

REFERENCES

1. Aoi S, Wiley J, Ho E, Goldberg Y, Chau M, Latib A. Transcatheter tricuspid valve implantation with the Cardiovalve system. *Future Cardiol*. 2021;17:963–969.
2. Taramasso M, Benfari G, van der Bijl P, et al. Transcatheter Versus Medical Treatment of Patients With Symptomatic Severe Tricuspid Regurgitation. *J Am Coll Cardiol*. 2019;74:2998–3008.
3. Praz F, Muraru D, Kreidel F, et al. Transcatheter treatment for tricuspid valve disease. *EuroIntervention*. 2021;17:791–808.
4. Fam NP, von Bardeleben RS, Hensey M, et al. Transfemoral Transcatheter Tricuspid Valve Replacement with the EVOQUE System: A Multicenter, Observational, First-in-Human Experience. *JACC Cardiovasc Interv*. 2021;14:501–511.

<https://doi.org/10.1016/j.rec.2022.08.011>
1885-5857/

© 2022 Sociedad Española de Cardiología. Published by Elsevier España, S.L.U. All rights reserved.

Age and stabilization of admissions for heart failure in Spain (2006-2019). The beginning of the end of the “epidemic”?



Edad y estabilización de los ingresos por insuficiencia cardiaca en España (2006-2019). ¿El principio del fin de la «epidemia»?

To the Editor,

Heart failure (HF) has been considered to be the great cardiovascular “epidemic” of the 21st century due to its high and increasing incidence and prevalence as well as its high mortality.^{1,2} One of the consequences of the enormous magnitude and severity of HF is the large number of hospital admissions, which are frequent despite treatment and lead to worsening prognosis, deterioration in the quality of life of patients and caregivers, and a high economic burden on the health care system.^{2,3} Indeed, several studies have shown that the admissions rate for HF in Spain since the 1990s has been steadily increasing⁴ and that this trend has continued in the early years of 21st century.^{5,6} The RECALCAR study of the Spanish Society of Cardiology⁶ has shown that one of the main reasons for the increasing incidence of HF admissions is population aging.

To further investigate this trend in Spain and the influence of advanced age on the number of HF hospitalizations, we studied the prevalence of admissions for HF episodes in Spanish Health Care System (HCS) hospitals. The data source was the minimum data set (MBDS) of the Ministry of Health. We selected all admissions of patients with a main diagnosis of HF between January 1, 2006 and December 31, 2019. These episodes were coded according to the International Classification of Diseases (ICD-9 until 2015; ICD-10 from 2016 onward).

From 2006 to 2009, there were 371 566 admissions for HF in Spanish HCS hospitals. However, from 2016 to 2019, there were 456 461 admissions, representing a significant increase of 22.8% (P

< .001) despite underreporting in 2016 due to changes in the coding system. Nevertheless, when adjusted for age and sex (direct method), the admission rate (age- and sex-adjusted admissions per 100 000 population) was lower from 2017 to 2019 than from 2006 to 2015 (271 vs 286; P < .001). From 2006 to 2019, the percentage of patients aged at least 75 years admitted for HF significantly increased vs all HF admissions (from 69.9% in 2007 to 77.5% in 2019 [P < .001]). The number of admissions in this age group also significantly increased from 262 629 (2006-2009) to 351 589 (2016-2019). Indeed, this 33.8% increase was larger than the increase in total HF admissions (22.8%). **Table 1** shows the trend (2006-2019) in the number of HF admissions, the age- and sex-adjusted rate of admissions per 100 000 population, the number and percentage of admissions of patients aged at least 75 years, and the number of admissions and age- and sex-adjusted rates of men and women aged at least 75 years. The overall incidence rate ratio is shown and also for the periods 2006 to 2015 and 2017 to 2019. Although there was an increasing trend in the number of admissions for HF, it can be seen that, from 2006 to 2019, the age- and sex-adjusted admission rate tended to decrease (IRR, 0.98; 95% confidence interval [95%CI], 0.98-0.99; P < .001) and then flattened from 2017 to 2019 (IRR, 1; 95%CI, 1-1; P < .001) (**figure 1A**). However, in that period, there was a significant increase in the number and percentage of HF admissions of patients aged at least 75 years (**table 1**). **Table 1** also shows a decrease in HF admissions between 2015 and 2016, which was due to changes in the MDS coding system (ICD-9 until 2015; ICD-10 from 2016 onward). However, the slope representing the increase in the number of admissions remained similar before and after the change in coding (see **figure 1B**, joinpoint model).

These results suggest 2 main points: *a*) in Spain, the age- and sex-adjusted admissions rate per 100 000 population has recently decreased; this is the first time this trend has been observed; and *b*) the percentage of admissions among patients aged at least 75 years

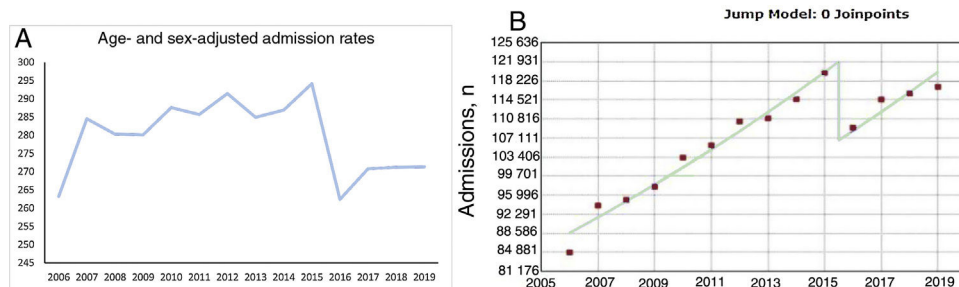


Figure 1. A: trend in the adjusted admission rates of patients aged at least 75 years admitted for heart failure. In 2016, the age- and sex-adjusted admission rate decreased (underreporting); from 2017 onward, it remains at 271/100 000 population. B: joinpoint model of the number of admissions from 2006 to 2019; there was a decrease of 12.78% per year from 2015 to 2016. The annual percentage change and average annual percentage change are significant and equal (3.4), indicating that the trend did not change.

Table 1

Number of total HF admissions, age- and sex-adjusted admission rates per 100 000 population, and admissions and percentage of admissions of HF patients aged at least 75 years in Spain from 2006 to 2019.

Year	Total admissions for HF	Admission rate ^a	Admissions for HF, age ≥75 y						
			n	%	Men	Men, age-adjusted	Women	Women, age-adjusted	Age-and sex-adjusted
2006	84 881	263.2	57 948	68.3	22 371	1708	35 574	1681	1691
2007	93 972	284.5	65 655	69.9	25 248	1850	40 406	1843	1845
2008	95 073	280.3	67 997	71.5	26 590	1868	41 406	1823	1840
2009	97 640	280.1	71 029	72.7	27 823	1880	43 204	1842	1856
2010	103 305	287.6	76 330	73.9	30 124	1960	46 205	1906	1926
2011	105 674	285.7	79 334	75.1	31 406	1969	47 936	1914	1935
2012	110 318	291.4	83 900	76.1	33 277	2031	50 622	1977	1997
2013	110 937	284.9	84 611	76.3	34 521	2055	50 090	1913	1967
2014	114 626	286.9	87 362	76.2	35 063	2057	52 298	1968	2001
2015	119 775	294.1	91 046	76.3	37 059	2135	54 347	2017	2062
2016 ^b	109 088	262.4	83 674	76.7	33 898	1904	49 773	1813	1848
2017	114 571	270.8	87 961	76.8	36 075	1995	51 885	1864	1914
2018	115 735	271.2	89 174	77.1	36 581	2000	52 591	1880	1926
2019	117 068	271.3	90 780	77.5	37 247	2004	53 533	1894	1936
Total	1 492 663	280.2	1 117 171	74.8	447 283	1972	669 870	1890	1921
IRR (95%CI)	1.02 (1.02-1.03)	0.98 (0.98-0.99)	1.03 (1.02-1.04)	1.01 (1.01-1.01)	1.03 (1.03-1.04)	1.00 (1.00-1.01)	1.03 (1.02-1.03)	1.00 (1.00-1.01)	1.01 (1.00-1.01)
P	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.030
IRR (95%CI), 2006-2015	1.03 (1.03-1.04)	1.00 (1.00-1.01)	1.04 (1.04-1.05)	1.01 (1.01-1.01)	1.05 (1.05-1.06)	1.02 (1.02-1.03)	1.04 (1.03-1.05)	1.02 (1.01-1.02)	1.01 (1.00-1.02)
P	<.001	.007	<.001	<.001	<.001	<.001	<.001	<.001	.026
IRR (95% CI), 2017-2019	1.01 (1.01-1.01)	1.00 (1.00-1.00)	1.02 (1.01-1.02)	1.00 (1.00-1.00)	1.01 (1.01-1.02)	1.00 (1.00-1.003)	1.02 (1.01-1.02)	1.01 (1.00-1.00)	1.00 (1.00-1.00)
P	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

HF, heart failure; 95%CI, 95% confidence interval; IRR, incidence rate ratio.

^a Admission rate: age- and sex-adjusted admissions rate per 100 000 population.

^b In 2016, there was underreporting due to changes in the coding system.

has continued to increase. Therefore, it could be said that admissions for HF in Spain have stabilized, especially in patients younger than 75 years. This result could be related to advances in the treatment of HF, improvements in the organization of care management due to the implementation of HF programs, or a shift in the disease to older ages due to improvements in the health determinants of Spanish citizens. However, the HF "epidemic" continues to be of immense concern and places a huge burden on the Spanish HCS, especially because of the large population of older people in Spain.

FUNDING

This study was conducted with the help of an unconditional grant from Menarini (SEC RECALCAR Project). Menarini has not participated in any part of the preparation and submission process.

AUTHORS' CONTRIBUTIONS

All the authors participated equally in the conception, design, analysis, writing, and revision of the article.

CONFLICTS OF INTEREST

None declared.

Acknowledgments

We would like to thank the Ministry of Health for its help in developing the RECALCAR project, with special thanks to the *Instituto de Información Sanitaria*.

María Anguita Gámez,^a Alberto Esteban Fernández,^b María García Márquez,^c Náyade del Prado,^c Francisco J. Elola Somoza,^c and Manuel Anguita Sánchez^{d,*}

^aServicio de Cardiología, Hospital Clínico San Carlos, Madrid, Spain

^bServicio de Cardiología, Hospital Universitario Severo Ochoa, Leganés, Madrid, Spain

^cFundación IMAS, Madrid, Spain

^dServicio de Cardiología, Hospital Universitario Reina Sofía, Instituto Maimónides para la Investigación Biomédica (IMIBIC), Universidad de Córdoba, Córdoba, Spain

* Corresponding author.

E-mail address: manuelanguita@secardiologia.es

(M. Anguita Sánchez).

 @anguita_m

Available online 10 October 2022

REFERENCES

1. Anguita Sánchez M, Crespo Leiro MG, de Teresa Galván E, et al. Prevalence of heart failure in the Spanish general population aged over 45 years. The PRICE study. *Rev Esp Cardiol.* 2008;61:1041–1049.
2. Sayago Silva I, García López F, Segovia Cubero J. Epidemiology of heart failure in Spain over the last 20 years. *Rev Esp Cardiol.* 2013;66:649–656.
3. Escobar C, Varela L, Palacios B, et al. Costs and healthcare utilisation of patients with heart failure in Spain. *BMC Health Serv Res.* 2021;20:964.
4. Rodríguez Artalejo F, Guallar Castillon P, Banegas Banegas JR, et al. Trends in hospitalization and mortality for heart failure in Spain, 1980–1993. *Eur Heart J.* 1997;18:1771–1779.
5. Anguita Sánchez M, Bonilla Palomas JL, García Márquez M, et al. Temporal trends in hospitalization and in-hospital mortality rates due to heart failure by age and sex in Spain (2003–2018). *Rev Esp Cardiol.* 2021;74:993–996.
6. Bonilla Palomas JL, Anguita Sánchez M, Elola Somoza FJ, et al. Thirteen-year trends in hospitalization and outcomes of patients with heart failure in Spain. *Eur J Clin Invest.* 2021;51:e13606.

<https://doi.org/10.1016/j.rec.2022.08.009>

1885-5857/

© 2022 Sociedad Española de Cardiología. Published by Elsevier España, S.L.U. All rights reserved.

Twelve-month effect of a 2-month training program conducted in primary care for patients at cardiovascular risk



Efecto a los 12 meses de un programa de entrenamiento de 2 meses realizado en atención primaria para pacientes con riesgo cardiovascular

To the Editor,

Despite the importance of physical activity (PA) for cardiovascular health, only 60% of the European population comply with the World Health Organization's recommendations (at least 150 minutes of moderate PA per week).¹ Effective interventions to encourage PA are

urgently needed. The different strategies reported so far have shown a moderate effect for up to 3 to 6 months after the intervention, but there is little evidence from longer follow-up periods.² In a clinical trial, our working group on primary cardiovascular prevention previously demonstrated the short-term positive impact on moderate PA of a 2-month training program (TP) delivered in primary care.³ The aim of the present study was to evaluate whether this effect persisted at 1 year after completion of the program.

The study design and methods have been described previously.³ Briefly, the program included sedentary patients of both sexes, aged between 35 and 70 years, who were at risk of cardiovascular events: with type 2 diabetes, metabolic syndrome, or hypertension, and at least 1 other cardiovascular risk factor. The control group (CG) and the intervention group (IG) received an

Table 1

Baseline values for sociodemographic data, cardiovascular risk factors, and physical exercise for the patients assessed at 1-year of follow-up and between-group differences

	Control group (n = 55)	Intervention group (n = 56)	P
Demographics			
Age, y	59.1 ± 7.9	59.8 ± 7.4	.638
Male	29 (52.7)	34 (60.7)	.396
<i>Abdominal circumference, cm</i>			
Men	105.7 ± 10.8	110.8 ± 11.5	.084
Women	110.0 ± 8.2	105.8 ± 13.4	.189
Body mass index	31.1 ± 4.1	30.8 ± 4.7	.702
Smokers	19 (34.5)	20 (35.7)	.855
<i>Educational level</i>			
Primary education	29 (52.7)	30 (54.5)	
Secondary education	20 (36.4)	15 (27.3)	
Further education	6 (10.9)	10 (18.2)	
Live alone	10 (18.2)	4 (7.3)	.151
Cardiovascular risk factors			
<i>Hypertension</i>			
Systolic blood pressure, mmHg	139.7 ± 15.7	143.9 ± 17.1	.177
Diastolic blood pressure, mmHg	89.8 ± 9.1	90.4 ± 8.9	.753
<i>Dyslipidemia</i>			
Total cholesterol, mg/dL	208.1 ± 36.7	196.4 ± 41.4	.124
HDL-C, mg/dL	51.0 ± 11.0	51.4 ± 12.2	.871
LDL-C, mg/dL	123.6 ± 30.0	115.9 ± 30.6	.227
Triglycerides, mg/dL	148.7 ± 101.1	149.2 ± 81.6	.979
<i>Diabetes</i>			
Glycated hemoglobin, %	6.8 ± 1.1	6.7 ± 1.3	.804
Physical exercise			
Sufficient amount of exercise* (≥ 360 MET-min/week)	3 (5.4)	2 (3.6)	.679

HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; MET, metabolic equivalent.

Values are expressed as mean ± standard deviation or No. (%).

* Recorded with international physical activity questionnaire, long version.