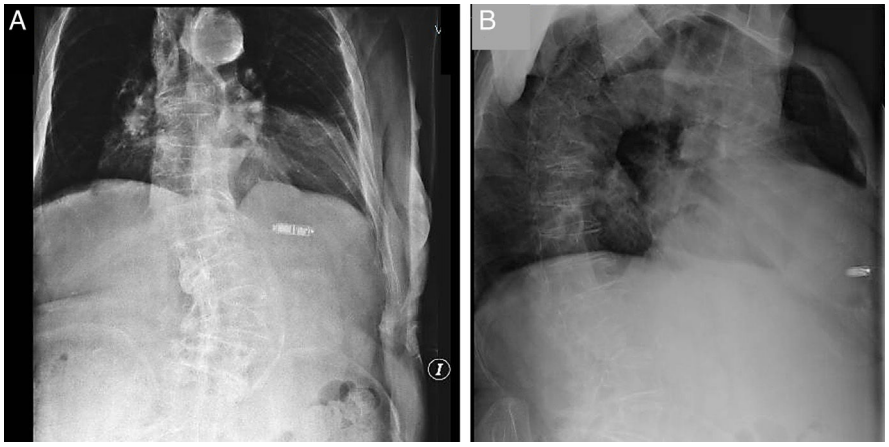

Figure 2. Posteroanterior (A) and lateral (B) chest radiographs showing the final position of the device.

stenosis or local complications such as infection. In the patient reported, manipulation of the electrode was unfeasible because of tortuosity of the thoracic venous system. Barrel chest is a thoracic cage deformity resulting from horizontalization of the ribs that leads to an increase in the anteroposterior diameter of the thorax relative to the lateral diameter. It is commonly seen in older persons with osteoarthritis of the dorsal column, and has been classically described in patients with advanced pulmonary emphysema. In severe forms, the deformity causes very abnormal positioning of the thoracic organs and their relationships with other systems. In our patient it resulted in a voluminous hiatal hernia and anterior displacement of the heart relative to the large vessels, with adaptation of the arterial and venous systems through marked elongation and tortuosity of the intrathoracic vessels.

Several studies have reported that leadless pacemakers are safe and effective in the general population requiring single-chamber pacing, with high success rates and good mid-term outcomes.[2,3] These devices can also be a solution for patients with complications at the usual access routes (infection, lead breakage, or venous stenosis).[4] Our case involving a patient with a severe chest deformity provides a clear, new example of the advantages of a leadless device over options requiring standard access routes (epicardial or femoral), which are more invasive and imply greater vulnerability of the pacing system. Use of a steerable sheath over a guide catheter to reach the right atrium allows better stability and maneuverability despite anatomic distortions. We believe that leadless pacemakers could be considered as a first-line option in patients with severe chest deformities requiring single-chamber pacing, as they additionally allow prompt hospital discharge without convalescence following the procedure.

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REFERENCES

1. Lau EW. Upper body venous access for transvenous lead placement — Review of existent techniques. *Pacing Clin Electrophysiol.* 2007;30:901–909.
2. Pachón M, Puchol A, Akerström F, Rodríguez-Padial L, Arias MA. Implante de marcapasos sin cables transcatéter Micra: experiencia inicial en un centro español. *Rev Esp Cardiol.* 2016;69:346–349.
3. Martínez-Sande JL, García-Seara J, Rodríguez-Mañero M, et al. Marcapasos transcatéter sin cables Micra. Resultados del implante y seguimiento a medio plazo en un centro. *Rev Esp Cardiol.* 2017;70:275–281.
4. Da Costa A, Axiotis A, Romeyer-Bouchard C, et al. Transcatheter leadless cardiac pacing. *Int J Cardiol.* 2017;227:122–126.

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Frequency of Atrial Fibrillation in a Large Sample of Young Adults Selected From the Spanish Working Population

Frecuencia de fibrilación auricular en una amplia muestra de adultos jóvenes extraída de la población laboral española

To the Editor,

Large studies have been carried out in Spain to determine the prevalence of atrial fibrillation (AF) in the general population,[1,2] but they do not include individuals younger than 40 years. Hence, the available epidemiologic data in this age group are very limited. The aim of this study was to determine the prevalence of AF in a large sample of the Spanish working population, with particular emphasis on the subgroups younger than 40 years of age.

The present report applies the methods used in the previously published ICARIA (Ibermutuamur CArdiovascular RIsk Assessment) study.[3] ICARIA reported the results of a cohort of 13 179 workers aged 16 to 74 years from 5 Spanish regions (Madrid, Valladolid, Murcia, Malaga, and Asturias), who underwent a medical check-up between May 2008 and November 2010, including a 12-lead resting electrocardiogram. In the present study, also of an observational, cross-sectional nature, we calculated the

Table 1
Demographic Characteristics, Work Sector, and Risk Factors of Workers With and Without AF

Characteristics	Total sample (n = 13 179)	Workers without AF (n = 13 168)	Workers with AF (n = 11)	*P*
Males	73.4	73.4	90.9	.3314
Age, y	40 ± 10.5	40 ± 10.5	52.5 ± 11.1	.0001
Age groups				.0077
16-29 y	17.2	17.2	0	
30-39 y	33.4	33.4	18.2	
40-49 y	29.6	29.6	18.2	
50-59 y	15.9	15.9	36.4	
60-74 y	3.9	3.9	27.3	
Manual worker	53.6	53.6	63.6	.7143
Nonmanual worker	46.4	46.4	36.4	
Work sector				.6253
Agriculture	0.4	0.4	0	
Industry	14.7	14.7	10	
Construction	23.5	23.5	10	
Services	61.4	61.4	80	
Smoker[a]	38.5	38.5	50	.6738
Diabetes mellitus[b]	2.3	2.2	30	<.0001
Hypertension[c]	20	19.9	54.5	.0126
Systolic pressure, mmHg	124.1 ± 15.7	124.1 ± 15.7	127.5 ± 14	.4729
Diastolic pressure, mmHg	77 ± 10.8	77 ± 10.8	79.2 ± 6.5	.4942
BMI, kg/m²	26.2 ± 4.2	26.2 ± 4.2	29.7 ± 5.1	.0060
Obesity, BMI ≥30	16.4	16.4	54.5	.0026
Morbid obesity, BMI ≥ 40)	0.5	0.5	0	1
Dyslipidemia[d]	55.4	55.4	90	.0597
Total cholesterol, mg/dL	196.2 ± 37.2	196.3 ± 37.2	182.8 ± 40.1	.2531
HDLc, mg/dL	55.3 ± 14.9	55.3 ± 14.9	43.9 ± 19.3	.0152
LDLc, mg/dL	120.5 ± 32.9	120.5 ± 32.9	115.9 ± 28.1	.6589
Triglycerides, mg/dL	110.2 ± 83.7	110.2 ± 83.7	126.3 ± 50.1	.5435
Score[e]				.0022
Low	93.9	93.9	55.6	
Moderate	1.1	1.1	0	
High	5	5	44.4	

AF, atrial fibrillation; BMI, body mass index; HDLc, high-density lipoprotein cholesterol; LDLc, low density lipoprotein cholesterol.
Values are expressed as the percentage or the mean ± standard deviation.
[a] Responded yes to the question: Do you smoke? or Do you smoke 1 or more cigarettes per day?.
[b] Diabetes type I and/or II and/or receiving insulin therapy and/or glycemia ≥ 126 mg/dL at the medical check-up.
[c] Previous diagnosis of hypertension and/or receiving antihypertensive therapy and/or systolic pressure >140 mmHg and/or diastolic pressure >90 mmHg at the medical check-up.
[d] Previous diagnosis of dyslipidemia or receiving lipid-lowering therapy and/or total cholesterol ≥ 200 mg/dL and/or LDL ≥ 160 mg/dL and/or triglycerides ≥ 200 mg/dL and/or HDL ≤ 40 mg/dL in men or ≤ 50 mg/dL in women.
[e] Ten-year cardiovascular risk according to the Framingham equation.

percentages of workers with AF in the total sample and in subgroups stratified by sex and age.

The general characteristics of the sample are shown in Table 1. There was a statistically significant association between AF and age, diabetes, high blood pressure, obesity, high risk according to the Framingham score, and lower high-density lipoprotein cholesterol levels. Percentages of AF in the various subgroups are shown in Table 2. The prevalence of AF in the overall sample was 0.083%, and 10 of every 11 recordings showing this arrhythmia were in men. In the 30- to 39-year-old age group, 2 recordings showed AF in 2 men, aged 38 and 39 years, respectively, which yielded a prevalence of 0.045% in this age group. Among 2263 workers aged 16 to 29 years, no AF cases were observed.

Published data are scarce on the prevalence of AF in Spanish adults younger than 40 years, which hampers comparison of our findings with those of other studies. The REGICOR[4] study included 1748 randomly selected men and women from the general population of Girona. The main limitation of that study was the small sample size: 273 individuals in the group aged 25 to 34 years and 341 in the group aged 35 to 44 years. An AF prevalence of 0.4% was found in the first age range, and there were no AF cases in the second. The rate observed in the 25- to 34-year-old group, presumably much higher than would be expected in the reference population, was reached because a single AF case was detected in 1 man. The DARIOS[5] study jointly analyzed the data from 6 studies performed in random samples of the general population of Barcelona, Canary Islands, Balearic Islands, Extremadura, Girona, and Toledo. The prevalence of AF in 4018 individuals aged 18 to 45 years was 0.05% (1 man and 1 woman). In this case, the main limitation was the absence of data to enable estimation of prevalence in age-related subgroups within the wide range of 18 to 45 years. The study by Carro-Hevia et al.[6] in Asturias also

Table 2
Prevalence of Atrial Fibrillation by Age Groups and Sex

Age group	Individuals, n	Prevalence of atrial fibrillation, % (n)		
		Males	Females	Total
16-29 y	2263	0	0	0
Males	1612			
Females	651			
30-39 y	4403	0.062 (2)	0	0.045 (2)
Males	3221			
Females	1182			
40-49 y	3900	0.071 (2)	0	0.051 (2)
Males	2807			
Females	1093			
50-59 y	2095	0.187 (3)	0.203 (1)	0.191 (4)
Males	1602			
Females	493			
60-74 y	518	0.688 (3)	0	0.579 (3)
Males	436			
Females	82			
16-74 y	13,179	0.103 (10)	0.029 (1)	0.083 (11)
Males	9678			
Females	3501			

points to a low rate of AF in the young Spanish population, as no cases were detected on electrocardiography performed in 1220 federated athletes aged 15 to 29 years.

The interpretation of the results in this study has several limitations. Because of the methods used, it is likely that cases of transient AF were not detected. It should be noted that paroxysmal AF is particularly more common in the young population than persistent or permanent AF. This, together with the working nature of the sample, which excludes individuals with disabling heart disease, precludes extrapolation of the rates observed to the overall Spanish population and may be the reason why our rates are lower than those reported in the OFRECE[1] study in comparable age ranges. Furthermore, individuals from only 5 Spanish regions were included; hence, the data obtained do not represent the entire working population of Spain. The paucity or absence of cases in the age groups younger than 40 years indicates that the sample size does not suffice to provide a precise estimate of the prevalence of AF in the entire Spanish working population in these ages.

In conclusion, the present report analyzes the prevalence of AF in a Spanish working population cohort with a large representation of adults younger than 40 years, which contrasts with most previous studies performed in our country. Nonetheless, the small number of cases detected in those aged 40 years and younger indicates that a larger sample would be needed to achieve precise estimation of the AF prevalence in the younger Spanish working population, and this would likely be true for other samples of apparently healthy young individuals.

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REFERENCES

1. Gómez-Doblas JJ, Muñiz J, Martin JJ, et al. Prevalencia de fibrilación auricular en España. Resultados del estudio OFRECE. *Rev Esp Cardiol.* 2014;67:259–269.
2. Cea-Calvo L, Redón J, Lozano JV, et al. Prevalencia de fibrilación auricular en la población española de 60 o más años de edad. Estudio PREV-ICTUS. *Rev Esp Cardiol.* 2007;60:616–624.
3. Rodríguez-Capitán J, Fernández-Meseguer A, García-Pinilla JM, et al. Frequency of different electrocardiographic abnormalities in a large cohort of Spanish workers. *Europace.* 2016. http://dx.doi.org/10.1093/*europace*/euw283.
4. Masiá R, Sala J, Marrugat J, Pena A. Prevalencia de fibrilación auricular en la provincia de Girona: el Estudio REGICOR. *Rev Esp Cardiol.* 2001;54:1240.
5. Baena-Díez JM, Grau M, Forés R, et al. Prevalencia de fibrilación auricular y factores asociados en España, análisis de seis estudios de base poblacional. Estudio DARIOS. *Rev Clin Esp.* 2014;214:505–512.
6. Carro-Hevia A, Fernández MM, Palacio JM, Martín EH, Castro MG, Rodríguez-Reguero JJ. ECG as a part of the preparticipation screening programme: an old and still present international dilemma. *Br J Sports Med.* 2011;45:776–779.

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Causes and Predictors of Death in Atrial Fibrillation Patients Initiating Treatment With Direct Oral Anticoagulants

Causas y predictores de muerte de los pacientes con fibrilación auricular que inician tratamiento con anticoagulantes orales directos

To the Editor,

Patients with atrial fibrillation often have numerous concurrent diseases that are associated with a worse prognosis. Although several studies have addressed the causes of death in these patients, only limited data are available from clinical practice for patients under treatment with direct-acting oral anticoagulants (DAOAs). Given that patients who receive these agents in Spain usually have a different clinical profile to those who receive vitamin K antagonists,[2,3] we evaluated the causes and predictors of death in patients with nonvalvular atrial fibrillation (NVAF) who started treatment with DAOAs in 3 Spanish health areas. For our study, we included 973 consecutive patients with NVAF who were prescribed DAOA for the first time between January 2013 and December 2014. Patients were selected from the prescription database, which includes information from all medical prescriptions of all the health areas included in the study, given that