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Cardiac risk stratification in people with asymptomatic diabetes

It is estimated that there are approximately 200 million individuals with diabetes worldwide, with projection of this prevalence to exceed 300 million by 2025. Over 90% of these people have type 2 diabetes. Current management guidelines consider type 2 diabetes as a cardiovascular disease equivalent, on the grounds of a previously recorded two- to four-fold higher risk of cardiovascular events than people without diabetes. Of course, cardiovascular death is the most common cause of mortality in type 2 diabetes. Accordingly, better cardiovascular risk stratification in people with type 2 diabetes would be appropriate. However, this can be difficult since the presentation and progression of ischaemic heart disease varies in people with and without diabetes. Indeed, people with diabetes will have more diffuse, calcified and extensive coronary artery disease and more often have left ventricular dysfunction at the time of diagnosis (Hammoud et al, 2000). Indeed, more people with diabetes experience silent ischaemia. Consequently, appropriate and accurate diagnosis of cardiovascular risk is required, together with appropriate assessment of prognosis.

Many people with diabetes and coronary artery disease are asymptomatic or present with atypical symptoms (Nesto et al, 1988). Utilising a variety of imaging assessment methodologies, various studies have reported anywhere between 21 and 59% abnormalities on investigations, suggesting the presence of coronary artery disease in asymptomatic individuals (Bax et al, 2007). These figures would of course relate to different patient populations with differing durations of disease and additional risk factors. Thus, the question arises as to whether or not asymptomatic people with diabetes should undergo screening for coronary artery disease. This field has been intensively argued. The current American Diabetes Association (ADA) consensus guidelines for screening of asymptomatic people recommends stress imaging in those with abnormal resting electrocardiograms, but not in people who may, for example, have cerebral/peripheral vascular disease or two or more cardiovascular risk factors (ADA, 1998). In the latter category of individuals, the ADA consensus guidelines would suggest an exercise ECG. Additionally, it is clear that in people with an abnormal ECG, nuclear imaging and stress echocardiography may not be the ideal screening tools in terms of cost-effectiveness.

The increasing use of coronary artery calcium scoring with computer tomography techniques may assist planning for further investigations. For those individuals who demonstrate extensive coronary artery calcium, nuclear imaging with SPECT may be utilised to detect the presence or absence of ischaemia. Thus, people with a calcium score of >400AU may be offered SPECT analysis. For those with moderate calcium scores (100–400AU), imaging with SPECT may depend on the presence of other comorbidities, such as prolonged duration of diabetes or the presence of microvascular complication additional factors that elevate risk. Demonstration of moderate-to-severe ischaemia on SPECT may thereafter suggest a progression to angiography. Less definitive investigations may require an appropriate evaluation by a cardiologist.

Clearly, the basis for such a step-wise screening approach is dependent on fulfilling the criteria for screening. These would include the high prevalence of the disease, accuracy of a screening test in respect to identifying low- and high-risk groups, treatment of high-risk groups establishing an improvement in outcomes and, finally, the entire screening strategy should be cost effective. Currently, there are no data available fulfilling the latter criteria of the screening process. Consequently, large-scale study of evaluation of coronary artery disease in asymptomatic people with diabetes is required urgently.

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Coronary artery calcium scoring: A solution to successful risk stratification in people with asymptomatic diabetes?