Pérez-Sole N, *et al. Prognostic role of persistent angina after percutaneous revascularization in chronic coronary syndrome with altered angiography and stress CMR. Rev Esp Cardiol. 2024.*

SUPPLEMENTARY DATA

SUPPLEMENTARY METHODS

Technical aspects of vasodilator stress cardiovascular magnetic resonance (CMR) studies.

All patients were examined with a 1.5 T system (Sonata Magnetom, Siemens, Erlangen, Germany) in our institution CMR laboratory according to the previously established study protocol. [1]

Analysis of images was performed by 2 European Society of Cardiology-accredited cardiologists with > 15 years' experience in the use and interpretation of vasodilator stress CMR testing. In a core lab and single CMR facility located in our university hospital they performed and quantified all outpatient CMR studies requested by specific outpatient clinics covered by our clinical department.

Images were acquired by a phased-array body surface coil during breath-holds and were triggered by electrocardiography.

Cine images were acquired in 2-, 3-, and 4-chamber views, and in short-axis views using a steady-state free precession sequence (repetition time/echo time: 2.8/1.2 ms; flip angle: 58 degrees; matrix: 256 × 300; field of view: 320 × 270 mm; slice thickness: 7 mm).

Vasodilatation was induced in most cases (327/334, 98%) with intravenous dipyridamole (0.84 mg/kg body weight over 6 minutes). Regadenoson (3/334, 1%) and adenosine (5/334, 1%) were used in a few cases of the study group. After administering a gadolinium-based contrast agent (gadopentetate dimeglumine or gadobenate dimeglumine at 0.1 mmoL/kg or gadoteric acid at 0.15 mmoL/kg) at least 3 slices in the short-axis view and 1 section in the long-axis views were acquired for hyperemia first-pass perfusion imaging using a gradient-echo sequence (inversion time: 90 ms; effective repetition time/echo time: 182 ms/1 ms; flip angle: 12º; matrix: 192 × 96; field of view: 400 × 300 mm; slice thickness: 8 mm).

Late gadolinium enhancement (LGE) imaging was performed 10 minutes after administering the gadolinium-based contrast agent in the same locations as in the cine images, using a segmented inversion recovery steady-state free precession sequence (effective repetition time/echo time: 750

ms/1.26 ms; flip angle: 45º; matrix: 256 × 184; field of view: 340 × 235 mm; slice thickness: 7 mm). Inversion time was adjusted to nullify normal myocardium.

CMR data analysis

Images were examined by 2 experienced cardiologists using customized software (Syngo, Siemens, Erlangen, Germany). If necessary, both operators subsequently evaluated the studies and the final results were adjudicated by consensus.

LVEF (%), LV end-diastolic volume index (mL/m^2), LV end-systolic volume index (mL/m^2) and LV mass index (g/m^2) were calculated by manual planimetry of endocardial and epicardial borders in short-axis view cine images.

Using the 17-segment model[2], 2 segmental postcontrast CMR indices were visually defined, as detailed below.

1. Ischemic burden: A segmental perfusion defect was defined as a persistent delay (in at least 3 consecutive temporal images compared with other segments in the same slice) during the myocardial first pass of the contrast agent after vasodilator infusion. The ischemic burden was defined by the number of ischemic segments showing perfusion defects in poststress imaging. The presence of a stress-induced perfusion defect was ruled out in segments exhibiting transmural LGE and those with simultaneous perfusion defect and nontransmural LGE in which the extent of the perfusion defect was not clearly greater than the extent of LGE. Only patients with > 1 ischemic segment were included in the study group.

2. LGE extent was visually defined as the number of segments manifesting LGE.

Inter- and intra-observer variability for all CMR indices used in the present registry is less than 5% and has been previously published.[1]

REFERENCES

Pérez-Sole N, *et al. Prognostic role of persistent angina after percutaneous revascularization in chronic coronary syndrome with altered angiography and stress CMR. Rev Esp Cardiol. 2024.*

1. Marcos-Garces V, Gavara J, Monmeneu JV, et al. Vasodilator stress CMR and all-cause mortality in stable ischemic heart disease: a large retrospective registry. *J Am Coll Cardiol Img.* 2020;13:1674–1686.

2. Cerqueira MD, Weissman NJ, Dilsizian V, et al. Standardized myocardial segmentation and nomenclature for tomographic imaging of the heart. A statement for healthcare professionals from the Cardiac Imaging Committee of the Council on Clinical Cardiology of the American Heart Association. *Circulation.* 2002;105:539–542.

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SUPPLEMENTARY RESULTS

Table 1 of the supplementary data. Dynamics of angina class.

Angina class	Inclusion n = 334	6 months n = 334	1 year n = 328	2 years n = 322	5 years n = 291
0	-	271 (81)	267 (81)	260 (81)	225 (77)
1	-	16 (5)	29 (9)	34 (10)	33 (11)
2	138 (41)	23 (7)	16 (5)	16 (5)	14 (5)
3	138 (41)	18 (5)	11 (3)	10 (3)	13 (5)
4	58 (18)	6 (2)	5 (2)	2 (1)	6 (2)

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Table 2 of the supplementary data. Competing-events.

	Number of patients	Weeks since previous event in patients with competing-events
Myocardial infarction + heart failure	2	243/0
Heart failure + myocardial Infarction	10	161/99/58/49/37/27/21/4/3/1
Myocardial infarction + cardiac death	3	25/0/0
Heart failure + cardiac death	8	122/90/68/3/3/3/2/0
Myocardial infarction + heart failure + cardiac death	3	11/6/1

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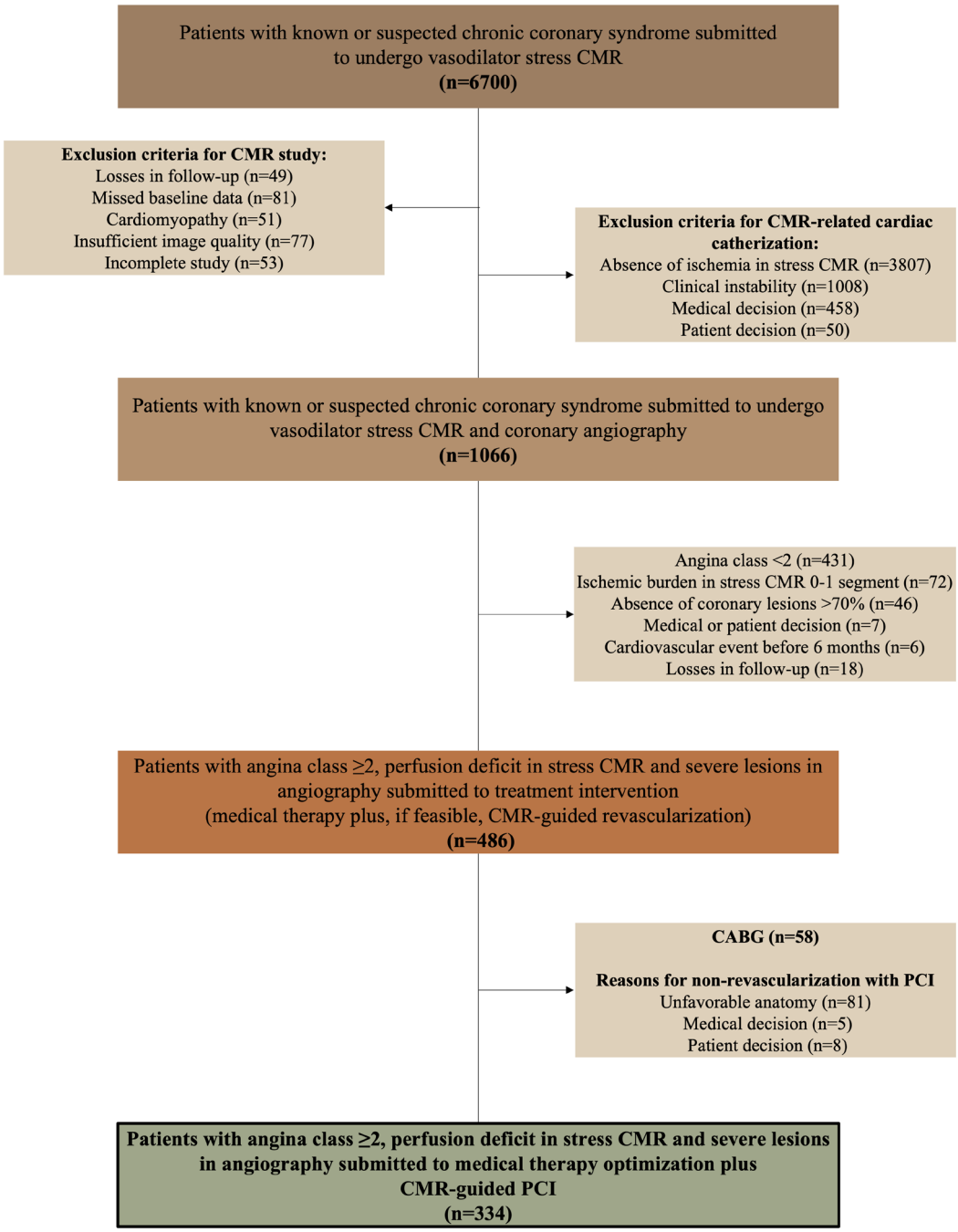
Figure 1 of the supplementary data. Patient flowchart.



CABG, coronary artery bypass grafting; CMR, cardiovascular magnetic resonance; PCI, percutaneous coronary intervention.

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Correcciones a la figura
Cambiar “submitted to undero” a “who underwent” (x 3)
Poner espacio a ambos lados de “=”
Cambiar “Losses in” a “Losses to” (x 2)
Cambiar “Missed baseline” a “Missing baseline”
Cambiar “ischemia in stress” a “ischemia on stress”
Cambiar “burden in” a “burden on”
Cambiar “non-revascularization” a “nonrevascularization”
Cambiar “lesions in angiography submitted to” a “lesions on angiography who underwent”

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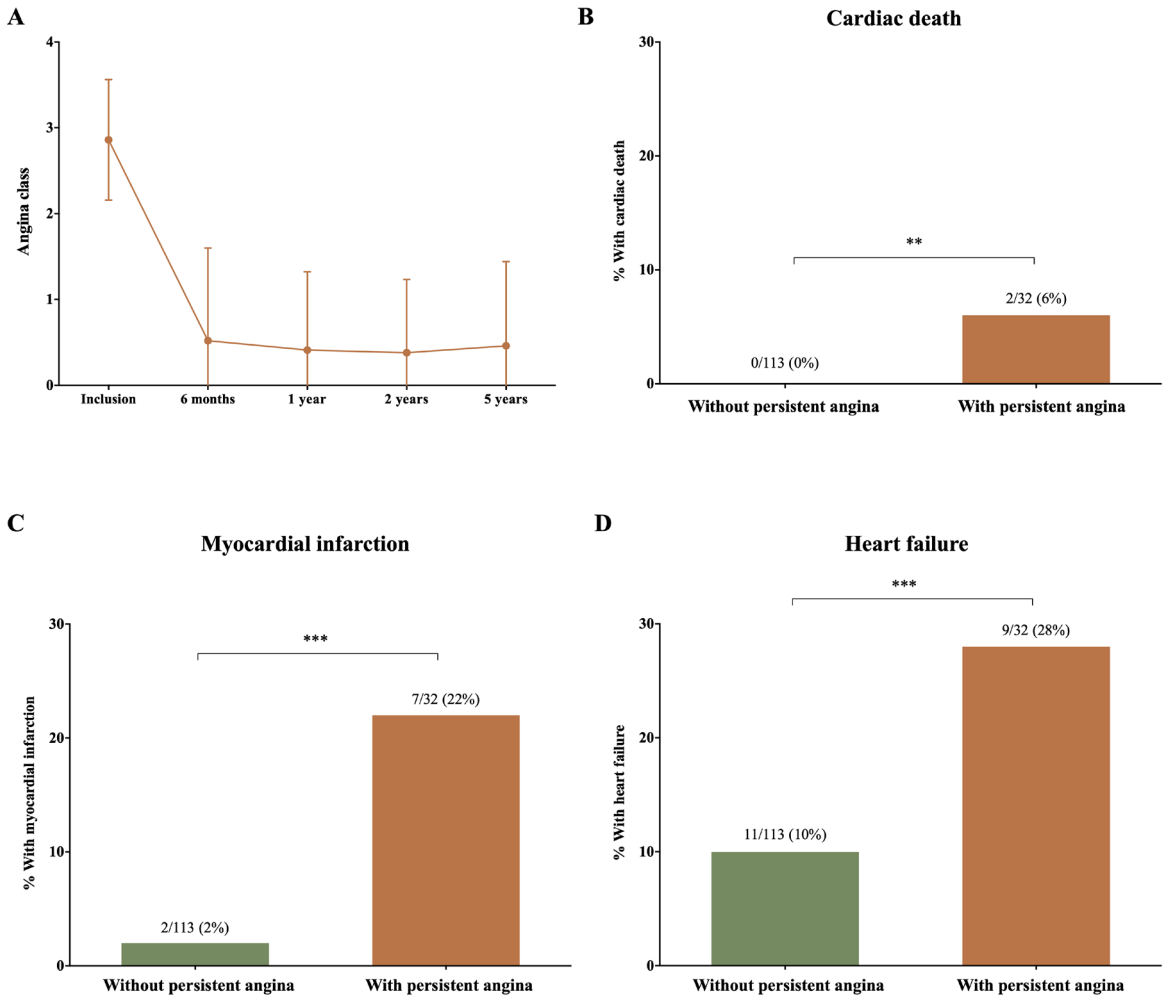
Figure 2 of the supplementary data. Dynamics of angina class and association between persistent angina and cardiac events in patients enrolled within the last 5 years of the inclusion period.



A: after intervention, a marked and sustained decrease in angina class occurred. Persistent angina (angina class ≥ 1 at 6 months after intervention) was associated with a higher rate of subsequent cardiac events during follow-up (B: cardiac death; C: myocardial infarction; D: heart failure).

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Figure 3 of the supplementary data. Dynamics of angina class in male and female patients. After intervention, a marked and sustained decrease in angina class (A) and an increase in the percentage of patients with angina resolution (B) occurred in the entire study cohort in both sexes.

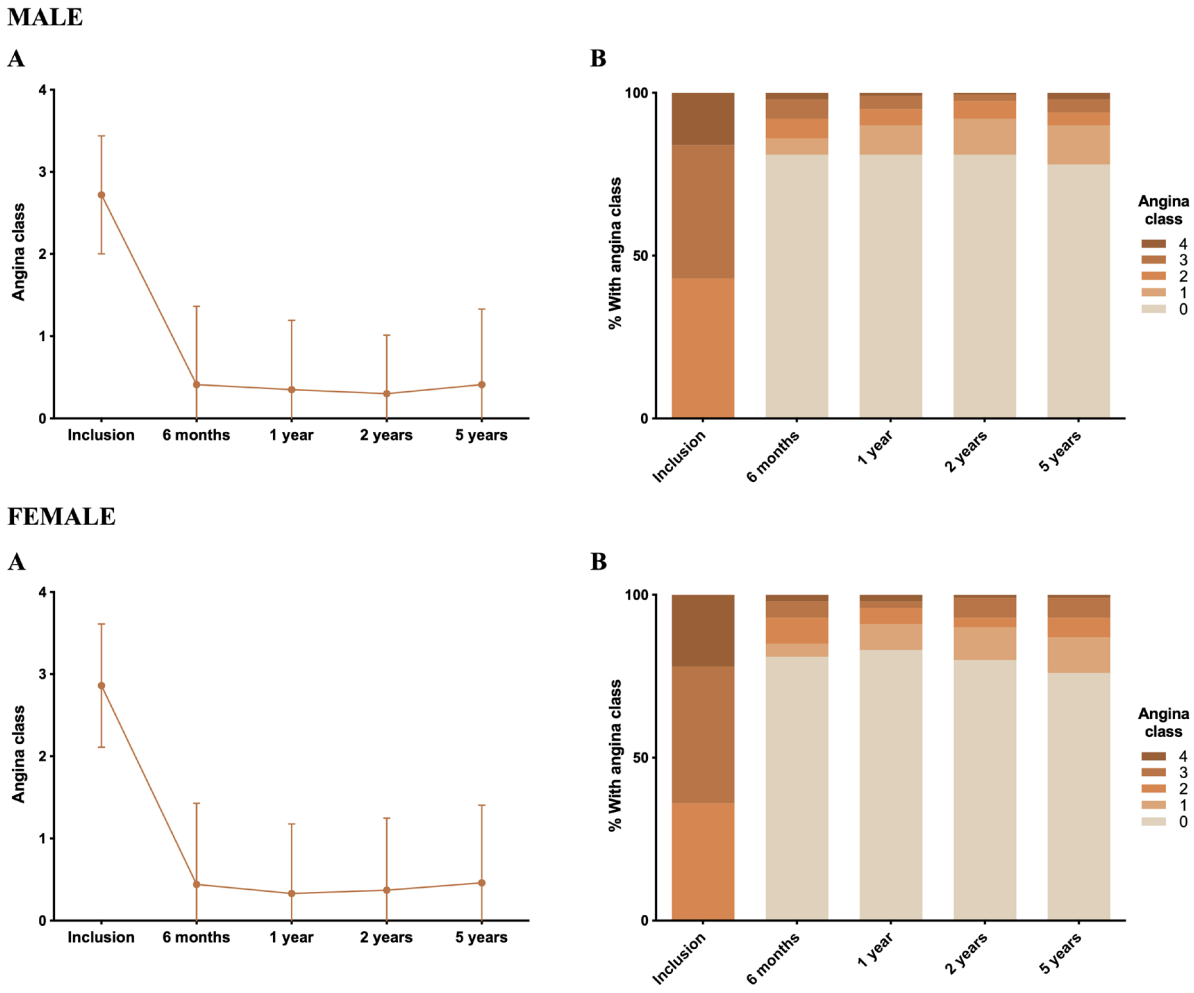

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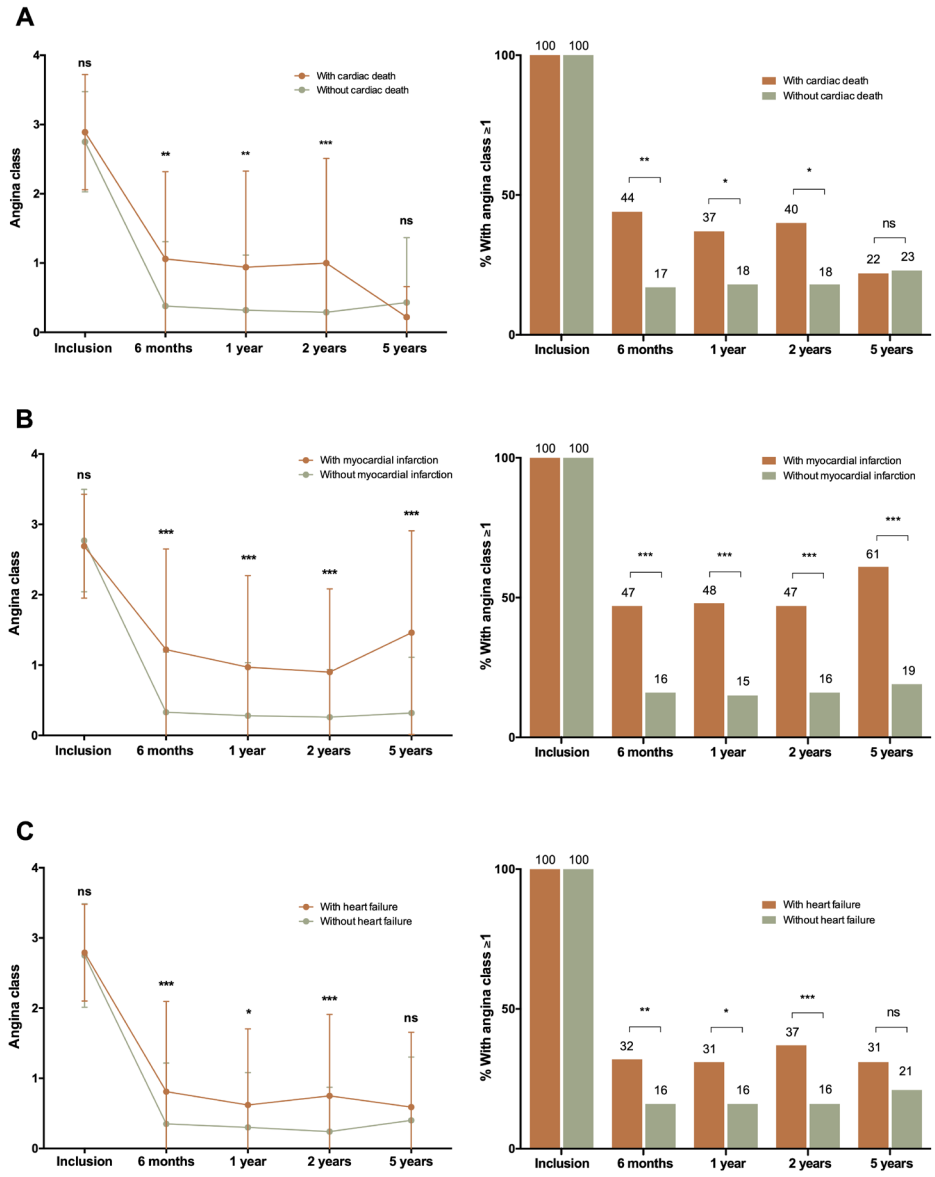
Figure 4 of the supplementary data. Dynamics of angina. Association with the occurrence of cardiac events.



Patients with cardiac events during follow-up (A: cardiac death; B: myocardial infarction; C: heart failure) showed higher angina class and more persistent angina (angina class ≥ 1) after intervention. (*P < .05, **P < .01, ***P < .001).