Cardiac Magnetic Resonance for Excluding Coronary Artery Disease in Left Ventricular Dysfunction: The CAMAREC Study

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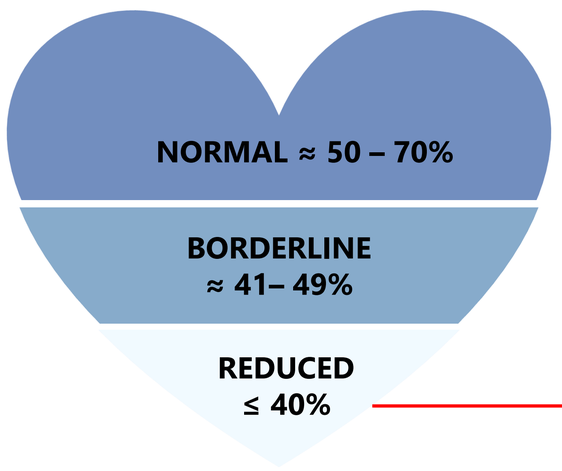
BACKGROUND

The left ventricular ejection fraction (LVEF) = % of blood the left ventricle is able to eject with each heartbeat to the entire body.



The Primary cause is **Coronary Artery Disease (CAD)**

How to detect it ?

First Echocardiogram

but without an obvious etiology

Second Coronary Angiography (CA)

Gold standard

- **The role of CA** in diagnosing CAD in **reduced LVEF (rLVEF)** patients **is being re-evaluated**, with guidelines questioning its routine use.
- CA is **an invasive procedure** that can **detect 30 to 60% of CAD.**

Recent **studies** reported the **high sensitivity of cardiac magnetic resonance (CMR)** in identifying significant CAD.

OBJECTIVES

To assess the diagnostic performance of CMR to predict significant CAD in patients with unexplained rLVEF, and the efficiency of a simulated CMR-first strategy.

METHODS

Study design Prospective, multicenter cohort study, across **ten French centers.**

Population **Adults** (≥18 years) with **new unexplained rLVEF** (≤45%)

Outcomes **Primary endpoint :** the sensitivity of the presence of ischemic scar on CMR (**CMR+**) for the diagnosis of significant CAD on CA (**CA+**).
Secondary endpoints :
specificity, positive predictive value, and negative predictive value of CMR for predicting CA+ patients.

Economic Evaluation

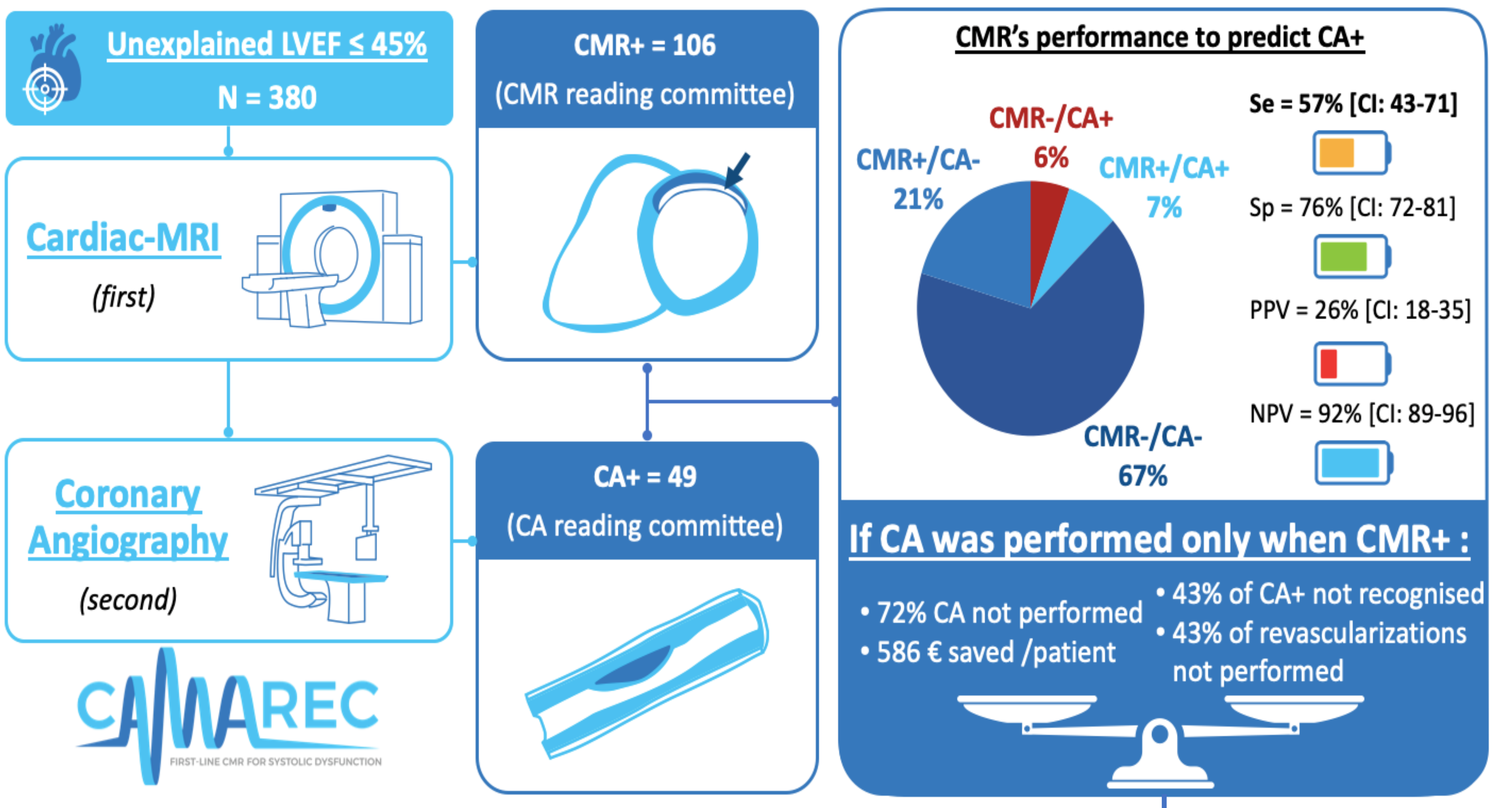
We **compared CMR triage versus angiography as first line diagnostic strategies** by simulating the proportion of patients for whom CMR can rule out disease and the proportion of patients for whom confirmatory angiography is required, where CMR is an addition to angiography.

Costs From a **healthcare perspective** in the French setting, using hospital costs and national tariffs as a proxy for the production costs of medical procedures.

Effectiveness The efficacy endpoint was **diagnostic accuracy**, defined as the proportion of patients correctly classified with or without significant CAD.

Cost-effectiveness Incremental cost-effectiveness ratio (ICER) was calculated as the cost difference divided by the diagnostic accuracy difference.

RESULTS

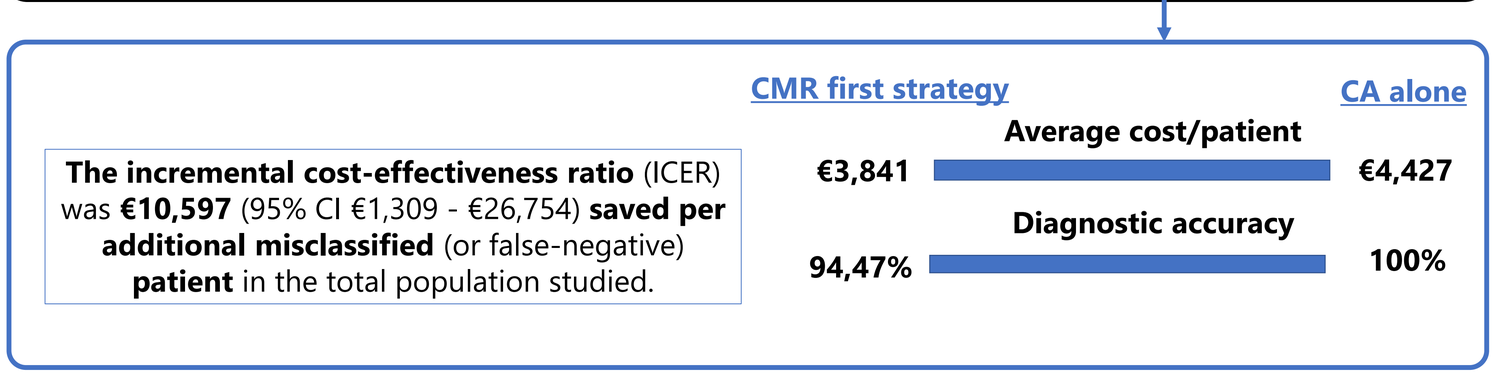


Se = Sensitivity Proportion of positive cases that are correctly detected by CMR

NPV = Negative Predictive Value Proportion of true negatives among detected negatives

PPV = Positive Predictive Value Proportion of true positives among detected positives

Sp = Specificity Proportion of negative cases that are correctly detected by CMR



The incremental cost-effectiveness ratio (ICER) was **€10,597** (95% CI €1,309 - €26,754) **saved per additional misclassified** (or false-negative) **patient** in the total population studied.

LIMITATIONS

Comparison Issues **Cost Analysis Gaps** **Sample Size** **Generalizability**

CONCLUSION

- While resting CMR offers diagnostic and cost advantages, the CAMAREC study highlights its limitations in ruling out significant CAD in rLVEF patients.
- This does not diminish CMR's clinical value but underscores the need for an integrated assessment strategy.
- A combined approach, including both myocardial and coronary evaluation—whether invasive or non-invasive—is essential in the initial evaluation of rLVEF.

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