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Selection of the Best of 2016 in Clinical Arrhythmology

Selección de lo mejor del año 2016 en aritmología clínica

To the Editor,

Clinical arrhythmology is an essential field for both electrophysiologists and cardiologists: in the case of the former to prevent the specialist from becoming a technician and in the case of the latter to fully understand the specialty. The clinical guidelines reaffirm this idea while also recommending an increasingly widespread interventional approach throughout the range of arrhythmias. This concept is clearly illustrated in the interaction between arrhythmia-cardiomyopathy and ventricular dysfunction. Between 10% and 50% of patients with heart failure have atrial fibrillation (AF), and the potential worsening of ventricular function due to inappropriate rate control is recognized. In patients with ventricular extrasystole (VE), who are often referred for electrophysiological assessment, several studies have shown an incidence of arrhythmia-induced cardiomyopathy of between 9% and 34%. Although knowledge of their pathophysiology is still incomplete, a fundamental factor is now recognized to be high total extrasystole burden, defined as more than 10 000 to 25 000 VE per day (10%-24% of the total number of complexes), as well as certain clinical characteristics (male sex, high body mass index), electrocardiographic characteristics (QRS width in VE $>$ 153 ms), and anatomic features (VE origin other than ventricular outflow tract).[1] Although the incidence and prevalence of arrhythmia-induced cardiomyopathy is not known, early detection should be a priority, given the excellent response to treatment, which is generally interventional. The correlation between chronic consumption of caffeine-containing products and the degree of atrial and ventricular ectopy has still not been established.

The increasing prevalence of AF is a health challenge of the utmost importance. The 3 basic pillars of treatment include anticoagulation, rhythm control, and rate control.[2] Recent evidence reflects the benefit of reducing or modifying risk factors, for example, substantially decreasing the arrhythmic load of AF by weight loss sustained in the long term. Along these lines, the CARDIO-FIT study analyzed the impact of cardiorespiratory fitness on arrhythmia recurrence in obese individuals with AF.[3] The improvement in cardiorespiratory fitness achieved through a specific training program reduced recurrences, and this benefit was in addition to that obtained through weight loss: an increase of 1 metabolic equivalent corresponded to a 9% decrease in recurrences. Furthermore, several studies have confirmed the dose-dependent relationship between physical exercise and AF, as well as the additive effect of certain risk factors, and it was observed that more than 2000 hours of high-intensity endurance training during the course of a lifetime, tall stature ($>$ 179 cm), abdominal obesity ($>$ 102 cm in men and 88 cm in women), and sleep apnea syndrome were associated with AF.[4] The role of intensive physical endurance training may also be proarrhythmic for the ventricle, and cause anatomical functional changes in the right ventricle in predisposed individuals. These changes can be detected by imaging techniques, particularly after exercise, and are associated with potentially fatal ventricular arrhythmias.

Oral anticoagulation in AF is becoming increasingly widespread, although this therapy is still underused in elderly patients and other subgroups with greater bleeding risk. In many cases, it is worth considering alternatives such as percutaneous closure of the left atrial appendage. In addition, the first specific reversal agent for dabigatran is now on the market (idarucizumab [Praxbind]). We do not know what the clinical impact of this availability will be.

Clinical history and the electrocardiogram (ECG) are the main source of information for stratification of arrhythmic risk: seek and you shall find. In patients with Brugada syndrome and no history of cardiac arrest, an S-wave $\geq$ 0.1 mV or duration $\geq$ 40 ms in lead I has been described as a marker of risk of sudden cardiac death.[5] For this syndrome, the usefulness of quinidine in reducing malignant ventricular arrhythmias has also been confirmed. The term *early repolarization* has been used for more than 50 years now, but only in the last 10 has it been associated with sudden cardiac death. Finally, in 2015, a consensus was reached on its definition, thereby allowing appropriate characterization of this finding in the ECG for clinical investigation. Furthermore, progress in genetics is and will be important in the field of arrhythmology, and different studies continue to provide support for the clinical benefit of specific gene therapy. Genetic susceptibility determines certain aspects of the pathophysiology of many cardiac arrhythmias, and it is foreseen that the importance of genetic study will increase as the emphasis in rhythm disorders shifts to prevention.[6]

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Selection of the Best of 2016 in Implantable Defibrillators

Selección de lo mejor del año 2016 en desfibriladores implantables

To the Editor,

Although it is difficult to briefly review the most important implantable cardioverter defibrillator (ICD)-related developments from the last year (since September 2015), we consider it important to offer an outline of the articles we believe to be the most relevant for clinicians working in this field, while acknowledging that some important findings will be omitted.

The DANISH trial[1] addressed the use of ICDs in primary prevention in patients with nonischemic dilated cardiomyopathy. In this population, although ICDs are a class I indication in clinical guidelines, there is still no solid evidence for their use because no major study has examined the usefulness of these devices in this specific patient group. The DANISH study included 1116 patients with nonischemic dilated cardiomyopathy in New York Heart Association functional class II-IV receiving standard treatment for heart failure. These patients were randomized 1:1 to an ICD implant or usual clinical care. In both groups, 58% of patients underwent cardiac resynchronization therapy. After a median follow-up of 67.6 months, there were no differences in death from any cause or death from cardiovascular causes. However, there was a reduction in sudden cardiac death in ICD patients (hazard ratio [HR], 0.5; 95% confidence interval, 0.31-0.82; $P = .005$). ICDs had no benefit in patients undergoing cardiac resynchronization therapy. Although the data indicate that ICDs had a beneficial effect on total mortality in younger patients (less than 68 years), the difference was not statistically significant.

On the other hand, the work of Roth et al.[2] highlighted the benefits of drug optimization for heart failure by showing that patients with dilated cardiomyopathy who received guideline-directed medical therapy before ICD implantation have a lower mortality rate 1 year after ICD implantation (11.1% vs 16.2%).

Regarding ICD implantation, the results of the NORDIC ICD study,[3] with 1077 patients randomized to defibrillation testing at the time of ICD implantation, concur with those of previous studies reporting that systematic testing is not necessary.

A notable consensus statement on ICD programming was published by the 4 continental electrophysiology societies.[4] Numerous optimal programming-related recommendations were made, and the document particularly stressed ways to reduce inappropriate and unnecessary therapies, such as a prolonged detection duration for ventricular arrhythmia, an increased rate cutoff for ventricular tachycardia/ventricular fibrillation (VF), programming of more than 1 zone, and the use of discriminators for supraventricular tachycardia.

Regarding ICD follow-up, a Spanish multicenter observational study[5] that included 2507 consecutive patients used remote monitoring (CareLink, Medtronic) to analyze the baseline R wave amplitude and its relationship with R wave amplitude during VF detection. An R wave $\geq$ 5 mV seemed to be sufficient to ensure a rapid and accurate sensing of VF. In contrast, a median amplitude of $\leq$ 2.5 mV (interquartile range, 2.3-2.8 mV) could lead to at least a 25% rate of undersensed R waves during a VF episode. These data might be of interest in the follow-up of patients, when changes are being considered in the defibrillation lead at the time of generator replacement, and when defibrillation testing is planned in patients at high risk of complications.

Finally, it is important to highlight the work of Akar et al.[6] into remote monitoring because their results show that remote monitoring of ICDs is associated with a reduction in death from any cause and rehospitalizations. They analyzed the data of patients with an ICD, comparing patients with and without remote monitoring. A total of 37 742 patients were included in the mortality analysis and 15 254 in the readmission analysis. About 66% of the patients were at least 40 km from the implanting facility. The results found that remote monitoring was associated with a lower risk of death at 3 years (HR, 0.67; 95%CI, 0.64-0.71; $P < .0001$) and readmission for any cause (HR, 0.82; 95% CI, 0.80-0.84; $P < .0001$). These data once again show that the use of this technology should be expanded.

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