model, chronic obstructive pulmonary disease and diabetes mellitus, both had univariable associations with mortality in the REPLACE study (unadjusted \(P\) values of 0.020 and 0.015, respectively) but did not make into the final DARE score as significant, independent contributors.

If there is a contribution of the DARE score beyond the results contained in the REPLACE and Bilchick predictive models, it may be that the method used in constructing the score from the underlying multivariable analyses translated those findings into a simple, well-behaved index of mortality risk that is easily accessible for use in the clinic (http://www.replacedare.org/). Although such predictive tools at their best provide only likelihoods and not guarantees of future outcomes, such information may make a useful contribution to overall decision-making about patient care.

We also recognize the interesting work that Lewis et al\(^4\), from the University of Ottawa has done on patient preferences in patient-oriented decision models.\(^5\) This group is developing a shared decision-making aid focused on ICD replacement and reports that in a survey of patients undergoing ICD replacement, there was a nonstatistical trend toward younger patients being more likely to consider declining and that many patients overestimated the benefits of ICD therapy and underestimated ICD replacement risks.

We wholly agree that at the time of ICD replacement options and preferences should be fully assessed in all patients as shared decision making. Our study reinforces some of the factors that may be considered in this assessment, and we respectfully disagree that our article implies that comorbidity and mortality risks are the only factors informing these decisions. Indeed, we showed that complications did not significantly affect survival, and this result may be reassuring to patients at high risk for complications. We aimed to add objective outcome data to the decision process. The 2 approaches should be complementary, and the REPLACE DARE score could be added to their upcoming patient decision model as a component of the education to the patient in the tool they develop. Use of both the Ottawa decision tool and the REPLACE DARE score may help to promote better decisions by more informed patients and physicians. Shared decision making cannot happen without development of scores like REPLACE DARE, which facilitate a conversation based on objective data as opposed to one influenced by bias on part of the physician or patient.

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