

Prevention of Coronary Artery Disease — Time for Action!

In Western societies, cardiovascular disease is considered to be the major cause of death, 50% of which is due to coronary artery disease (CAD).

In the USA., it is estimated that 1.5 million Americans suffer acute myocardial infarction each year, 300,000 of whom die before reaching a hospital.¹ The cost of management of patients with coronary artery disease is increasing annually because of using advanced technology in the diagnosis and treatment as well as the cost of hiring experienced personnel. Added to this cost is the cost of loss in productivity due to absence from work. In the USA in 1991, it is estimated that the cost for treatment of cardiovascular disease was more than 100 billion dollars.¹ This constitutes about 20% of the overall cost of medical care. In the USA, there has been a steady decline in the mortality rate since 1960. This decline has been attributed to reduction in coronary risk factors, change in life style, improved treatment of hypercholesterolemia and hypertension and to early diagnosis and treatment of CAD. More than 50% of the decline in mortality of CAD in the US between 1968 and 1976 was attributed to life style changes like reduction in cigarette smoking and serum cholesterol.² There is now strong evidence that controlling risk factors for CAD in a population will be associated with reduction in mortality and morbidity.

A large number of studies has convincingly shown that lowering low density lipoprotein (LDL) cholesterol with diet and drugs can significantly reduce the incidence of CAD in individuals with high serum cholesterol.

The Oslo study showed a 47% reduction in the incidence of myocardial infarction and sudden death in high risk, middle age men who were randomized to receive educational intervention aimed at lowering serum cholesterol levels through dietary modification and smoking cessation.³ Serum cholesterol was reduced by 13% in the intervention group compared to control. The Helsinki Heart study demonstrated a 34% reduction in CAD incidence in middle age men with hyperlipidemia who were randomized to receive gemfibrozil.⁴ There was a 9% reduction in LDL cholesterol levels in the gemfibrozil treated group. Also, high density lipoprotein (HDL) cholesterol increased by 10%. More recently, the Scandinavian Simvastatin survival study (4S) after a median follow-up period of 5.4 years showed a 30% reduction in relative risk with Simvastatin compared to

placebo on overall survival as well as 42% reduction in relative risk of coronary mortality and 34% reduction in relative risk of major coronary artery events.⁵ In this study, 4444 patients with angina or previous myocardial infarction and serum cholesterol 5.5 to 8.0 mmol/L on lipid lowering diet were randomized to double blind treatment with Simvastatin or placebo.

Over the whole course of the study in the Simvastatin group, the mean changes from base in total, LDL, HDL cholesterol and serum triglycerides were -25%, -35%, +8% and -10% respectively.⁵

It is very well known from many clinical trials that hypertension is an important risk factor for cerebrovascular disease and coronary artery disease and treatment of hypertension reduces the incidence of mortality and morbidity from these diseases. Smoking is responsible for an estimated 30% of death due to CAD.⁶ Cessation of smoking results in reduction of mortality and morbidity from CAD. The coronary artery disease surgery study (CASS) showed almost doubling the six year mortality rate in CAD patients who continued to smoke compared to those who had quit smoking before the study began and had not smoked during the study.⁷ The benefit of cessation of smoking was also demonstrated in females in a large study of 119,404 female nurses.⁸ It is well known that overweight is associated with increased LDL cholesterol, low levels of HDL cholesterol, increased triglycerides, hypertension, glucose intolerance, insulin resistance and type II diabetes mellitus.⁹ Reduction of body weight by dietary means and behavioral modification as well as promoting exercise will result in modifying the risk factors associated with obesity. Prevention of obesity, especially in children and adolescents, could be achieved by health education programs and promoting physical activities at schools. It is established that exercise has many beneficial effects including reduction of body weight, reduction of blood pressure, reduction of LDL cholesterol and elevation of HDL cholesterol.

There is growing evidence that oxidation of LDL plays an important role in atherosclerosis.¹⁰ Oxidized LDL is made more atherogenic and more liable to be incorporated into the arterial intima which is an essential step in atherogenesis.¹¹ Rimm EB and Stampfer MJ showed in two large prospective studies, one in males and the other in females, that the use of vitamin E supplement in large doses

was associated with a significant reduction in the risk of coronary artery disease,^{11,12} both studies are observational studies and confounding may partly account for the results. There is a need for large long term randomized double blind placebo control clinical trials. In the meantime, we should not use vitamin E supplement for primary or secondary prevention of CAD until we have a firm scientific basis for its beneficial effects.

The prevalence of CAD in Saudi Arabia is not known. King Abdul Aziz City for Science and Technology (KACST) has recently approved a national project to study CAD in Saudis. The project is designed to study the prevalence of CAD and its risk factors among Saudis of both sexes in rural and urban regions. A part of the project is to study the annual incidence of acute coronary syndromes, invasive coronary investigations and procedures, coronary artery surgery as well as biochemical and clinical parameters.

In the last three decades, there have been a lot of changes in the lifestyle among populations in Saudi Arabia. People are eating more high fat Western diets; obesity, diabetes and smoking are more prevalent, and people are leading a more sedentary lifestyle. Unpublished data from the Saudi National Nutritional Survey and the National Diabetes Study showed that the prevalence of diabetes and obesity are 10% and 34% respectively. In a study among university students in Riyadh, 37% of the 2264 male students were smokers, over half smoking >15 cigarettes per day.¹³ It is clear that there is a need for data on CAD which is going to be supplied by the project already started by KACST. This data will be available in five years; in the meantime, the National Committee on Prevention of CAD, which has recently been established by the Ministry of Health, should work harder on prevention according to available data from developed countries on risk factors and their modification and in light of the success of their National Prevention programs. In any kind of program for CAD prevention, the primary care physician should play a major role in identifying persons at risk and screening them for risk factors and work on risk factor modification. Cardiologists and other physicians should take a more active role in the prevention of CAD. We should direct attention to work on changing the passive attitude of many physicians and health policy makers regarding prevention, not only of CAD but of many of today's diseases which are potentially preventable.

In Saudi Arabia in the last 20 years, cardiac care has advanced to a great extent, like many other specialties.

There are many cardiac centers delivering full cardiac care including interventional cardiology procedures and cardiac surgery. Cardiac transplant is performed at three centers. Due to increasing numbers of patients requiring cardiac care, there is a plan to expand the present centers' facilities and to open new cardiac care centers. During the process of achieving the goal of establishing good facilities for delivering cardiac care, we should not neglect working on prevention of CAD, especially in light of increasing numbers of patients with CAD and the escalating cost of health care. Let us work on CAD prevention now before it is too late.

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