Correspondence

Letter by Barra et al Regarding Article, “REPLACE DARE (Death After Replacement Evaluation) Score: Determinants of All-Cause Mortality After Implantable Device Replacement or Upgrade From the REPLACE Registry”

We read with great interest the article by Chung et al1 in which the authors used data from the prospective REPLACE Registry to develop a new score that may help identify patients with substantial mortality risk after cardiac implantable electric device replacement.

We validated this new risk score in a cohort of 228 patients with ischemic or nonischemic dilated cardiomyopathy having implantable cardioverter defibrillator (ICD) generator replacement in our tertiary center and followed for 33.3±18 months. The REPLACE Death After Replacement Evaluation (DARE) score was 1.8±1.2 in survivors (n=183) versus 3.6±1.9 in nonsurvivors (n=45), with an area under the curve of 0.746±0.048 (P<0.001). Risk of death was 0% (0/18) for DARE=0 and 66.7% (24/36) for those with DARE score of 4 to 7. The hazard ratio was 1.73 for each change of 1 DARE unit. These findings are consistent with those of Chung et al.1 First, there was a near-doubling of the risk score between nonsurvivors and survivors. Second, when adjusted for the REPLACE DARE score variables, none of the other predictors were retained, as the DARE score itself was uniquely selected with a forward stepwise approach (when using a backward elimination approach, however, renal function was also included in the regression model). Third, the score behaved in an almost monotonic fashion during the range of risk, with observed mortality risks ranging from 0% in those with a DARE score of 0 to 66.7% in those with a score 4 to 7. The hazard ratio associated with the REPLACE DARE score was 1.73 for each change of 1 U, practically identical to that reported by Chung et al. Furthermore, left ventricular systolic function did not significantly contribute to the prediction of all-cause death beyond the predictive value of the DARE score. Finally, the discriminatory power of this score in our cohort, assessed through receiver operating characteristic curves, was similar to that described in the REPLACE DARE derivation study.

Nevertheless, in our cohort, other models previously developed to estimate mortality risk of patients having de novo ICD implantation2–4 showed higher discriminative power in the prediction of follow-up mortality when compared with the DARE score. As an example, a difference between areas under the curve of 0.087 when comparing the Bilchick model5 and REPLACE DARE was seen (P=0.027). Moreover, we used the integrated discrimination improvement index3 to assess any potential incremental value of DARE compared with the Bilchick score. We found an integrated discrimination improvement index and relative integrated discrimination improvement index of −0.009 and −4.1%, respectively, when comparing DARE with the Bilchick model, suggesting that the former may not add to risk classification compared with the latter. The Bilchick (hazard ratio, 1.009; P=0.002) and DARE (hazard ratio, 1.282; P=0.037) scores were entered into a stepwise proportional hazard regression model which did not retain any of the other prediction scores, but the combined model was not superior to the Bilchick score used alone (area under the curve for mortality prediction: 0.828 versus 0.820, respectively; P=0.4).

These findings must be viewed within the context of patients having ICD generator replacement and followed for longer periods of time. The REPLACE DARE score was derived from a heterogeneous cohort of patients having a panoply of procedures and was developed to estimate mortality risk within 6 months of the procedure, thus any extrapolation to specific subgroups with longer follow-up duration should be cautious. Nevertheless, although different scores may potentially be more appropriate for the prediction of the mid- to long-term mortality risk of patient specifically having ICD generator replacement, we congratulate Chung et al for another exceptional example of how much the comorbidity burden will affect the mortality of these patients. The benefit of the ICD decreases with increasing number of comorbidities to a point where patients will cease to benefit from it, highlighting the need for an optimized risk stratification model.

Disclosures

None.

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References

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