

Stress perfusion CMR provides strong long-term prognostic value to cardiac events irrespective of patient sex

T. Pezel¹, F. Sanguinetti², M. Kinnel², V. Landon², P. Garot², T. Hovasse¹, T. Untersee², S. Champagne², Y. Louvard², M.C. Morice², J. Garot²

¹Institut Cardiovasculaire Paris Sud, Paris, France; ²Cardiovascular Institute Paris-Sud (ICPS), Department of Cardiovascular Imaging, Massy, France

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Background: Compelling evidence indicates that women with coronary artery disease (CAD) experience worse outcomes than men due to a lack of early diagnosis and management. Numerous clinical studies have shown that stress cardiovascular magnetic resonance (CMR) detects evidence of myocardial ischemia and infarction at high accuracy. However, long-term prognosis data are limited.

Purpose: The aim of this study was to test the hypothesis that stress perfusion CMR imaging can provide robust prognostic value in women presenting with suspected ischemia, to the same extent as in men.

Material: Consecutive patients referred for vasodilator stress perfusion CMR with dipyridamole were followed for the occurrence of major adverse cardiovascular events (MACE) defined as cardiovascular death or non-fatal myocardial infarction (MI). The secondary endpoint was cardiovascular death. The safety of the CMR was assessed by clinical monitoring for 1 hour after the end of the CMR. Univariable and multivariable Cox regressions for MACE were performed to determine the prognostic value of inducible ischemia or late gadolinium enhancement (LGE) by CMR in each sex.

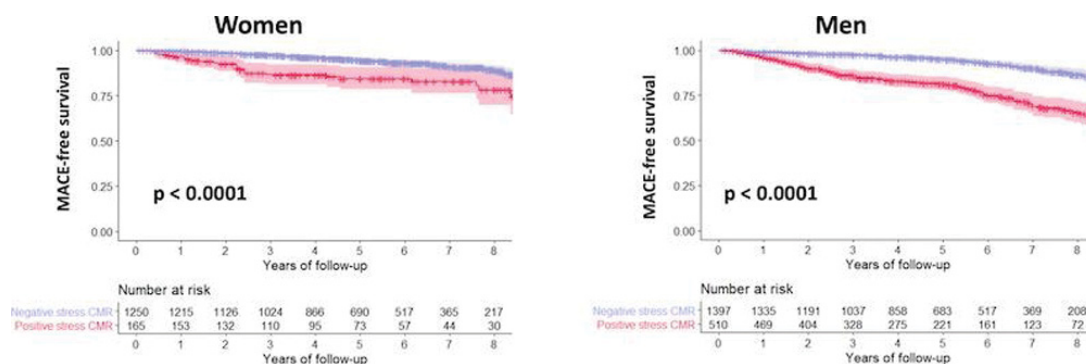
Results: Of 3436 patients referred for stress CMR in a single French center, 3322 (97%) completed the CMR protocol (59.9±11.8 years, 57% men), and among those 3033 (91%) completed the follow-up (median follow-up 5.4±0.2 years). Reasons for failure to complete CMR included renal failure

(n=29), claustrophobia (n=26), poor gating (n=22), intolerance to stress agent (n=19) and declining participation (n=18).

Stress CMR was well tolerated without occurrence of death or severe disabling adverse event. Using Kaplan-Meier analysis, the presence of inducible myocardial ischemia identified the occurrence of MACE for both women (hazard ratio HR 2.36; 95% confidence interval CI: 1.54–3.62; p<0.001) and men (HR 3.57; 95% confidence interval CI: 2.75–4.64; p<0.001) (Figure). Moreover, inducible ischemia was associated with cardiovascular death for both women (hazard ratio HR 1.92; 95% confidence interval CI: 1.12–2.74; p=0.04) and men (HR 2.71; 95% confidence interval CI: 1.98–4.41; p<0.001).

In a multivariable stepwise Cox regression including clinical characteristics and CMR, presence of inducible ischemia was an independent predictor of a higher incidence of MACE for both women (hazard ratio HR 1.85; 95% confidence interval CI: 1.18–2.92; p=0.008) and men (HR 3.55; 95% confidence interval CI: 2.73–4.63; p<0.001). Moreover, inducible ischemia was associated with cardiovascular death for men (HR 1.99; 95% confidence interval CI: 1.65–3.01; p<0.01) but not for women (p=0.11).

Conclusion: Stress CMR is feasible, safe and has a good discriminative prognostic value to predict the occurrence of MACE in patients of either sex presenting with inducible ischemia. However, inducible ischemia is an independent predictor of a higher incidence of CV mortality only in men.



Kaplan-Meier curves for MACE in each sex