this (Figure). The presence of calcified areas is only compatible with treatment with MitraClip if there is a good valve area in general (> 4 cm^2) and the rest of the valve is sufficiently flexible.
- Valve area: ideally, the available area should be > 4 cm^2, although a smaller area can be tolerated (up to 3 cm^2) provided the valves are flexible and not thickened or calcified. In the patient series presented, the average valve area was 4.14 cm^2, and it was possible to implant 2 MitraClip devices without producing stenosis in 4 of the 5 patients.

The outcomes of MitraClip implantation were successful in both reducing mitral regurgitation and producing clinical improvement; mean follow-up was 9.6 months. All patients had an initial improvement in functional class to at least grade II, although at follow-up, 3 patients with severe ventricular dysfunction had deteriorated in functional status. In one of them, mitral regurgitation progressed to grade II-III.

In conclusion, MitraClip may be an option for patients with mitral regurgitation after TAVI, although complex valvular anatomies can be expected; therefore, it is advisable to perform the treatment in centers with a high patient volume. Registries are needed to define the clinical profile of the patients that may benefit most from this treatment.

CONFLICTS OF INTEREST

F. Carrasco-Chinchilla, R. Estévez-Loureiro, and X. Freixa declare a possible conflict of interest due to collaboration with Abbott vascular.

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Available online 2 March 2017

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http://dx.doi.org/10.1016/j.rec.2017.02.009
1885-5857/

Impact of Autoimmune Disease on the Management and Prognosis of Acute Coronary Syndrome

Impacto de las enfermedades autoinmunitarias en el tratamiento y el pronóstico del síndrome coronario agudo

To the Editor,

Patients with autoimmune disease have worse short-term prognosis after acute coronary syndrome (ACS).[1–3] Studies are needed in Spain to analyze the possible reasons for this and to determine long-term prognosis after discharge from hospital.

This was a retrospective observational study of patients admitted to a tertiary hospital for ACS between January 2011 and February 2016. The study was conducted according to the tenets of the Declaration of Helsinki and was approved by the ethics committee of the hospital.

The primary objective was to determine the prognostic influence of autoimmune disease on all-cause death, type 3 to 5 major bleeding according to the Bleeding Academic Research Consortium classification,[4] and a composite endpoint of nonfatal acute myocardial infarction and stroke. The primary objective was assessed in patients who were alive after at least 1 year of follow-up (n = 1742). Events were recorded by telephone contact or extracted from medical records. The secondary objective was to determine the characteristics, presentation, and treatment of ACS in patients with and without autoimmune disease. For this objective, the overall population was analyzed (n = 2236).

The effect of autoimmune disease was calculated by Cox regression with adjustment for age, diabetes mellitus, atrial fibrillation, peripheral vascular disease, cerebrovascular disease, neoplasms, chronic obstructive pulmonary disease, Killip score ≥ 2 on admission, heart rate, systolic blood pressure, hemoglobin, troponin T, glomerular filtration rate, left main coronary artery disease and/or 3-vessel coronary artery disease, and ventricular function. The cumulative incidence of events was estimated with the Kaplan-Meier method and was compared using the log-rank test.

Among patients with ACS, 74 had autoimmune disease (prevalence of 3.3%). Of these, the most prevalent were rheumatoid arthritis (24 patients), spondyloarthritis (14 patients), and inflammatory bowel disease (10 patients). The median duration of autoimmune disease was 14 years (interquartile range, 4-14 years). Seventy percent of the patients were receiving corticosteroid treatment, 50% disease-modifying therapy/immunosuppressants, 22% anti-inflammatory agents, and 8% biological therapy.

There was a higher prevalence of atrial fibrillation and obstructive pulmonary disease in patients with autoimmune

Table
Differences in Baseline Characteristics, Presentation, and Additional Tests According to the Presence of Autoimmune Disease

Variables	Without AID	With AID	*P*
Patients, n	2162	74	
Baseline characteristics			
Age, y	68 ± 13	67 ± 13	.863
Males	1603 (74)	51 (69)	.310
Diabetes mellitus	1044 (48)	29 (39)	.122
Hypertension	1573 (73)	52 (70)	.632
Dyslipidemia	1595 (74)	55 (74)	.921
Smoking	1248 (58)	47(64)	.323
Prior ischemic heart disease	863 (40)	30 (41)	.917
Chronic heart failure	115 (5)	5 (7)	.590
Cerebrovascular disease	255 (12)	6 (8)	.331
Peripheral artery disease	174 (8)	9 (12)	.205
Atrial fibrillation/flutter	312 (15)	19 (26)	.008
Malignancy	100 (5)	2 (3)	.435
Chronic obstructive pulmonary disease	226 (11)	18 (24)	< .001
Signs and symptoms			
Chest pain	1819 (85)	60 (81)	.885
Dyspnea	118 (6)	6 (8)	.833
Cardiac arrest	51 (2)	2 (3)	.939
Systolic blood pressure, mmHg	134.4 ± 28.0	127.6 ± 28.1	.038
Diastolic blood pressure, mmHg	72.6 ± 15.2	70.8 ± 15.2	.309
Heart rate, bpm	76.6 ± 18.8	82 ± 20.1	.014
Killip score ≥ 2	486 (23)	22 (30)	.152
Laboratory parameters			
Glucose, mg/dL	162.1 ± 80.2	165.7 ± 82.5	.702
Glomerular filtration rate (MDRD), mL/1.73 m^2	77.6 ± 27.2	71.7 ± 26.1	.066
Hemoglobin, g/dL	13.8 ± 1.9	13.1 ± 2.2	.001
Ultrasensitive troponin T, ng/L	31 [8-159]	31 [3-254]	.883
Revascularization strategy			
Coronary angiography	1886 (89)	65 (88)	.862*
Revascularization	1556 (84)	54 (84)	.901
Complete revascularization	1064 (57)	35 (55)	.853
Percutaneous intervention	1469 (78)	53 (82)	.516
Use of drug-eluting stents	1145 (61)	35 (54)	.280
Myocardial revascularization surgery	80 (4)	1 (2)	.283
Left ventricular ejection fraction, %	53.8 ± 12.2	50.2 ± 15.6	.016

AID, autoimmune disease; MDRD, Modification of Diet in Renal Disease 4.
Unless otherwise indicated, values are expressed as n (%), mean ± SD, or median [interquartile range].
* Referenced to the overall population (the other percentages refer to patients who underwent coronary angiography).

diseases as well as higher systolic blood pressure, heart rate, hemoglobin, and ejection fraction. In both groups, coronary angiography and revascularization (preferentially percutaneous) were performed in a high percentage of patients (84% in both groups; *P* = .901). Complete revascularization and use of drug-eluting stents were reported in similar percentages of patients (Table). There was a higher proportion of left main coronary artery disease and/or 3-vessel coronary artery disease in patients without autoimmune disease (21% vs 11%, *P* = .043).

A numerically higher proportion of patients was treated with clopidogrel as the second antiplatelet agent in patients with autoimmune disease (81% vs 71%, *P* = .079). No differences were detected in the use of other drugs used for secondary prevention (*P* > .1 for all comparisons).

After a median follow-up of 397 days (interquartile range, 375-559 days), patients with an autoimmune disease had a higher mortality rate on discharge (25.8% vs 10.9%; log-rank test, *P* = .001) (Figure A). Of the 15 deaths in patients with autoimmune disease, 11 were of cardiovascular causes (7 sudden deaths and 4 due to acute myocardial infarction). Major bleeding tended to occur more frequently in patients with autoimmune disease (10.3% vs 4.2%; log-rank test, *P* = .089), and almost 70% were of gastrointestinal origin (Figure B).

Autoimmune disease is an independent risk factor for death after discharge (adjusted hazard ratio [aHR], 1.95; 95% confidence interval [CI], 1.05-3.62; *P*,=,.035). There was a trend toward a higher risk of major bleeding events (aHR = 2.35; 95% CI, 1.0-6.9; *P* = .055). The aHR for stroke and repeat infarction was 1.66 (95%CI, 0.77-3.61; *P* = .200).

Our series provides relevant information on long-term prognosis, with follow-up of more than 1 year, which has not been reported previously.[1–3] The majority of deaths in patients with autoimmune disease were of cardiovascular causes, and therefore a certain vulnerability persists after ACS despite similar

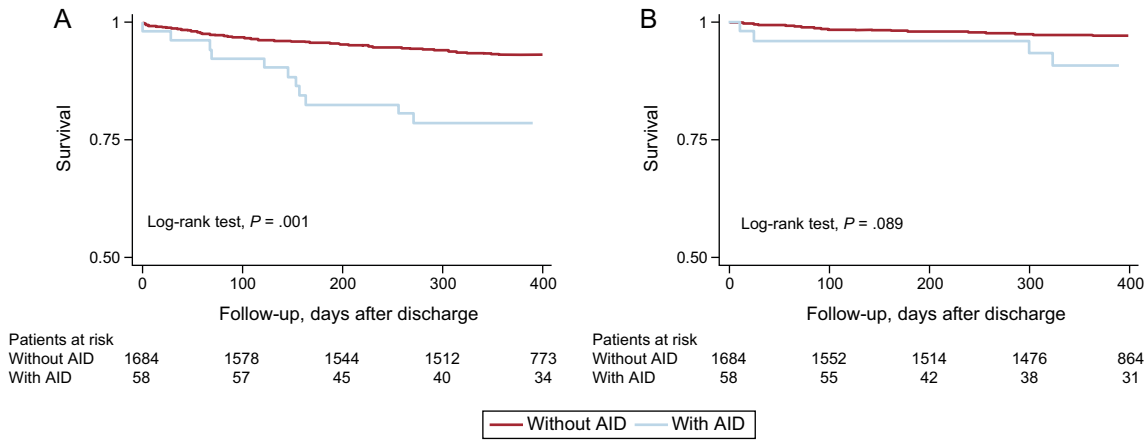

Figure. Kaplan-Meier curves. Overall mortality (A) and major bleeding (B) after discharge according to presence of autoimmune diseases (AID).

treatment and clinical presentation. These patients are also vulnerable to bleeding. Recently, it has been shown that a combination of traditional risk factors, atherosclerotic load, and extent of coronary artery disease can identify patients at long-term risk after ACS, but the predictive power is moderate.[5] The risk of long-term bleeding risk is, on the other hand, is only weakly predicted.[6] In view of our results, autoimmune disease may be considered a comorbidity that can help in general stratification of our patients after ACS.

Given the limited number of patients with autoimmune disease, we pooled them together for analysis, and therefore this population comprised a heterogenous group. Another limitation of the study is that the specific treatment was recorded on admission for ACS but not in the preceding years, which would have better reflected the temporal relationship.

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Available online 14 April 2017

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http://dx.doi.org/10.1016/j.rec.2017.03.018
1885-5857/

Interhospital Transfer in Patients on ECMO Support. An Essential Tool for a Critical Care Network

Traslado interhospitalario en ECMO. Una herramienta imprescindible para la atención del paciente crítico en red

To the Editor,

Extracorporeal membrane oxygenation (ECMO) has proven effective for providing respiratory and circulatory support in patients with refractory cardiogenic shock or severe respiratory failure.[1] Formerly, this therapy was limited to certain tertiary hospitals performing transplants, but over the last few years, many centers have initiated ECMO programs. The development of new, more compact ECMO systems has enabled transport of critically ill patients in relative comfort, and in safer and more favorable hemodynamic conditions. The creation of mobile units with trained professionals that can provide on-site care, with stabilization and subsequent transfer to a specialized center, offers these patients a chance for survival.[2]

In October 2013, *Hospital Universitario de Salamanca* launched its ECMO program, which was extended to a mobile ECMO program starting in June 2014. We performed a retrospective analysis of patients hospitalized with ECMO support in our center. Since its implementation, 9 patients have undergone interhospital transfer with ECMO. The aim of this report was to evaluate the feasibility and safety of an interhospital transfer program using ECMO for critically ill patients. We describe the logistic problems, indications, and outcome of our series.

Our mobile ECMO program includes 2 scenarios. The first is transfer of a patient receiving ECMO from our hospital to a reference hospital for heart or lung transplant. In this case, the attending team is composed of a perfusionist, a physician, and a