Revista Argentina de Cardiología
ISSN: 0034-7000
revista@sac.org.ar
Sociedad Argentina de Cardiología
Argentina

Di Toro, Darío
Failure to Follow the Guidelines for Implantable Cardioverter Defibrillator in Primary Prevention of Sudden Death
Revista Argentina de Cardiología, vol. 83, núm. 4, agosto, 2015, pp. 359-360
Sociedad Argentina de Cardiología
Buenos Aires, Argentina

Failure to Follow the Guidelines for Implantable Cardioverter Defibrillator in Primary Prevention of Sudden Death

To the Director

The MADIT II trial showed that the prophylactic implantation of a cardioverter defibrillator (ICD) in patients with prior myocardial infarction and ejection fraction (EF) of 30% or less are associated with 31% reduction in the risk of death. (1) Later on, the evidence was confirmed by the studies on non-ischemic cardiomyopathy. (2)

Shortly after the MADIT II trial, the guidelines from three of the most important American societies included the ICD for primary prevention in Class I recommendation for ischemic and non-ischemic cardiomyopathy. (3)

Despite the great amount of information, the use of ICD for primary prevention –even in first world countries– is very low.

The reasons for this under-utilization are varied: economic constraints, lack of knowledge of the literature, lack of referral centers with qualified electrophysiologists for implantation, and physician preference.

Economic constraints would have a significant role in third world countries, but would not determine the choice globally. In the USA, where ICD acceptance is high and economic constraints are low, the rate of ICD utilization for primary prevention is 50%, and MADIT II-type candidates are estimated in 833 patients per million population. In Western European countries, with high per capita income, the history repeats itself with a 41% rate of utilization in Belgium. (4)

Social and economic considerations could explain the different implant rates among countries, but cannot account for the low implant rate in a country. In Latin America, economic constraints were the cause of non-utilization of ICD for primary prevention in only 3.7% of patients from the PLASMA study. (5) This proves that economic considerations alone cannot explain ICD under-utilization for primary prevention.

Physician unawareness of ICD effectiveness has a more significant role as cause of ICD under-utilization.

In a Latin American study performed on 1,711 patients enrolled for primary prevention, 10% of the discharged patients (n=153/1,525) had indication for ICD, and only 13% of those 153 patients had indication for a device. (5)

The main reason cited by cardiologists for not prescribing an ICD was 'indication criteria not met' (75% of patients), even though Class I guidelines confirmed that they met one indication.

A survey carried out among cardiologists and specialists in heart failure at the European congress revealed that between 25% and 65% of physicians were not aware of the major ICD trials and guidelines, and half of those respondents did not know that the guidelines had been updated as a result of these trials. (4)

Unawareness of the literature and guidelines is a vital factor when it comes to understand the low utilization rate of devices (it is unlikely that someone indicates what they do not know).

All these trials emphasize the importance of disseminating the content of the guidelines among cardiologists and general practitioners who deal with a large number of patients candidates for ICD but are unaware of its indication, mainly in primary prevention.

The availability of referral centers and the logistics required for referring candidate patients are of vital importance when it comes to device implantation. There is a direct correlation between ICD implant rates and the number of specialized centers.

In European countries with similar economies, the number of centers determines the implant rate. Implant rate in Germany, with 4.4 specialized centers per million inhabitants, is higher than in France, with 1.4 centers per million inhabitants. Even within a single country there may be disparities in implant rates. In Germany, implant rates in rural areas are lower than in urban areas, and the areas with electrophysiologists and specialized centers present a higher implant rate than those with a general hospital. (6)

Finally, some referents have a critical view on ICD indication for primary prevention.

Ejection fraction as the only criterion to indicate an ICD has been questioned by some authors. (7) The association between EF and mortality is not always dichotomous but linear. Therefore, a patient with 29% EF and another with 31% do not seem to have a big difference in terms of mortality. (8)

Mortality is not uniform in the same EF range. In a MADIT substudy, in which other risk factors were considered (FC >II, age >70, urea >26 mg/dl, QRS >120 msec, and presence of AF) and a score based on those factors was calculated, mortality was different depending on the score. Crude mortality was 28% in patients with more than one risk factor, and 43% in very high-risk patients. (9) This shows that EF as single parameter to determine ICD indication would not have enough sensitivity or specificity.

Age is another point of discussion for some authors. A meta-analysis showed that the benefit on mortality is greater in younger patients than in patients >75 years. Elderly patients are underrepresented in clinical trials, with a mean age of 65 years. However, an American registry showed that more than 40% of new ICDs are implanted in patients >70 years; this casts doubts on up to what age patients benefit from ICD implantation. (10)

Causes for under-utilization are universal, complex and multifactorial.

The situation in Argentina is unknown: we do not know how many implant centers we have, what the implant rate is, not even how many candidate patients

there are. A few years ago, the Research Area of the Argentine Society of Cardiology conducted a registry of the number of ICDs imported per year, surveyed by means of the customs registries. (11)

According to our registry, 1,058 ICDs were imported in 2007, resulting in a rate of 7.8 per million inhabitants, far below the 196 per million in USA and the 62.5 per million in Spain for that year.

One of the limitations of that registry was the difficulty in learning the type of indication, but the number was low compared with other countries.

In conclusion, the indication of devices for primary prevention is below of what it should be, resulting in preventable deaths.

There are structural causes that can hardly be changed, but there are also causes –unawareness, for example– which we must change. Each physician can have a critical view on the indications, but cannot be unaware of them. Our role is to disseminate the content of the guidelines and literature, so that all physicians can take the best decisions for their patients and improve the quality of health care.

Darío Di Toro, MTSAC
e-mail: ditorodario@yahoo.com.ar

REFERENCES

1. Moss AJ, Zareba W, Hall WJ, Klein H, Wilber DJ, Cannom DS, et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med 2002;346:877-83. http://doi.org/bmt3cd
2. Bardy GH, Lee KL, Mark DB, Poole JE, Packer DL, Boineau R, et al. Amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. N Engl J Med 2005;352:225-37. http://doi.org/fbbq86
3. Epstein A, Di Marco J, Ellenbogen K, Estes M, Freedman R, Gettes L, et al. ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2008;117:e350-408. http://doi.org/bt7rrf
4. John Camm A, Nisam S. European utilization of the implantable defibrillator: has 10 years changed the 'enigma'? Europace 2010;12:1063-9. http://doi.org/dbgpxp
5. Gonzalez-Zuelgaray J, Pellizon O, Muratore CA, Oropeza ES, Rabinovich R, Ramos JL, et al. Lack of current implantable cardioverter defibrillator guidelines application for primary prevention of sudden cardiac death in Latin American patients with heart failure: a cross-sectional study. Europace 2013;15:236-42. http://doi.org/5s5
6. Seidl K, Senges J. Geographic differences in implantable cardioverter defibrillator usage. J Cardiovasc Electrophysiol 2002;13:S100-5. http://doi.org/5s7
7. Katritsis DG, Josephson ME. Sudden cardiac death and implantable cardioverter defibrillators: two modern epidemics? Europace 2012;14:787-94. http://doi.org/5s8
8. Curtis JP, Sokol SI, Wang Y, Rathore SS, Ko DT, Jadbabaie F, et al. The association of left ventricular ejection fraction, mortality, and cause of death in stable outpatients with heart failure. J Am Coll Cardiol 2003;42:736-42. http://doi.org/b624wd
9. Goldenberg I, Vyas AK, Hall WJ, Moss AJ, Wang H, He H, et al. MADIT-II Investigators. Risk stratification for primary implantation of a cardioverter-defibrillator in patients with ischemic left ventricular dysfunction. J Am Coll Cardiol 2008;51:288-96. http://doi.org/d2qzhx
10. Epstein AE, Kay GN, Plumb VJ, McElderry HT, Doppalapudi H, Yamada T, et al. Implantable cardioverter-defibrillator prescription in the elderly. Heart Rhythm 2009;6:1136-43. http://doi.org/crh86q
11. Di Toro D, Borracci R, Rubio M, Serra J. Estimación del número de marcapasos y cardiodesfibriladores implantados anualmente en Argentina. Rev Argent Cirug 2009;27:85-90.

Rev Argent Cardiol 2015;83:359-360. http://dx.doi.org/10.7775/rac.v83.i4.6872

Consensus on Atrial Fibrillation

To the Director

It has been a great pleasure to receive the publication of the Consensus on Atrial Fibrillation of the Argentine Society of Cardiology. (1)

We would like to emphasize that, in line with the main guidelines and consensuses worldwide, the use of new anticoagulant drugs has been recommended at the same level as vitamin K antagonists.

In the description of new drug characteristics, dabigatran has been mentioned to be associated with higher rates of myocardial infarction compared with warfarin. It is important to clarify that such difference *was not statistically significant*. Regarding the RE-LY pivotal trial (2), which led to the approval of dabigatran for ischemic stroke prevention in patients with atrial fibrillation, a review of the events found in such trial had already been published in 2010, but was omitted in this consensus. (3)

This study revealed *low rates of myocardial infarction* both in the warfarin group (0.64% per year) as in the dabigatran groups (0.82% per year for the 110 mg dose group and 0.81% per year for the 150 mg dose group), with no statistically significant difference [dabigatran 110 mg vs warfarin (p=0.09); dabigatran 150 mg vs warfarin (p=0.12)]. (3) Clearly, the absolute difference in the rates of myocardial infarction was extremely low (~ 0.2% per year), limiting the statistical power to make comparisons. Such small numerical difference is even lower if only fatal myocardial infarctions are considered, with rates of 0.13%, 0.11% and 0.10% per year for dabigatran 110 mg and 150 mg, and warfarin, respectively. (4)

No less important, the rates of myocardial infarction observed in the RE-LY trial were consistent with those found in other trials on stroke prevention in patients with atrial fibrillation: between 0.53 and 1.4% per year both for warfarin and for different new oral anticoagulant drugs. (5)

Several studies and analyses on the topic were published after the consensus was written. In this regard, it is worth mentioning the findings of the RELY-ABLE study, which evaluated the safety of dabigatran during an additional follow-up of 2-3 years once the RE-LY study concluded. In that study, *rates of myocardial infarction continued to be low: 0.72%* per year for dabigatran 110 mg and 0.69% per year for dabigatran 150 mg, consistent with previous findings. (6)

In a comprehensive analysis, Clemens et al explains that the non-significant imbalance of the rate of myocardial infarction among patients on dabigatran (and considering the comparative nature of the measures of association) may result from the unusually low rate of myocardial infarction in the subgroup of