

Scientific letters

Improving Medical Attention Through an Integral Care Model for Patients With Ischemic Heart Disease or Atrial Fibrillation



Mejorar la atención médica mediante un modelo integrado de asistencia para pacientes con cardiopatía isquémica o fibrilación auricular

To the Editor,

Recently, substantial discrepancies have been detected between clinical guideline recommendations and the actual treatment prescribed¹ to patients with ischemic heart disease (IHD) or atrial fibrillation (AF). In this study, we assessed the impact of a change from a classic model of care coordination between primary care (PC) and cardiology to a more integrated model in the region covered by Hospital Moisès Broggi (Barcelona, Spain), on target low-density lipoprotein cholesterol (LDL-C) levels in patients with IHD and on the degree of anticoagulation in patients with AF.

This was an ecological study of aggregate data by center, which involved a retrospective analysis of the characteristics of the patients who received care at the centers where the new integrated model was implemented (426 377 patients; 19 PC centers) and those who received care at centers where the classic model (105 936 patients; 6 PC centers) at one time point before (2013) and one time point after (2017) the introduction of the integrated care model. In the classic model, the patients are seen by a cardiologist in the hospital outpatient cardiology clinic, for their first and subsequent follow-up visits. In the integrated model, a cardiologist goes once a week to the PC centers, where they hold in-person or virtual consultations and joint sessions (our group has analyzed these data in a study that is pending publication).

At the study start, 32.0% and 32.5% of the patients with IHD in the integrated care and classic care models, respectively, were women. The mean age was 72.7 ± 11.6 and 71.8 ± 12.1 years. In the areas where the new model was implemented, there was a higher intensity of lipid-lowering therapy, and the mean LDL-C value decreased (from 92.7 to 85.3 mg/dL) significantly compared with the classic group (87.8 to 87.1 mg/dL). This translated to a higher percentage of LDL-C target levels being met (from 20.8% to 34.1% [relative increase of 63.9%] and from 27.1% to 31.2% [relative increase of 15.1%]; $P < 0.001$) (Table 1).

At baseline, 50.9% and 54.3% of the patients with AF were women, and the mean age was 80.3 ± 10.5 and 79.2 ± 11.1 years. In the integrated care centers, the percentage of patients on anticoagulant therapy increased significantly (from 69.3% to 80.2% [relative increase of 15.7%]; $P < 0.001$), unlike in the classic model (from 74.8% to 75.4% [relative increase of 0.8%]; $P = \text{NS}$; $P < 0.001$ between groups). Similarly, while there was a marked decrease in use of antiplatelets in the integrated model group, in the classic model this reduction was smaller (relative decrease of 55.3% vs 31.0%; $P < 0.001$). Although the prescription of direct-acting anticoagulants increased in both groups, the increase was larger in the patients receiving care under the new model (from 7.9% to 36.6% and 4.1% to 18.4%; $P < 0.001$). Both groups had a similar increase in international normalized ratio (INR) monitoring carried out in PC, with no differences regarding good INR

Table 1

Incidence/prevalence and Lipid Parameters of Patients With Chronic Ischemic Heart Disease According to Care Model

	Integrated care	Classic model	P
<i>Patients with ischemic heart disease, n</i>			—
2013	9150	2878	
2014	9281	2924	
2015	9548	2988	
2016	10 122	2996	
2017	10 380	3099	
<i>New cases of patients with ischemic heart disease, n (%)</i>			NS
2013	669 (7.3)	213 (7.4)	
2014	614 (6.6)	208 (7.1)	
2015	653 (6.8)	174 (5.8)	
2016	670 (6.6)	154 (5.2)	
2017	673 (6.5)	214 (6.9)	
<i>Patients with at least 1 LDL-C measurement, %</i>			NS
2013	55.9	55.4	
2014	57.7	56.8	
2015	62.2	59.6	
2016	62.3	46.7	
2017	60.7	61.2	
<i>Lipid-lowering therapy, %^a</i>			
<i>Low-intensity statins</i>			< .001
2014	55.3		
2016	36.3		
<i>High-intensity statins</i>			NS
2014	37.7		
2016	42.3	NA	
<i>Statins + ezetimibe</i>			< .001
2014	6		
2016	17.3		
<i>Other</i>			.01
2014	1		
2016	4		
<i>Mean LDL-C (mg/dL)</i>			.001
2013	92.7	87.8	
2014	89.1	87.9	
2015	89.6	86.8	
2016	86.8	85.5	
2017	85.3	87.1	
<i>Patients with LDL-C < 70 mg/dL, %</i>			.001
2013	20.8	27.1	
2014	24.7	25.7	
2015	25.1	28.9	
2016	29.6	33.5	
2017	34.1	31.2	

LDL-C, low density lipoprotein cholesterol; NA, not available; NS, not significant.

^a Data on lipid-lowering therapy in the group of patients treated under the traditional model of care were not available. The comparisons of lipid-lowering therapies were performed between 2014 and 2016 with a sample of 300 patients treated under the integrated care model.

control, defined as time in therapeutic range $\geq 60\%$. No significant differences were found between the 2 groups in the CHA₂DS₂-VASc score (Table 2).

Table 2

Incidence/prevalence of AF and Antithrombotic treatment According to Care Model

	Integrated care	Classic model	P
Patients with AF, n			—
2013	7356	2098	
2014	7627	2211	
2015	7952	2554	
2016	8799	2272	
2017	9056	2671	
New cases of patients with AF, n (%)			NS
2013	993 (13.5)	323 (15.4)	
2014	1031 (13.5)	317 (14.3)	
2015	1083 (13.6)	299 (11.7)	
2016	1066 (12.1)	236 (10.4)	
2017	1163 (12.8)	311 (11.6)	
Antithrombotic treatment (none/antiplatelet/anticoagulant), %			< .001
2013	8.8/21.9/69.3	7.8/17.4/74.8	
2014	9.8/17.4/72.8	8.6/14.3/77.1	
2015	9.0/14.5/76.5	13.2/14.6/72.2	
2016	11.9/13.0/75.1	7.2/11.8/81.0	
2017	10.0/9.8/80.2	12.6/12.0/75.4	
Patients with known CHA ₂ DS ₂ -VASc score, n (mean CHA ₂ DS ₂ -VASc)			
2017	974 (3.2)	200 (3.4)	NS
Patients with CHA ₂ DS ₂ -VASc = 0, n (%)			
2017	49 (5.0)	6 (3.0)	NS
Patients on anticoagulation with CHA ₂ DS ₂ -VASc = 0, n (%)			
2017	16 (32.7)	4 (66.7)	NS
Type of anticoagulant therapy (VKA/DAOA), %			< .001
2013	92.1/7.9	95.9/4.1	
2014	84.9/15.1	94.8/5.2	
2015	78.0/22.0	92.0/8.0	
2016	71.7/28.3	89.7/10.3	
2017	63.4/36.6	81.6/18.4	
Patients on VKA and good INR control, %			NS
2013	59.8	59.3	
2014	59.4	59.3	
2015	57.4	58.7	
2016	57.5	58.1	
2017	57.4	59.4	
INR monitoring in primary care, %			NS
2013	58.4	35.7	
2014	67.7	47.0	
2015	74.7	58.3	
2016	87.5	62.4	
2017	88.7	59.2	

AF, atrial fibrillation; DAOA, direct-acting oral anticoagulants; INR, international normalized ratio; VKA, vitamin K antagonist.

While LDL-C control has improved over the past decade in Spain, more than 70% of patients on secondary prevention still do not meet target levels, suggesting that, despite treatment intensification, treatment is insufficient.² Our results show that there was a similar increase in the 2 groups in the number of LDL-C measurements, which would suggest a greater awareness of achieving LDL-C targets. However, the integrated model was associated with a higher intensity of lipid-lowering therapy (greater use of high-potency statins and above all combined

treatment), which would explain the greater reduction in LDL-C and consequently the higher proportion of patients meeting targets. Thus, an integrated care model can help to improve LDL-C control in secondary prevention. Unfortunately, the figures are still very poor,² indicating that greater effort is needed.

Most patients with AF should be on anticoagulant therapy. However, previous studies have shown that up to one-third of patients at high risk are not anticoagulated in practice,³ a figure that is similar to that found in 2013 in both groups. Our data indicate that, although there is still a percentage of patients that are not on anticoagulation, integrated care could substantially reduce these levels. Approximately 40% to 45% of the patients had poor INR control, independently of the type of care received, a finding similar to previously-reported figures,⁴ suggesting that additional measures are required. Direct-acting anticoagulants are particularly indicated for patients with poor INR control. In Spain they are clearly underused. Our data suggest that the integrated care model could help to detect these patients and optimize the prescription of these anticoagulants.

In conclusion, our data show that PC-cardiology integrated care can improve LDL-C control in secondary prevention and optimize anticoagulant therapy in patients with AF, which could ultimately improve health outcomes.

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The Multivalvular Score for Predicting the Outcome of Mitral Regurgitation in Aortic Stenosis Patients Treated With TAVI: Prospective Validation



El Multivalvular Score para predecir la evolución de la insuficiencia mitral en pacientes con estenosis aórtica tratados con TAVI: validación prospectiva

To the Editor,

Up to 45% of patients with severe aortic stenosis (AS) have concomitant moderate or severe mitral regurgitation (MR).¹ The high rate of multivalvular disease is due to the elevated filling pressures of the left ventricle resulting from the increased afterload due to severe AS and the parallel deterioration of both valves due to the aging process. Clinical practice guidelines recommend surgical repair or replacement of both valves in this scenario, although this recommendation remains controversial due to the limited evidence and the higher mortality associated with this strategy.² Indeed, many patients undergo single surgical or percutaneous aortic valve replacement. The growing use of transcatheter aortic valve implantation (TAVI) in these patients suggests an improvement in the degree of MR in more than 50% of cases, with a parallel decrease in the cardiac mortality rate during follow-up.³ Therefore, it is crucial to identify patients who could potentially improve in the concomitant degree of MR following TAVI. Previous studies have identified some predictors of MR persistence in this scenario, including calcification of the mitral apparatus, organic valvular disease, mitral annular dilatation, atrial fibrillation, left bundle branch block, and pulmonary hypertension.² Recently Cortés *et al.* have determined the impact of these and other factors in 177 patients with moderate or severe MR who underwent TAVI and whose echocardiographic and computed tomography images were centrally analyzed.³ Following characterization of the main predictors of MR persistence, software named the *Multivalvular Score* was developed. This software is easy to use and helpful to the Heart Team when making clinical decisions about candidates for valve interventions (Figure 1A). This tool is available as open-access software for computers through a link,⁴ as a free app for smartphones, or as an analog numeric scale, as shown in Figure 1C. The calibration value was 3.960 ($P = .776$) and discrimination was 0.781 (95%CI, 0.671–0.892).

By using this software, we aimed to perform a prospective validation of the score. A total of 144 patients with moderate or severe MR from 4 institutions who underwent TAVI between April, 2009 and June, 2016 were evaluated with the Multivalvular Score and clinical results 1 year after the procedure were compared with the predicted outcomes. The main clinical and

imaging characteristics were similar to those of the original study³ and are summarized in Table 1.

MR improved by at least 1 degree according to European guidelines at the 6-month follow-up in 73 patients (50.7%) and the improvement persisted in 69 (47.9%) at 1 year. The sensitivity and specificity of the Multivalvular Score in this population were 0.821 and 0.652, respectively, as shown in Figure 1B (area under the curve = 0.772 [95%CI, 0.663–0.881], $P < .001$). The 6-month mortality rate in these patients was 31.9% compared with 35% in the initial sample ($P = \text{NS}$).

The Multivalvular Score is the first tool fully available for clinical use that has demonstrated a certain capacity to predict the outcome of moderate or severe MR following TAVI. This scenario is often faced by the Heart Team and, until now, only surgical scores have been available. These scores can be used to determine the risk of dual valve replacement but are not useful to select which patients might benefit from more conservative approaches with single aortic valve replacement. Although there are certain limitations regarding the accuracy of the Multivalvular Score, its prospective validation opens a gate to more extensive use that will help to improve the accuracy of this tool, as well as to extend its applicability to alternative scenarios where more than 1 valve is severely affected.^{5,6}

In conclusion, this research adds evidence confirming the constant improvement of MR following TAVI in half of the patients and validates the Multivalvular Score as a simple tool that helps to predict which patients with concomitant AS and moderate or severe MR will improve after isolated TAVI. Conversely, it is also crucial to identify those patients who will require a surgical, percutaneous, or hybrid strategy to repair both valves.

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