



## **Heart attack: how does it occur?**

A heart attack is a medical emergency. Its main symptom is pain, often severe, over a wide area and usually in the front and middle of the chest. The pain may also be present in the left (or right) arm, in the throat, in the back of the chest or in the neck or jaw. The pain is usually very unpleasant and threatening, coupled with a sense of pressure in or on the chest. Shortness of breath, sweating and nausea may also be present. It usually comes without apparent provocation by effort or stress. The pain usually persists over many minutes or some hours.

Heart attack occurs in people who have coronary artery disease, often unrecognised, but is also common amongst those who have angina pectoris (from Latin -strangling in the chest). With angina pectoris, pain comes with effort or stress and is eased by rest, and lasts only a few minutes.

Coronary artery disease occurs in the arteries running back along the surface of the heart, supplying blood to the heart muscle. These coronary arteries form a "crown" around the heart (Latin again). Coronary artery disease develops through the deposition of cholesterol in the walls of the arteries. These fatty deposits form plaques which may narrow the arteries in places. Cholesterol deposits are due to recognised "risk factors" (high blood cholesterol, high blood pressure, obesity and overweight, inactivity, smoking and diabetes). Most of us have at least one risk factor.

From time to time, a crack or fissure may occur in one of the plaques. This may heal or may not. If not, blood clotting may form on the plaque. The blood clot may then block the artery.

A blocked artery means that a portion of the heart muscle is deprived of blood supply. Some of that heart muscle may be damaged, either patchily (with only a few muscle cells dying) or a sizeable portion of heart muscle may be sufficiently deprived of blood supply so that it starts dying over the few hours from the onset of the chest pain.

This is where the emergency becomes critical. During the first few hours, the threatened portion of heart muscle can be saved, either in whole or in part. The blocked artery can be opened up by an intervention (coronary angioplasty) and held open by a metal mesh (a stent). Alternatively, thrombolytic (clot dissolving – Latin again) drugs may be given. Major medical centres now have facilities and rostered cardiologists around the clock to cover reception and management of people having heart attacks.

Heart attacks nowadays are referred to as "acute coronary syndrome" which may be a) acute myocardial infarction with specific changes in the electrocardiogram ("ST segment elevation") or b) acute myocardial infarction without changes in the electrocardiogram ("non ST segment elevation") or c) unstable angina where the occurrence of the heart attack with coronary occlusion is confirmed, but no loss of heart muscle cells is detected by blood tests. The three groups are related to the descending severity of the acute illness and may merit different treatment approaches. The conditions are well defined. The advances in management over the past decade have been enormous. Damage to heart muscle is greatly reduced.

But don't forget - it could all be avoided by changing your health behaviours and by medical management to prevent the development of coronary heart disease in the first place.

Dr Alan Goble  
Cardiology Consultant  
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