

Diabetes and the Risk of Heart Attacks



Studies show that people with diabetes are two to four times more likely to have a heart attack than those without diabetes. Associate Professor Tan Huay Cheem, Director, National University Heart Centre, Singapore (NUHCS), National University Health System, gets to the heart of the risks behind this condition.

1. Why is heart attack important in people with diabetes mellitus?

There has been a worldwide epidemic explosion in the number of people afflicted with diabetes mellitus (DM). The number of diabetic patients is expected to increase from 118 million in 1995 to 221 million by 2010, with the biggest increase witnessed in Asia. Singapore has about 250 000 patients diagnosed with DM.

Diabetes mellitus is an important risk factor for coronary artery disease (CAD). CAD is a condition where there is hardening of the coronary (heart) arteries (atherosclerosis) with resultant deposits of cholesterol and fat forming gunk or 'plaques' within the inner lining of the artery wall. Whenever there is breakage of the atherosclerotic plaque surface, blood clots form immediately which can block off the artery causing cessation of blood supply to the heart muscles, a condition named acute myocardial infarction (or heart attack). Heart attacks are potentially life-threatening with 40% of patients dying at the outset.

The prevalence of CAD in people with diabetes is high. The risk of CAD is increased two- to four-fold in diabetics compared with non-diabetics. It is estimated that 50% of patients with DM under the age of 65 years have CAD while those above the age of 65 have a CAD prevalence rate of 75%. The occurrence of CAD is related to the duration of the DM. Diabetics tend to develop CAD that are more severe and at an earlier age. People with diabetes have also higher incidence of heart failure and fatality rate following a heart attack. In fact, CAD accounts for 75% of eventual death among those with diabetes.

2. Why are people with diabetes at risk for heart attacks?

The state of high blood sugar in the blood (hyperglycaemia) have significant negative impact on the normal physiology of the blood vessels and body. Hyperglycaemia causes

impairment of function of the inner lining of the blood vessels (endothelial dysfunction), increase 'bad' cholesterol level and triglyceride (another fat component), increased tendency to form blood clots, damage to the kidneys, and interacts with other coronary risk factors such as smoking, hypertension to exacerbate the severity of CAD.

People with diabetes commonly have multiple coronary arteries that are diseased. The type of disease pattern is usually more complex with higher incidence of diffuse narrowing, complete occlusion of the vessel and calcification (deposits of calcium) of the narrowings. The rate of progression of CAD is accelerated in diabetics and accounts for their poor prognosis in the long run.



3. Is control of blood sugar enough to prevent heart attacks?

Control of hyperglycaemia is part and parcel of any cardiovascular prevention strategy. Studies have shown that lowering of blood sugar by 1% of HbA1c (glycated haemoglobin), a blood test which reflects the average level of blood sugar control in the preceding three months, can bring about significant reductions in any diabetes-related outcomes: diabetes-related death (21%), peripheral vascular disease (43%), microvascular disease such as those involving the eyes and kidneys (37%). The impact of mere blood sugar lowering in preventing risk of heart attacks is however low at about 14%, suggesting that prevention of heart attacks require other concurrent strategies.

4. What is the best way to prevent heart attacks and death in diabetics?

It is now known that prevention of heart disease in diabetics require a multi-pronged approach, incorporating behavioral modification, along with pharmacologic therapy that targets hyperglycaemia, hypertension, high cholesterol and microalbuminuria ('leakage of protein in the urine'); and secondary prevention with aspirin

therapy in high risk individuals. This may be likened to a 'total defense approach'. People with diabetes need to go on reduced-fat diet, regular exercise, smoking cessation counselling; and aggressive control of their risk factors with medications.

American Diabetes Association has the following recommendations: lowering of blood pressure to <130/80mmHg, lower low-density lipoprotein (LDL)-cholesterol or 'bad cholesterol' to <100mg/dL (2.6mmol/L), triglyceride to <150mg/dL (1.7mmol/L), increase high-density lipoprotein (HDL)-cholesterol or 'good cholesterol' to >40mg/dL and lower glycated haemoglobin (HbA1c) to <7%.

5. Should all diabetic patients be screened for possible blocked heart arteries?

Screening for CAD in asymptomatic diabetic patients is recommended in those with abnormal resting electrocardiogram (ECG), evidence of other vascular disease (such as previous stroke), has microalbuminuria or kidney impairment. As for the rest, intensive lifestyle modification and risk factor control remains the mainstay therapeutic approach in the prevention of heart disease.

