Cost Effectiveness of ICD Therapy for 1.5 Primary Prevention in the Dominican Republic

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Background

In the Dominican Republic, the national payer currently does not cover ICD implantation despite strong clinical evidence of benefit and existing ICD coverage in other Latin American countries. ICDs have been shown to be cost effective for standard primary prevention, and more so in 1.5 primary prevention (1.5PP) with additional risk factors. The purpose of this study was to estimate the cost effectiveness of ICD therapy in 1.5PP patients in the Dominican Republic.

Methods

Study

IMPROVE SCA was a prospective, non-randomized study that followed 1,913 1.5PP patients with and without ICD for a mean follow-up of 21 +/- 10.8 months. 1.5PP patients with ICDs had a 49% relative risk reduction in mortality compared to those without an ICD implant.[1]

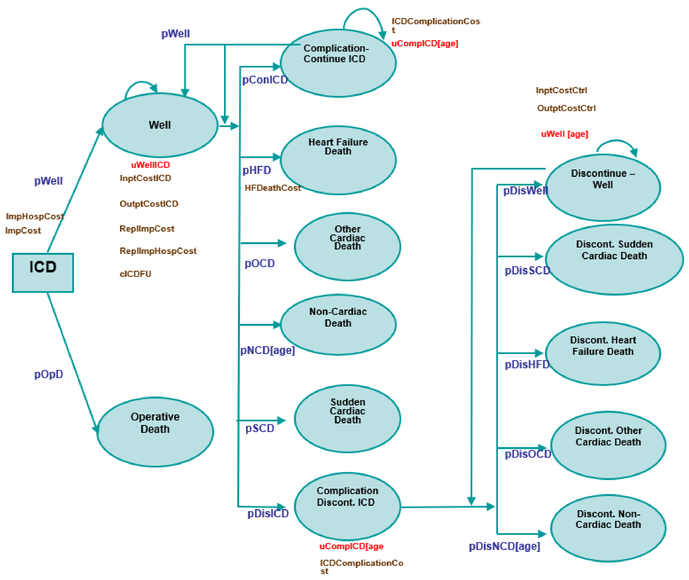

Figure 1

Methods (continued)

Modeling

A previously published Microsoft Excel based Markov model[2] was used to estimate costs and effects of ICD therapy vs. no ICD from the Dominican Republic public payer perspective (Figure 1). The model tracks a hypothetical cohort of patients over a lifetime using a 1-month cycle length.

Inputs

Mortality and utility estimates were obtained from the IMPROVE SCA clinical study. Additional inputs (e.g. complication rates) were sourced from the literature. Cost inputs were obtained from the following institutions: Centro Cardioneuro Oftalmologico y Transplante, Asociacion Instituto Dominicano de Cardiologia, Centro Cardiovascular Santo Domingo, Clinica Corazones Unidos, and Hospital Metropolitano de Santiago. EQ-5D quality of life data were sourced from IMPROVE SCA and converted to quality-adjusted life years (QALYs) from a value set specific to Latin America.[3] Costs and QALYs were discounted at 3%. The willingness-to-pay (WTP) value of US$35,070, three times the gross domestic product of the Dominican Republic in 2024.

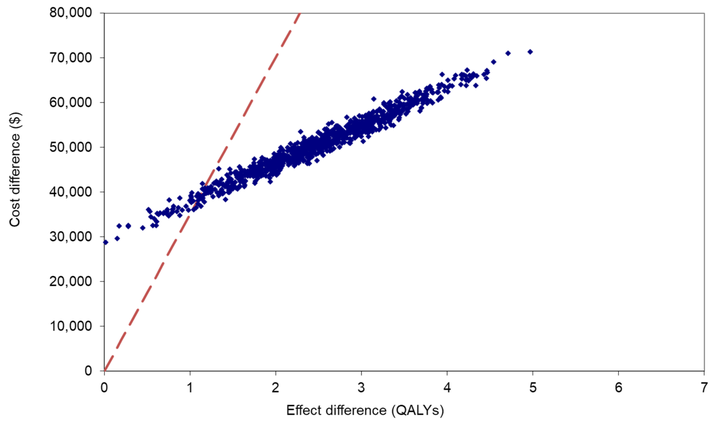

Figure 2

Results

The use of ICD therapy led to a gain of 2.53 quality adjusted life years (QALY) at an incremental cost of US$50,844 over a lifetime horizon. The discounted incremental cost effectiveness ratio (ICER) of ICD therapy over standard of care was US$20,115 per QALY, less than the WTP of US$35,070. The ICER remained lower than the WTP in 95% of the iterations in the probabilistic sensitivity analysis (Figure 2) and was robust to one-way sensitivity scenarios (Figure 3).

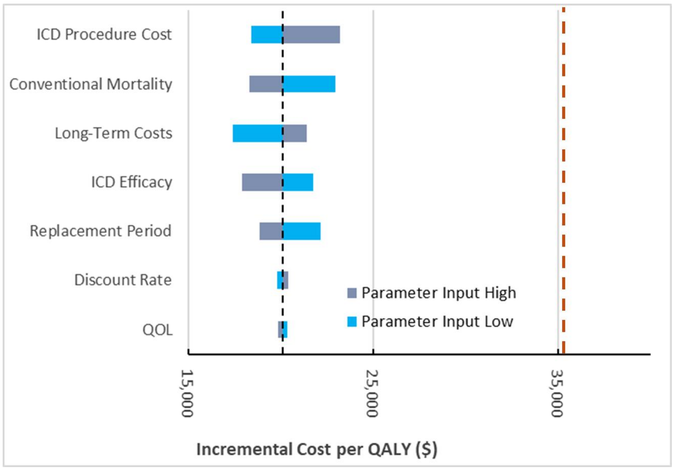

Figure 3

Discussion

A combination of global trial results and localized cost inputs provide a robust economic evaluation of this therapy. It is reasonable to consider that ICD for 1.5PP is cost effective in the Dominican Republic.

References

1. Zhang S et al. Utilization of implantable cardioverter-defibrillators for the prevention of sudden cardiac death in emerging countries: Improve SCA clinical trial. Heart Rhythm. 2020;17:468–475.

2. Cowie MR et al. Lifetime cost-effectiveness of prophylactic implantation of a cardioverter defibrillator in patients with reduced left ventricular systolic function: results of Markov modelling in a European population. Europace. 2009 Jun;11(6):716-26.

3. Zarate V et al. Hispanic Valuation of the EQ-5D Health States:A Social Value Set for Latin Americans. Value Health. 2008 Dec;11(7):1170-7.

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