

**Incidence and Prognostic Implication of Unrecognized Myocardial Scar  
Characterized by Cardiac Magnetic Resonance in Diabetic Patients  
Without Clinical Evidence of Myocardial Infarction**

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**Review**

More than 200 million people worldwide have diabetes. The estimated prevalence for 2025 surpasses the 300 million mark [1].

Approximately 80% of diabetics die of cardiovascular disease [1] and in general tend to have more extensive atherosclerosis with a higher prevalence of diffuse disease, more frequent silent myocardial ischemia, and a higher cardiac event rate than non-diabetic individuals [2–4]. The role of enhanced risk stratification using non-invasive imaging studies in asymptomatic diabetic subjects remains a controversial issue. Although current guidelines by the ADA suggest that only those individuals with multiple cardiovascular risk factors should undergo further diagnostic work-up, several recent studies have shown that the burden of traditional risk factors does not accurately predict inducible ischemia on nuclear or echocardiographic myocardial stress imaging [5–7]. Furthermore, to date, there is little evidence on how the presence of occult CAD as well as silent myocardial ischemia affect the prognosis in patients with diabetes mellitus.

Late gadolinium enhancement (LGE) imaging by cardiac magnetic resonance can provide sensitive characterization of myocardial scar, however, its prognostic significance in diabetic patients without any clinical evidence of MI is absent. This month's "ASCI's Choice" chose Kwong et al's study in which they assessed the incidence and prognostic implication of unrecognized myocardial scar characterized by cardiac magnetic resonance in diabetic patients without clinical evidence of myocardial infarction.

In a series of diabetic patients who underwent clinically indicated CMR imaging, LGE by CMR was present in 28% in patient without evidence of clinical evidence of myocardial infarction. Patients with LGE demonstrated a 4-fold hazards increase for MACE (death, acute MI, new congestive heart failure or unstable angina, stroke, and significant ventricular arrhythmias) at a median follow-up of 17 months. In addition, the presence of LGE was the strongest

multivariable predictor of MACE and death by stepwise selection in this patient population. They concluded CMR imaging can characterize occult myocardial scar consistent with MI in diabetic patients without clinical evidence of MI. This imaging finding demonstrates strong association with MACE and mortality hazards that is incremental to clinical, ECG, and left ventricular function combined.

This study suggests a possibility that LGE imaging can be used to detect a presence of myocardial scar that represented “footprints” of prior subclinical coronary events. These occult myocardial scars were associated with a high risk of future cardiac events and therefore identify a subpopulation of diabetic patients who may benefit from more intensive medical or revascularization treatment strategies.

Although a clear need exists to identify diabetic patients at high risk of cardiovascular events, so far it remains a controversial issue which modality could be used to identify a high risk patients in a cost-effective manner. Other imaging techniques also have reported value for risk stratification of diabetic patients without prior MI [8,9].

However, proactive screening, irrespective of the imaging modality used, in asymptomatic pre-diabetes and diabetes individuals might be essential to identify those who may have a higher cardiovascular mortality. Further studies will guide us with respect to which imaging modality is more appropriate.

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