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SPECIAL ARTICLE

National Registry on Cardiac Electrophysiology (2010 and 2011)☆

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Abstract Based on a survey sent to Portuguese centers that perform diagnostic and interventional electrophysiology and/or implant cardioverter-defibrillators (ICDs), the authors analyze the number and type of procedures performed during 2010 and 2011 and compare these data with previous years.

In 2011, a total of 2533 diagnostic electrophysiologic procedures were performed, which were followed by ablation in 2013 cases, a steady increase over previous years. The largest share of this increase compared to 2010 was in atrial fibrillation, which is now the second most frequent indication for ablation, after atrioventricular nodal reentrant tachycardia.

The total number of ICDs implanted in 2011 was 1084, of which 339 were biventricular (BiV) cardiac resynchronization devices (BiV ICDs). This represents an increase in the total number relative to previous years, 2011 being the first year in which the rate of new ICD implantations in Portugal exceeded 100 per million population. However, compared to 2010, the number of BiV ICDs implanted decreased, despite the recent publication of updated European guidelines on device therapy in heart failure, which clarified and expanded the indications for implantation of these devices.

Some comments are made on the current status of cardiac electrophysiology in Portugal and on factors that may influence its development in the coming years.

PALAVRAS-CHAVE
Electrofisiologia cardíaca;
Ablação por cateter;
Cardioversor-desfibrilhador implantável;
Ressincronização cardíaca

Registo Nacional de Electrofisiologia Cardíaca (2010 e 2011)

Resumo Os autores analisam o número e tipo de procedimentos efetuados durante os anos de 2010 e 2011, com base em inquéritos enviado aos centros nacionais que durante este ano praticaram electrofisiologia diagnóstica e de intervenção e/ou implantaram cardioversores-desfibrilhadores (CDIs) e comparam estes dados com os de anos anteriores.

Em 2011 foram efectuados 2533 estudos electrofisiológicos diagnósticos, sendo seguidos de ablação em 2013 dos casos, o que representa um aumento sustentado em relação aos anos anteriores. Em relação a 2010, a maior parcela desse incremento coube à fibrilhação auricular,

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que representa já a segunda indicação mais frequente para ablação, após as taquicardias por reentrada nodal aurículo-ventricular.

O número total de CDIs implantados em 2011 foi de 1084, sendo que destes, 339 eram dispositivos com ressincronização ventricular (CDI BIV). Estes dados representam um aumento do número total em relação aos anos anteriores, sendo 2011 o primeiro ano em que se ultrapassou em Portugal a taxa de 100 novos implantes de CDIs por milhão de habitantes. No entanto verificou-se em relação a 2010 um decréscimo no número de CDI BIV implantados, apesar da publicação recente de uma revisão das recomendações europeias para o tratamento da insuficiência cardíaca por dispositivos eléctricos, que veio clarificar e expandir as indicações para implantação destes dispositivos.

São feitas algumas considerações sobre o estado atual desta actividade e sobre alguns fatores que poderão influenciar a sua evolução nos próximos anos.

Introduction

The National Registry on Cardiac Electrophysiology is an annual registry maintained by the Portuguese Association of Arrhythmology, Pacing and Electrophysiology (APAPE) and the Portuguese Institute of Cardiac Rhythm (IPRC) that, in collaboration with all national electrophysiology centers, records data on invasive electrophysiology and implantation of cardioverter-defibrillators in Portugal.

Publication of the Registry provides an overall picture of the situation in Portugal with regard to the number of participating centers and their volume of activity and the number and type of procedures performed, as well as developments over time.

The Registry is also essential for comparing Portugal with other countries, particularly as it forms the basis for Portuguese participation in the European Heart Rhythm Association (EHRA) White Book,[1] an annual publication that presents statistics on invasive electrophysiology in ESC member countries.

This article presents the data for 2011, some of which are compared with the available data for 2010 (already published in the EHRA White Book[1]).

Methods

Although most centers in Portugal now have computerized records, it has still not been possible to achieve centralized data collection for the Registry, the main reason being the different data formats used by the various centers.

Thus, as in previous years, data were collected following personal contact with the heads of the centers via email or telephone, after which forms were sent on which the required information was to be entered, which were used by most centers to submit the data by email to those responsible for the Registry.

The centers provided information on the number and type of electrophysiologic studies (EPS), diagnostic and ablation procedures, type of arrhythmias treated by ablation and number and type of implantable cardioverter-defibrillators (ICDs) implanted, including biventricular cardiac resynchronization devices (BiV ICDs).

Results

Responses were obtained from all public and private centers, although the information was incomplete for 2010.

In 2011 the number of centers performing EPS and/or ICD implantation was 27, of which 20 were public hospitals and seven private institutions.

Electrophysiologic studies and catheter ablations

There were 18 centers performing EPS in 2011, of which 11 were public and seven private. One public hospital (Faro) and two private institutions began activities in this field during 2011.

The total number of diagnostic EPS in 2011 was 2533, followed by ablation in 2013 of cases, an increase of 11.2% in ablation procedures between 2010 and 2011 (Figure 1). The number of ablation procedures has shown sustained

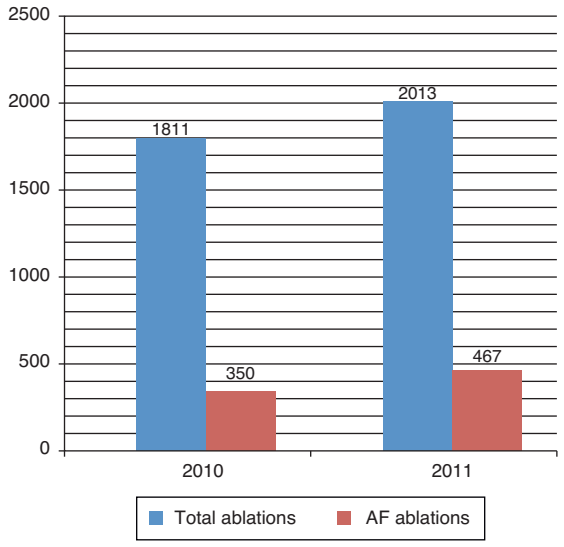

Figure 1 Total number of ablation procedures and atrial fibrillation ablations in Portugal in 2010 and 2011. AF: atrial fibrillation.

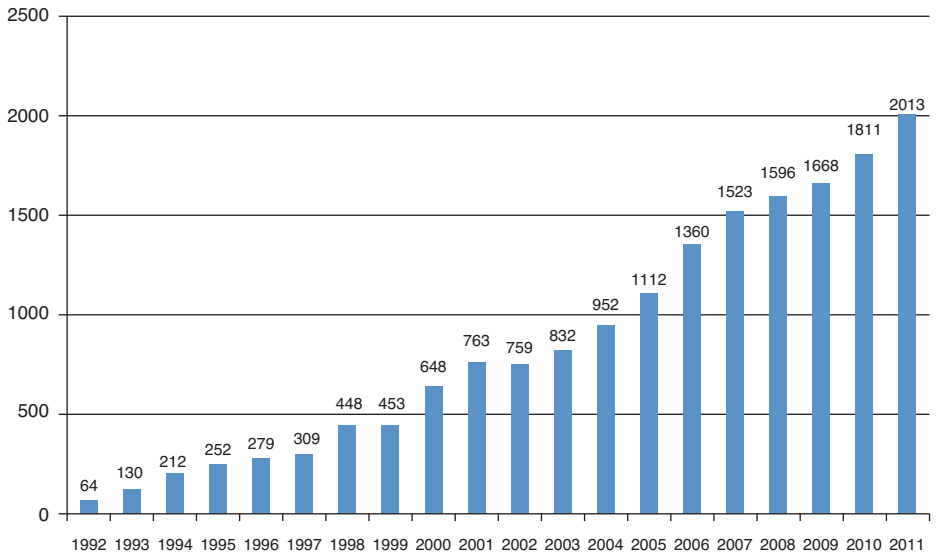

Figure 2 Total number of ablations per year from 1992 to 2011.

growth since they were first performed in Portugal in 1992 (Figure 2).

With regard to the type of arrhythmias treated, most of the increase observed was ablation of atrial fibrillation (AF) (Figure 1), rising from 350 cases in 2010 to 467 in 2011, an increase of 57.9%.

The different indications for catheter ablation in 2011 are shown in Figure 3. Atrioventricular nodal reentrant tachycardia remains the most commonly treated arrhythmia (27.9% of cases), while AF is now the second most common (23.2% of cases). Ablation of symptomatic or concealed atrioventricular accessory pathways (19.3%) and atrial flutter (18.2%) was also common, ventricular arrhythmia and atrial or atrioventricular nodal tachycardia being less frequent indications.

Figures 4 and 5 show the numbers and types of ablation procedures performed in 2010 and 2011 in the different centers. In both years, only six centers exceeded 100 ablation procedures per year, and while 10 centers performed AF ablation in 2011, only three exceeded 50 procedures. Given the need for Portuguese electrophysiologists to perform ablation of AF, an arrhythmia that is increasingly common here as elsewhere, further increases can be expected in the coming years, especially in centers that currently treat a small number of cases.

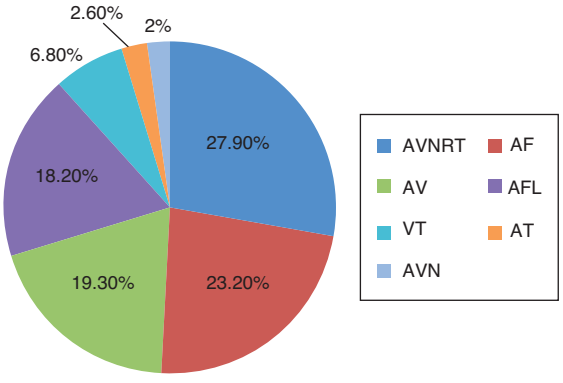

Figure 3 Indications for ablation in Portugal in 2011. AF: atrial fibrillation; AFL: atrial flutter; AT: atrial tachycardia; AV: atrioventricular accessory pathways; AVN: atrioventricular node; AVNRT: atrioventricular nodal reentrant tachycardia; VT: ventricular tachycardia.

Implantable cardioverter-defibrillators

There were 26 centers implanting ICDs in Portugal in 2011, of which 20 were public and six private (one private institution began activities in this field during 2011).

The total number of ICDs implanted in 2010 was 1014, of which 379 were BiV ICD devices. In 2011 the total number of ICDs implanted was 1084 (an increase of 6.9%), but the number of BiV ICDs was only 339, a decrease of 10.6% (Figure 6). In the same year, 202 battery replacements and 64 surgical revisions were also reported.

Figure 7 shows developments in the annual rate of new ICD implantations (all types, including BiV ICDs) per million population in Portugal; although the number fell in 2010, there was a slight increase in 2011, when for the first time Portugal exceeded an annual rate of 100 new implantations per million population.

Finally, Figure 8 shows the distribution of first ICD implantations performed by the various centers in 2011. It should be noted that it was not possible to ascertain whether ICDs without resynchronization were single- or dual-chamber devices, although based on the available data, it is estimated that around 80% were single-chamber systems.

Discussion and Conclusions

We are pleased to report that invasive electrophysiology in Portugal continues to make progress, with sustained growth in the number of interventions, particularly in catheter ablations, as the number of centers performing these procedures increases.

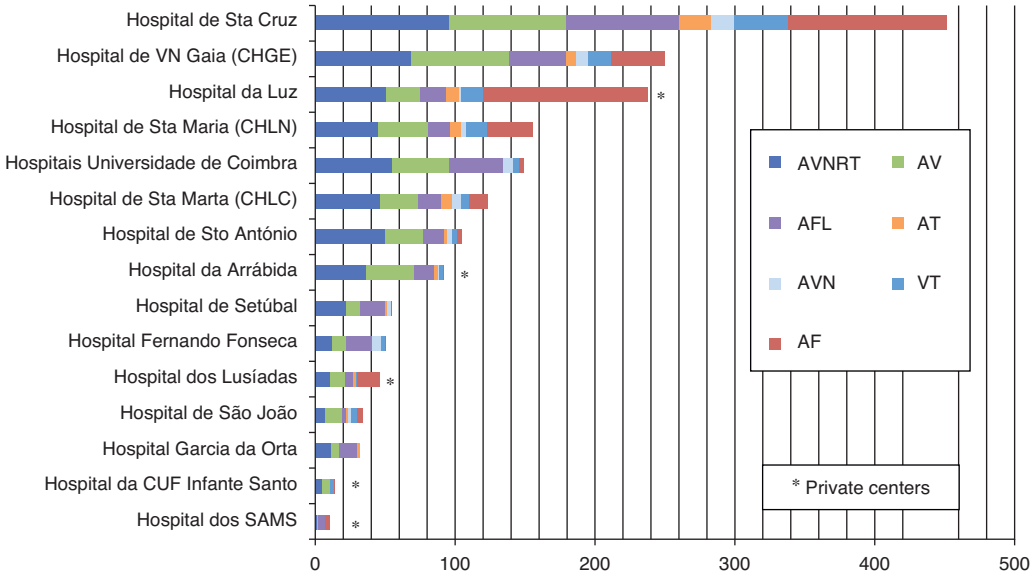

Figure 4 Number of ablation procedures by center in 2010. AF: atrial fibrillation; AFL: atrial flutter; AT: atrial tachycardia; AV: atrioventricular accessory pathways; AVN: atrioventricular node; AVNRT: atrioventricular nodal reentrant tachycardia; VT: ventricular tachycardia.

Another important point is the marked increase in the number of AF ablations, which in 2011 were performed in 10 of the 18 centers in Portugal, and AF is now the second most frequent indication for ablation in the country.

By contrast, the number of ablations for atrial tachycardia (which can be the result of complications following AF ablation) remains low (2.6% of the total). This may be due to the strategies and techniques employed in AF ablation, but the data in the Registry are insufficient to confirm whether this is the case.

Nevertheless, despite the increase observed, in many cases the total number of ablation procedures per center is still relatively low, especially in view of the need to train new specialists. Only three centers in Portugal (of which one is private) performed at least 200 catheter ablations a year, which according to the recent EHRA guidelines[2] is considered the minimum for a European center to provide training in the subspecialty of cardiac electrophysiology.

With regard to ICD implantation, after a slight decrease in 2010, this activity again increased in 2011, exceeding 100 new implantations per million population.

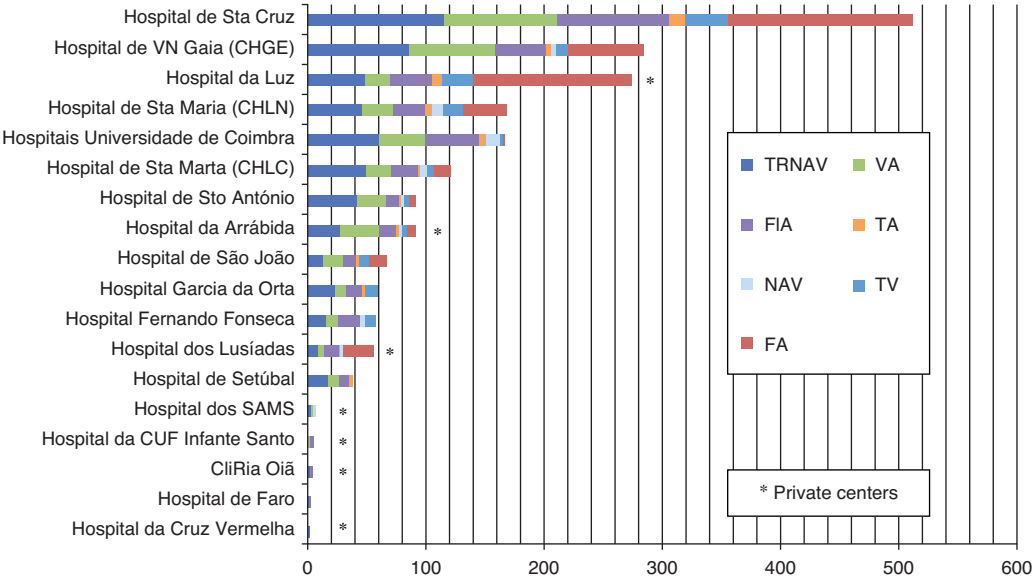

Figure 5 Number of ablation procedures by center in 2011. AF: atrial fibrillation; AFL: atrial flutter; AT: atrial tachycardia; AV: atrioventricular accessory pathways; AVN: atrioventricular node; AVNRT: atrioventricular nodal reentrant tachycardia; VT: ventricular tachycardia.

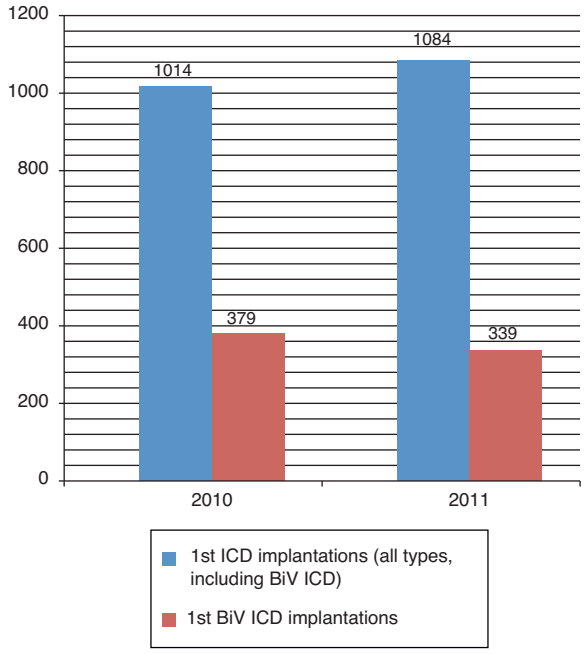

Figure 6 Number of first implantable cardioverter-defibrillators and biventricular pacemakers with defibrillator back-up implanted in Portugal in 2010 and 2011. BiV ICD: biventricular resynchronization device; ICD: implantable cardioverter-defibrillator.

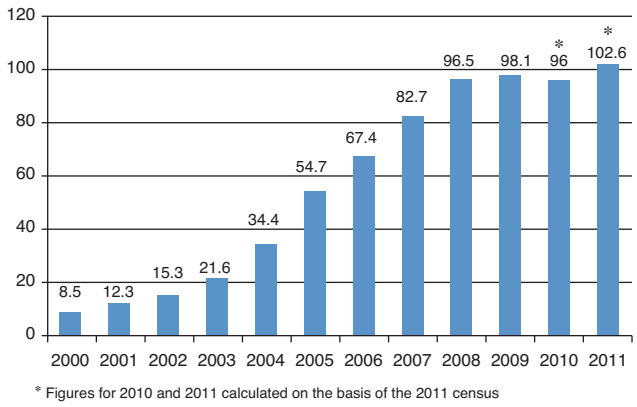

Figure 7 Number of first implantable cardioverter-defibrillators implanted, including biventricular resynchronization devices, per million population in Portugal from 2000 to 2011.

However, the fall in the number of new BiV ICD implantations is somewhat worrying in view of the publication in 2010 of updated European guidelines on device therapy in heart failure, which extended the indication for implantation of BiV ICDs to patients in NYHA functional class II, in sinus rhythm and with QRS width $\geq$150 ms.[3]

This fall could be related to the current economic climate, which may be causing difficulties for some centers in funding such interventions, despite the recognized long-term advantages in cost–benefit ratios. It will be essential to monitor developments in this activity in the coming years, as the current difficulties are likely to continue, and to raise awareness among health authorities of the clinical importance of such procedures and their long-term cost benefits.

Finally, with regard to the method of collecting data for the Registry, as stated above, personal contact with the heads of the centers was still required in order to obtain

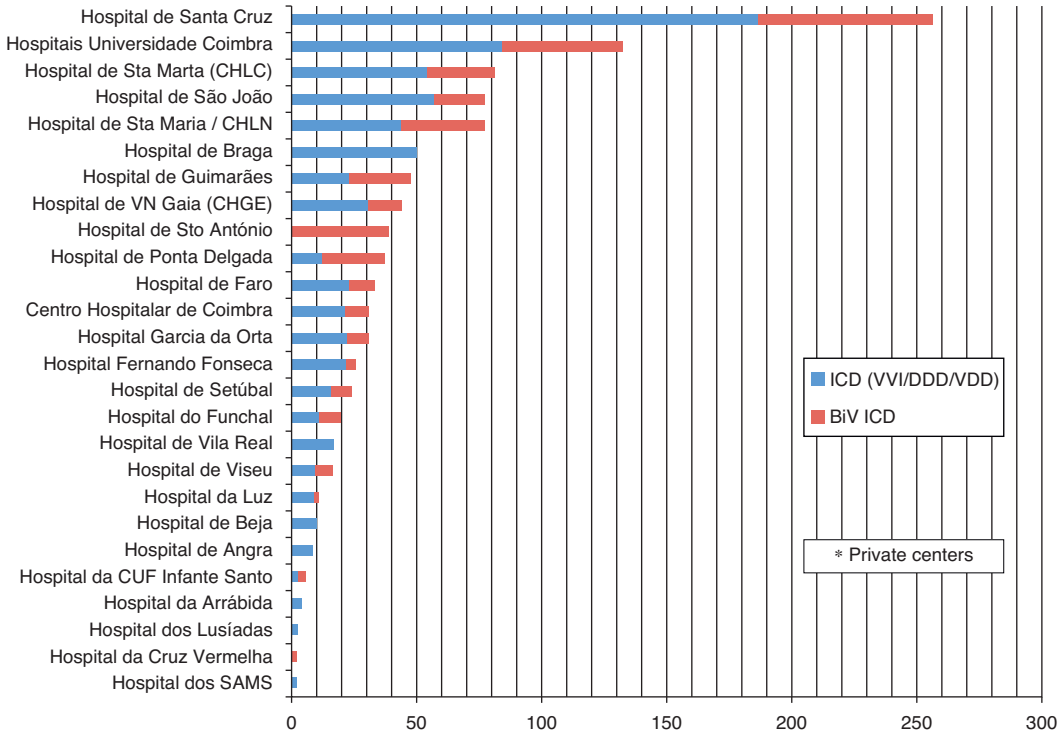

Figure 8 Number and type of implantable cardioverter-defibrillators implanted in Portugal in 2011 by center. BiV ICD: biventricular resynchronization device; ICD: implantable cardioverter-defibrillator; VVI/DDD/VDD: pacing modes.

the necessary information. The authors are grateful for their cooperation, but at a time when computerized records are now the norm in Portuguese hospitals, we are convinced that every effort should be made to achieve a centralized registry in the near future, preferably via an online platform, so as to facilitate the rapid collection and processing of data.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

Conflicts of interest

The authors have no conflicts of interest to declare.

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