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CORONARY HEART DISEASE: CURRENT PERSPECTIVES

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ABSTRACT

Coronary heart disease (CHD) is currently the leading cause of death worldwide and together with diabetes, poses a serious health threat, particularly in the Indian Asian population. Risk factor management has evolved considerably with the continued emergence of new and thought-provoking evidence. The stream of laboratory and population-based research findings as well as unresolved controversies may pose dilemmas and conflicting impulses in most clinicians and even in our more well-informed patients. As results of the most recent clinical trials on glycaemic control for macrovascular risk reduction are woven into concrete clinical practice guidelines. Drugs with anabolic and immunomodulating properties are being evaluated and clinical and non-clinical trials. The major risk factors for developing heart disease are the same for both men and women. These include hypertension, cigarette smoking, hyperlipidemia, diabetes, obesity, stress, age, heredity and race.

KEYWORDS: Coronary Heart Disease, Diabetes, Hypertension and Hyperlipidemia.

INTRODUCTION

There are several different forms of cardiovascular (heart and blood vessel) disease. CHD is a long-term condition that is a common cause of death and disability. For a person with CHD, the blood vessels that carry oxygen and nutrients to the heart muscle are clogged and narrowed. If these vessels (the coronary arteries) become too clogged, the blood supply to the heart muscle is reduced, which can lead to symptoms such as angina (chest pain). If a blood clot forms in the narrowed artery and completely blocks the blood supply to part of the heart, it can cause a life-threatening heart attack.[1]

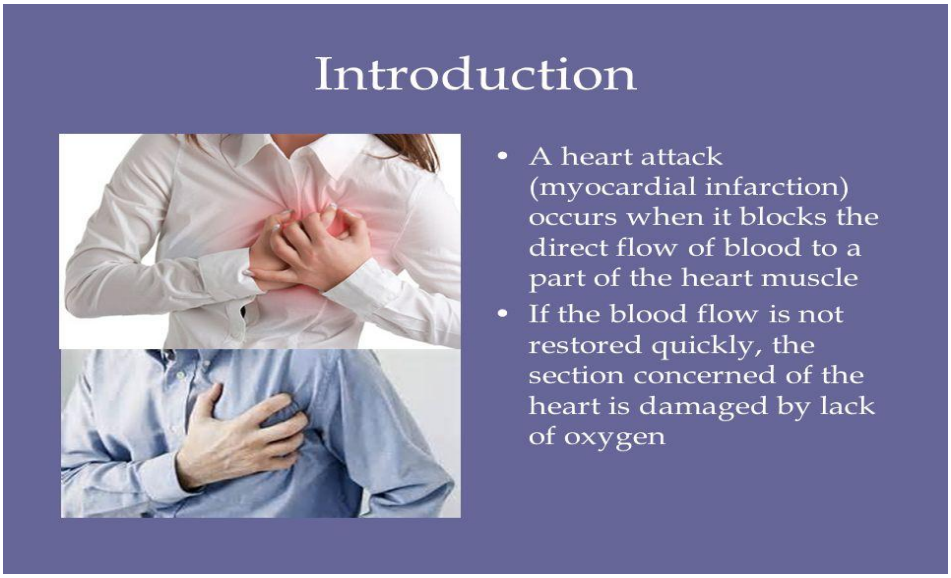


Figure 1: Heart Attack

Cardiovascular diseases (CVD), comprising coronary heart (CHD) and cerebro-vascular diseases, are currently the leading cause of death globally, accounting for 21.9 percent of total deaths and are projected to increase to 26.3 per cent by 2030.[2] The popularity of smoking, dyslipidaemia, obesity, diabetes and hypertension has been gradually rise[3] and is thought to be the driving influence behind the epidemic of heart disease faced today.

Of the risk factors, diabetes, and its predominant form, type 2 diabetes mellitus (T2DM), has a distinctive association with CHD. Those with diabetes have two- to four-fold higher risk of developing coronary disease than people without diabetes[4] and CVD accounts for an overwhelming 65-75 per cent of deaths in people with diabetes.[5],[6] More significantly however, the age- and sex-adjusted mortality risk in diabetic patients without pre-existing coronary artery disease was found to be equal to that of non-diabetic individuals with prior myocardial infarction (MI).[7]

Risk factors

Risk factors for the development of heart failure in the general population have been examined in the Framingham Heart Study and the Study of Men Born in 1913.[8]-[10] In the Framingham Study almost 20% of those suffering a myocardial infarction developed heart failure within 5-6 years.[11]

Diabetes alone may induce important structural and functional changes in the myocardium that increase the risk of heart failure. Body weight is also an independent risk factor for heart

failure[12], but interestingly, total cholesterol is not. A high total cholesterol to high density cholesterol ratio is, however, powerfully associated with an increased risk of heart failure presumably due to coronary heart disease. Cigarette smoking increases the risk of heart failure, possibly through the same mechanism, but the relationship becomes weaker with increasing age.[13]

Glycaemic control in cardiovascular risk reduction: an actively evolving example

In patients with diabetes, where excess CVD risk has already been demonstrated, the relationship between glycaemia itself and CVD should not, theoretically, be in doubt. Even studies in non-diabetic subjects[14,15], including a meta-regression analysis combining data from >95000 participants[16], have shown an association between fasting blood glucose and CVD.

Despite impressive reduction in microvascular complications[17]-[19] and retrospective cohort data showing lower risk of strokes (21%) and MI (23%)[20] with lower levels of glycaemia. Blood glucose management remains a vital component of preventing disabling and fatal target organ damage in both T1DM and T2DM.

This was confirmed in the 17 yr followup of the Diabetes Control and Complications Trial (DCCT)[21] where the intensively treated type 1 diabetes patients had 42 and 57 per cent lower risk of CVD events and death from CVD, respectively, despite no difference found at earlier follow-up.

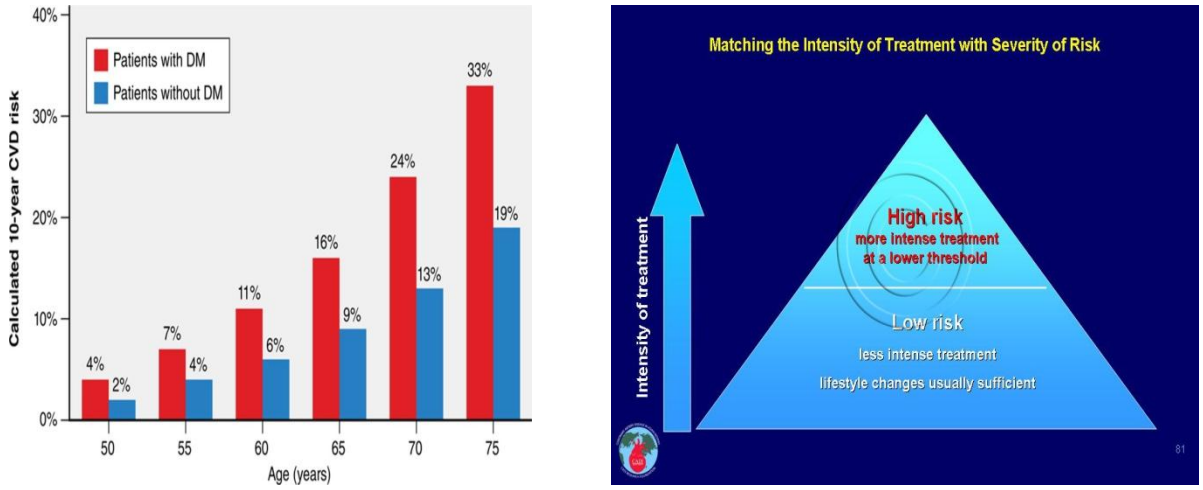
Risk prediction: Strengths and limitations

Use of risk prediction charts to estimate total cardiovascular risk is a major advancement on the older practice of identifying and treating individual risk factors, such as raised blood pressure (hypertension) and raised blood cholesterol (hypercholesterolemia).

Risk scores using the Framingham equations have been widely tested in North American and European populations of European origin[22]-[25] and validated in a Chinese population[26], but not in other populations. The European Guidelines on CVD prevention use a new model for total risk estimation based on the SCORE (Systematic Coronary Risk Evaluation) system. The risk estimation is based on sex, age, smoking, systolic blood pressure and either total cholesterol (TC) or the ratio of total cholesterol to high-density lipoprotein cholesterol (HDL-C).

Older age and male sex are powerful determinants of risk; consequently, it has been argued that the use of the risk stratification approach will favour treatment of elderly people and men, at the expense of younger people with several risk factors and women.

Total CVD risk (over 10 years) **Intensity of Treatment**



Goal of treatment: Reduction of total cardiovascular risk

Figure 2: Intensity of interventions should be proportional to the total cardiovascular risk

The WHO/ISH cardiovascular risk prediction

Some studies have suggested that diabetic patients have a high cardiovascular risk, similar to that of patients with established cardiovascular disease and so do not need to be risk-assessed. However, some people with diabetes, particularly younger patients and those who are newly diagnosed, have low or moderate total CVD risk. In addition, in people with diabetes, there is no gender difference in the risk of coronary heart disease and stroke.[27]

Goals of applying the prevention recommendations

The purpose of applying the recommendations elaborated in these guidelines is to motivate and assist high-risk individuals to lower their cardiovascular risk by:

- quitting tobacco use, or reducing the amount smoked, or not starting the habit;
- making healthy food choices;
- being physically active;
- reducing body mass index (to less than 25 kg/m^2) and waist–hip ratio (to less than 0.8 in women and 0.9 in men (these figures may be different for different ethnic groups);
- lowering blood pressure (to less than 140/90 mmHg);
- lowering blood cholesterol (to less than 190 mg/dl);

● lowering LDL-cholesterol (to less than 115 mg/dl);

● controlling glycaemia, especially in those with impaired fasting glycaemia and impaired glucose tolerance or diabetes;

● taking aspirin (75 mg daily), once blood pressure has been controlled.

Pharmacological management

Antiplatelet agents[28]

• All patients with CHD should take 75–150 mg/day of aspirin unless contraindicated.

• Clopidogrel can be taken instead of aspirin when aspirin is contraindicated.

• Clopidogrel should be considered in combination with aspirin in patients who have recurrent cardiac ischaemic events.

• Clopidogrel use carries an increased risk of bleeding during surgery.

Anticoagulants

• We recommend using warfarin in patients who have had an MI who are at high risk of systemic thromboembolism because of atrial fibrillation, mural thrombus or previous embolisation. It may sometimes be combined with aspirin and/or clopidogrel, but in this circumstance patients should be closely observed for signs of bleeding. The need for warfarin should be reviewed after 3 months.

• A number of new anticoagulant therapies are becoming available for use in patients in whom warfarin is inappropriate.

Beta-blockers

• We recommend prescribing beta-blockers in all patients post-MI, especially in patients at high risk of recurrent events, unless contraindicated.[29]

• High-risk patients are defined as patients with either:

– significant myocardial necrosis

– left ventricular (LV) systolic dysfunction

– persistent evidence of ischaemia

– ventricular arrhythmia.

Short-acting nitrates

• All patients should be prescribed a short-acting nitrate, unless contraindicated and provided with a written action plan for chest pain.[28]

Causes

Heart failure is caused by functional and/or structural heart abnormalities, which can be acquired or hereditary and lead to worsening of ventricular ejection and filling capacity.

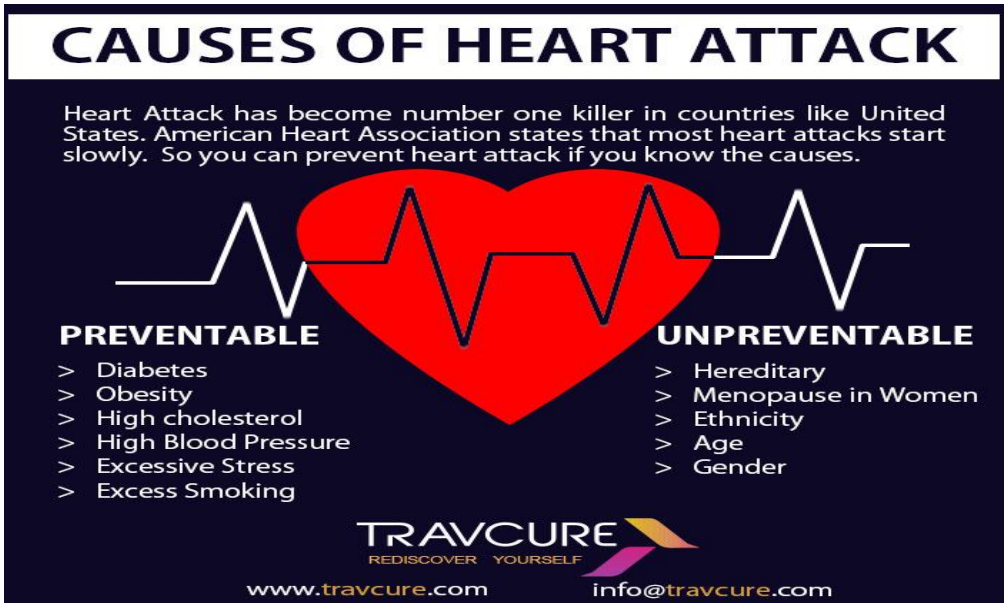


Figure 3: Causes of Heart Attack

What are the signs and symptoms?

The symptoms vary depending on the type of heart disease. For many people, chest discomfort or a heart attack is the first sign.

Someone having a heart attack may experience several symptoms, including:

- Chest pain or discomfort that doesn't go away after a few minutes.
- Pain or discomfort in the jaw, neck, or back.
- Weakness, light-headedness, nausea (feeling sick to your stomach), or a cold sweat.
- Pain or discomfort in the arms or shoulder.
- Shortness of breath.

Figure 4: Warning Signs of Heart Attack

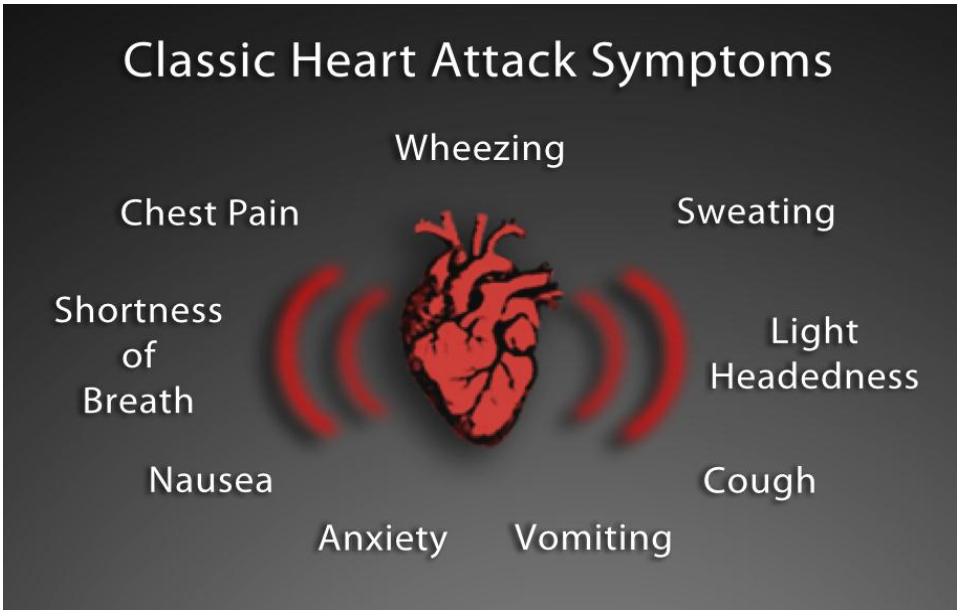


Figure 7 Symptoms of Heart Attack

How is heart disease diagnosed?

Your doctor can perform several tests to diagnose heart disease, including chest X-rays, coronary angiograms, electrocardiograms (ECG or EKG) and exercise stress tests.

How is it treated?

Common treatments for CHD include procedures such as angioplasty and stent insertion (which open blocked or narrowed coronary arteries) and bypass surgery, as well as medications and lifestyle changes to reduce risk factors.

CONCLUSION

Heart failure is an important and growing public health problem: it is the cause of serious depression and death and consumes a significant proportion of the health care budget in most developed countries. The occurrence and popularity of heart failure increase markedly with age and the most common etiology of heart failure is coronary artery disease. There is no evidence to date that the diagnosis of heart failure in the community has improved despite the advances in therapy over the last 4 decades. However, the effect of widespread use of drugs that, in clinical trials, have been shown to prolong life in patients with heart failure may not have become evident at the population level as yet and it is of concern that many patients do not receive optimal treatment.

The number of hospital admissions due to heart failure has been steadily increasing in developed countries for some time and this rise is only partially explained by changes in the proportion of the elderly within these populations. It has been suggested that the treatment of hypertension merely postpones the onset of heart failure to an older age, rather than preventing it.

We need to develop and validate diagnostic criteria for heart failure which utilize modern cardiological investigations and which can be applied in both clinical and epidemiological research. Finally, we need to ensure current scientific evidence on treatment is translated into clinical practice to ensure maximum benefit to the population.

Focused, contextspecific research and careful analyses that integrate medication therapy and preventative lifestyle choices may pave the way for alignment of resources with needs, health systems development, and consequent reductions in depression and death.

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