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MYOCARDIAL ISCHEMIA DETECTION IN DIABETIC PATIENTS

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Annotation

The combination of clinical coronary artery disease and diabetes mellitus is a harbinger of adverse outcome. Recently, in a jointly issued statement, the American Diabetes Association, the National Heart, Lung, and Blood Institute, the Juvenile Diabetes Foundation International, the National Institute of Diabetes and Digestive and Kidney Diseases, and the American Heart Association indicated the importance of diabetes mellitus as a major risk factor for cardiovascular disease. Patients with diabetes mellitus often have premature coronary artery disease; the disease is often asymptomatic and in an advanced stage when detected. In general, the outcome of patients with diabetes mellitus is poorer than those without diabetes, and coronary artery disease in the diabetic patient may be less amenable to favorable interventional treatment compared with the nondiabetic population.

Keywords: patients, diabetic, disease, stress, echocardiography, asymptomatic.

Diabetic patients have significantly higher rates of silent ischemia and silent myocardial infarction (MI) than the general population. Exercise electrocardiography (ECG) testing is a well-established and inexpensive test to guide the clinician in the diagnosis and risk stratification of diabetic patients with suspected CAD. Sensitivity and specificity for the diagnosis of CAD in diabetic and nondiabetic patients who present with angina appear comparable. In asymptomatic patients, an abnormal exercise ECG test may be helpful to identify a subgroup of patients with advanced CAD. Patients with a negative stress test in the presence of normal exercise capacity are at low risk for CV events, at least in the short run. Stress nuclear imaging has the most extensive literature among the noninvasive modalities for both diagnostic and prognostic purposes in diabetes. With respect to stress echocardiography, several studies have addressed its



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prognostic accuracy in diabetes, although the data on its diagnostic value are scarce.

Stress radionuclide myocardial perfusion imaging (MPI) is used widely to evaluate patients with suspected or known coronary artery disease. A large body of evidence attests to the high diagnostic yield of stress MPI and its important incremental prognostic value over both clinical and angiographic variables for the prediction of major acute coronary events. The degree and extent of myocardial perfusion abnormalities observed on stress MPI are related directly to outcome. The greater the myocardial perfusion abnormality, the greater the likelihood of future cardiac events. On the other hand, unequivocally normal stress MPI is associated with an excellent outcome and a cardiac event rate of <1% per year. Several investigators have reported that single-photon emission computed tomography (SPECT) MPI had similar prognostic value in patients with diabetes mellitus.

The assessment of coronary artery calcium is a well-established index of atherosclerosis. Electron beam computed tomography (CT) and multidetector CT (MDCT) enable measurement of the calcium content of coronary arteries, and a scoring system has been developed for that purpose. Several studies have identified coronary artery calcium score as a strong predictor for CV events and all-cause mortality in diabetic individuals. The Prospective Evaluation of Diabetic Ischaemic Disease by Computed Tomography (PREDICT) study evaluated calcium score as a predictor of CV events in 589 asymptomatic individuals with type 2 diabetes prospectively. The risk of a CV event increased with increasing category of calcium score. In addition, calcium score had greater predictive value for end points than a broad range of conventional and novel risk factors. Finally, a prospective cohort study in West London found that calcium score was superior to established risk factors in predicting the presence of silent myocardial ischemia on perfusion.

The value of screening for CAD in asymptomatic diabetic patients is a source of controversy. Cardiac testing should be considered in the presence of additional features of increased CV risk, such as peripheral or cerebrovascular disease, renal disease, albuminuria, abnormal resting ECG, microvascular diabetic complications, or additional CV risk factors.



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In conclusion, although stress testing should be performed at a lower suspicion of CAD in patients with diabetes, compared with their nondiabetic counterparts, and in those with associated high-risk conditions, a routine screening for CAD in asymptomatic patients is not justified.

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