糖尿病患者の非侵襲的リスク同定

心臓磁気共鳴画像により糖尿病患者の主要な有害心臓イベントを予測することができる

Cardiac magnetic resonance imaging predicts major adverse cardiac events in diabetic patients

糖尿病患者の主要な有害心臓イベント（MACE）は心臓磁気共鳴（CMR）画像により予測できるとESC 2009で発表された。この前向きスタディは狭心症で来院しCMRアデノシン灌流およびガドリニウム遅延造影（LGE）画像検査を施行された糖尿病患者170人を対象とした。164人（男性101人および女性63人）において良質のCMR画像が撮影でき追跡調査が可能であった。これら164人の患者は臨床的に心筋梗塞歴のないスタディ群（114人）および心筋梗塞の既往のあるコントロール群（50人）に分割した。追跡調査中央値26ヵ月後に心筋灌流欠損およびLGE陽性の者が32%（114人中36人）存在し、26%（114人中30人）がMACEを経験した。MACEを経験した者は有意に高齢であり、過去に冠動脈血行再建術を施行された率が高く、CMRで評価した左室駆出率が低かった（それぞれp=0.03；p=0.05およびp=0.03）。LGEが存在することによりMACEのハザード比がLGEの存在しない場合と比較し3.5倍増大した（HR 3.5；p=0.01）。心筋灌流欠損によりMACEのハザード比が2.5倍増大した（HR 3.1；p=0.04）。

Full Text

Major adverse cardiac events (MACE) can be predicted by cardiac magnetic resonance (CMR) imaging in patients with diabetes according to a study presented at the 2009 ESC Congress.

Cardiac magnetic resonance imaging provides a noninvasive means to predict moderate to high risk of cardiac events in diabetic patients. It also detects silent myocardial ischemia, according to the results of a study conducted in Hong Kong, where 7.7% of the population is affected by diabetes. Late gadolinium enhancement (LGE) presence was associated with an increase in cardiac events, including death.

As cardiovascular complications are now the leading cause of illness and death in diabetic patients, the burden of cardiovascular disease and premature mortality is expected to rise correspondingly, accounted for an estimated 50% to 80% of all deaths in those with diabetes mellitus (DM). Unfortunately, it has been reported by Rosenmann that a larger population of diabetic patients has asymptomatic myocardial infarction, estimated to be 9.1% compared with only 4.1 % of silent myocardial infarction in non-diabetic patients and patients with silent myocardial infarction are doing worse. There is a clear need to identify diabetic patients at high risk of cardiovascular events who may benefit from more intensive medical or revascularization treatment strategies.

The prevalence of diabetes mellitus has increased tremendously over the past decades. Estimates from the World Health Organization predict that by the year 2015, 300 million people around the world will be diagnosed with diabetes. The Asian/Pacific region accounts for 46% of the global burden of diabetes and China is estimated to contribute almost 38 million people to the diabetic population in the year 2025. The age-adjusted prevalence of diabetes mellitus in Hong Kong was found to be 7.7% whereas the crude prevalence ranged from less than 1% in subjects younger than 30 years to more than 20% in the middle-age group.

Cardiac magnetic resonance imaging (CMR) provides a noninvasive means of comprehensive assessment in myocardial perfusion reserve, to detect myocardial ischemia and characterization of myocardial scar by late gadolinium enhancement (LGE) imaging in a one-stop shop fashion.

Silent myocardial infarction in diabetic patients identified by late gadolinium enhancement by contrast enhanced cardiac magnetic resonance imaging, is the strongest incremental prognostic factor for the development of future major adverse cardiac events (MACE).

This prospective study consisted of 170 diabetic patients presenting with angina who underwent CMR adenosine perfusion and LGE imaging. Good quality CMR imaging and follow up were successful in 164 patients (101 male and 63 female). The 164 patients were divided into the study group (n=114) that consists of patients without clinical history of myocardial infarction and the control group (n=50) with a past history of myocardial infarction. Cox regression analyses were performed to associate the presence of myocardial ischemia by positive adenosine perfusion study and LGE with major adverse cardiovascular events (MACE), including cardiovascular death, occurrence of new myocardial infarction, unstable heart failure requiring hospitalization, significant ventricular arrhythmic events and unstable angina between the study group and the control group respectively.

At a median follow-up of 26 months, positive myocardial perfusion defect and LGE was present in 32% (36 of 114 patients) and 26% (30 of 114 patients) experienced MACE respectively. Patients with MACE were significantly older, had more prevalence of having previous coronary revascularization procedures and lower left ventricular ejection fraction as assessed by CMR (p=0.03; p=0.05 & p=0.03 respectively).

The presence of LGE was associated with a 3.5 fold hazards increase for MACE (hazard ratio, 3.5; p=0.01) compared with patients without LGE. The presence of perfusion defect was associated with a 2.5 fold hazards increase for MACE (hazard ratio, 3.1; p=0.04). Adjusted with other clinical risk factors including age, left ventricular ejection fraction and myocardial perfusion imaging, LGE was the strongest multivariable predictor of the development of MACE.

Furthermore, diabetic patients without history of myocardial infarction but silent myocardial infarction identified by positive LGE had a cardiac event rate similar to that of patients with clinical evidence of prior MI.

These results have further proven the hypothesis that diabetic patients with silent myocardial infarction are a high risk population for future MACE and justify more intensive management strategy.

In conclusion, cardiac magnetic resonance imaging provides a noninvasive means to identify moderate to high-risk diabetics. It detects silent myocardial ischemia by adenosine myocardial perfusion and identifies silent myocardial infarction. LGE by CMR provides incremental value in the risk stratification model in diabetic patients that is complementary to other well known risk factors model.

Conference News