Commentary

With increasing ageing in Western populations, what are the prospects for lowering the incidence of coronary heart disease?

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Summary

Coronary heart disease (CHD), rare in the early 1900s, in the 1970s was responsible for almost a third of deaths in Western populations. Although its mortality rate has fallen, even halved in some populations, there appears to have been no falls in its incidence rate. With current trends, and in view of the rapidly rising elderly population—are there any hopes of significant declines in its incidence rate?

Introduction

In Western populations, coronary heart disease (CHD) continues to be the leading cause of death. While its mortality rate has fallen, even halved in some populations, there appears to have been no falls in its incidence rate. With current trends, and in view of the rapidly rising elderly population—are there any hopes of significant declines in its incidence rate?

Present burden of coronary heart disease

In 1912, within the lifetime of some still living, in the chapter on angina pectoris in Osler’s Principles and Practice of Medicine, it was stated that ‘it is a rare disease in hospitals: a case a month is the average, even in the large metropolitan hospitals.’ However, from the 1920s onwards there were enormous, indeed, ultimately, catastrophic rises in the occurrence of CHD. Whereas previously it had been responsible for less than 1% of all deaths, in some Western populations its occurrence rose to such an extent that in the 1970s it was causing almost a third of all deaths. From the 1980s onwards, in a number of populations there have been major decreases in mortality rate from the disease; falls appear to be maximal in the US, where the rate has halved. Decreases have been
smaller in most other Western populations, moreover, in some, mainly Eastern European countries, there have been increases in mortality rate. Very unfortunately, the incidence of the disease has not fallen correspondingly; indeed, there would seem to have been little change in the numbers of CHD patients admitted to hospital. The falls in mortality therefore seem attributable to secondary, not to primary prevention.

Understandably, the insufficiently appreciated effects of ageing in populations, on their own, will tend to raise incidence rates.

The ageing of populations

How far have we come in expectation of life? In the time of Aristotle, in the 5th century BC, babies were not named for a week since most of them had died by then. As late as 1850, the average expectation of life among the very poor, the ‘mechanics, servants, labourers,’ who composed a large proportion of the population, was 15 years, largely due, however, to the high mortality rate among the very young. Nowadays, in Western populations (e.g. that of the UK), expectation is 75 years for men and 79 years for women. Furthermore, according to an editorial in the Lancet, ‘survival to 100 or more may become the norm.’ In the UK in 1951, 300 were centenarians; in 2030, the likely number will be 34 000. With the falling birth rate, i.e. a one-child family, by the year 2050, it has been predicted that a third of some Western populations, e.g. those in Spain and Italy, will be 65 years and over, double the proportion at present.

This major change in the structure of Western populations will tend to offset current endeavours to lessen morbidity/mortality from CHD, and, of course, from other chronic diseases of lifestyle. Already elderly patients occupy half of all hospital beds in the UK.

Risk factors for coronary heart disease

To what extent can CHD be controlled by endeavouring to combat its risk factors? One unmodifiable risk factor is ageing, as indicated. There is also a familial risk factor. The modifiable risk factors are well known, and numerous recommendations have been made to hinder the development of the disease. As an example of recommendations, in the Patient Page of the Journal of the American Medical Association, the urges for the prevention of CHD, at their briefest, are: ‘Exercise regularly to help prevent having a first heart attack or a recurrence; if you smoke, stop completely; if you have high blood pressure, high cholesterol, or diabetes, work with your doctor to keep the condition under control; and maintain a healthy weight and eat a low-fat diet.’

Limitations of knowledge of risk factors

Despite the considerable increases in the knowledge of risk factors, those which are known still explain only about half of the variation in the occurrence of CHD. Because of deficiencies of knowledge, as would be expected, there are numerous puzzling situations. To illustrate, in the UK, in the PRIME study, it was found that the classical risk factors do not explain the severalfold differences in CHD mortality rate between France and Northern Ireland, clearly indicating the operation of other factors. In the recent MONICA study, data on the trends of change were collected from 38 populations, on those aged 35–64 years, respecting CHD mortality rates, 28-day case fatality, and the prevalences of smoking, blood pressure, cholesterol, and obesity. It transpired that the scatter plots of the 38 centres showed an unexpectedly weak relation between the size of the recent decline in the mortality rates and in individual risk factors, and in a composite risk factor score. For example, the mortality rate in Poland was five times higher than that in Spain, for reasons far from explicable by conventional heart ‘risk factors.’ Nevertheless, in the MONICA study it was stressed that ‘coronary risk is multiplicative. Stopping smoking halves your risk regardless of the number of other factors, known and unknown.’ In both the PRIME and the MONICA studies, the authors strongly emphasized the need to reduce the conventional risk factors, the aetiological importance of which has been ably demonstrated by numerous observational studies.

Responses to the need to address risk factors

Changes made in diet have been slight. In adults, in the US, energy from fat intake has fallen by a tenth, but there have been minimal rises in the intakes of vegetables and fruit. In the UK, and in the cases of some other European countries, while there have been some rises in the intakes of vegetables and fruit, the changes have been slight. But there have been no falls in fat intake, which still supplies about 40% of the energy (i.e. 25% higher than the 30% recommended). Interestingly, in adolescents in Scotland and Germany, the proportion is 42%. As to reductions in non-dietary risk factors, although smoking practice has almost halved, its decline appears to have halted. Among youth, disappointingly, smoking is rising and, with
drinking and drug-taking, has doubled in some populations.\textsuperscript{24} There is, unfortunately, little realization that smoking can reduce life expectancy by as much as 20 years.\textsuperscript{25} Alcohol consumption in most Western countries continues to be high, although it differs markedly—that in France is double that in the UK.\textsuperscript{26} Interest in physical exercise is low and apparently is lessening in young people. In the US, among high school students in the first half of the 1990s, their daily attendance in physical education declined from 42\% to 28\%.\textsuperscript{27} In this instance, again, there is little appreciation that low physical activity can contribute up to 23\% of all deaths from chronic diseases.\textsuperscript{28} It is important to note that closely linked with low level of exercise, the prevalence of obesity has recently doubled in many populations;\textsuperscript{29} in fact, such has been the increase in the US that at the present rate, it has been predicted that by 2230 ‘all Americans will be obese.’\textsuperscript{30}

As to lack of responses in other respects, in the US, there appears to have been no fall in the prevalence of hypertension,\textsuperscript{31} nor in the extent of coronary atherosclerosis.\textsuperscript{32}

\textbf{Impediments to combating risk factors}

Certainly, all wish to avoid disease and to enjoy the maximum years of ‘wellness’. Why then have the responses to change been so limited? How much is due to lack of knowledge and to lack of willpower?

\textbf{Problems in acquiring health knowledge}

In seeking to inculcate desirable health knowledge in children, not unexpectedly, the many food advertisements help little. In the US, in an analysis of the type of information given in children’s Saturday morning television programmes, it was found that 41\% of the messages were the very antithesis of healthy eating for children.\textsuperscript{33} Then, as is well-known, in many countries there is the widespread desire of schoolchildren to lose weight. For example, in a group of Australian teenage girls, within the previous month, a third of them admitted to having had a ‘crash’ diet, fasted, used pills, diuretics, laxatives, or cigarettes to reduce weight.\textsuperscript{34} In another area of nutrition of the young, the provision of school lunches, in the US, in an official enquiry, it was found that only 1\% of those assessed complied with the recommended targets.\textsuperscript{35}

As to lack of knowledge, it is noteworthy that, in a survey made of women aged 30–60 years in Denmark, all age groups expressed satisfaction with their diets, in spite of the general high level of fat intake.\textsuperscript{36} Scottish consumers were reported to be complacent about their consumptions of fruit and vegetables, which, at 2–4 portions daily, is half the recommended level.\textsuperscript{37} To give an example of unwillingness to make dietary changes in the US, in a recent national enquiry which involved 12,000 people and concerned their nutritional knowledge and beliefs, it was found that the huge majority of the respondents, 83\%, believed that eating the right kind of foods can reduce their chances of developing major diseases.\textsuperscript{38} In this respect, over 50\% mentioned cancer and 60\% heart disease. The eating of more fibre, fruits and vegetables, and of reducing fat intake, were identified by respondents as being helpful to reduce the risk of the diseases mentioned. However, when respondents were asked how many servings of fruits and vegetables they consumed daily, only 7\% reported the recommended five or more, with over 60\% reporting two or fewer.

As to health recommendations emanating from the media, certainly an enormous amount of information on health maintenance and disease prevention is available in books, and information is widely disseminated through programmes on the radio, on television, and in magazines. Yet such situations as the unquestionably rising prevalence of obesity, suggest that despite the considerable nutritional interest evoked in many, little meaningful application is being made in everyday life habits.

\textbf{Knowledge from health services}

What of the use being made by the public of help from preventative health services? In the US, it has been stated that ‘despite abundant evidence for both the effectiveness and cost-effectiveness of clinical preventive services, most remain grossly underused and represent a missed opportunity to reduce morbidity and mortality from preventable diseases.’\textsuperscript{39} It was stated that interventions of known efficacy include childhood and adult immunizations; measurement of serum cholesterol; and screening for breast, cervical, and colorectal cancers. Nevertheless, ‘rates of use of adult preventive services are staggeringly low across the country, particularly compared with the high compliance rate for childhood immunizations.’

\textbf{Knowledge from the family physician}

What level of help is afforded through the family physician? Some interventions, through the counselling of physicians, have been very successful. Thus, in one study, nutritional counselling produced beneficial changes in diet, weight, and blood lipids, although the initial intervention time took three times longer than in the case of the control group.\textsuperscript{40} Doubtless many patients have been helped. However, it is disappointing to note that in a survey
made of a large number of US medical practitioners about the factors which they considered to be ‘very important’ to health promotion and maintenance, only half of them thought diet worth ranking in this classification.41 Understandably, lack of support leads to missed opportunities during patients’ visits to provide information on achieving healthier life styles. In one investigation, at the times of consultation and of medical examinations, it was found that physical activity was addressed in the case of only 19%, diet in 23%, and weight in 10%; only 41% of current smokers were advised to quit.42 An illustration of the attitude described is provided in the US, at the time of an enquiry concerning who should teach patients about nutrition. At a meeting on Continuing Medical Education in relation to preventive medicine, it was related that ‘the obligatory continental breakfast consisted of bagels and cream cheese, butter laden pastries, and half and half for the coffee. Lunch featured chicken covered with melted cheese, followed by cheesecake for dessert. The physicians and nurses at the meeting were not struck by the contradiction between their subject matter and the meals’.43

State responsibilities

Concerning the need for State intervention, in the UK, at a National Heart Forum, it was urged that a government food plan is needed to reduce deaths from CHD.44 It was stated that in the 1970s, unskilled men (social class V) had 25% excess CHD mortality compared with those in professional occupations (social class I), but by the early 1990s, this gap had widened to a threefold difference. Over the same time period, the proportion of people earning less than half of the average national income had increased from 8% to 25%. At the forum it was stated that ‘the rapid fall in mortality in the higher social classes has demonstrated what is achievable. But putting up a few posters and telling people to change their lifestyle doesn’t work. We need to provide them with the background to help them make healthy choices.’ The forum urged the government to make heart disease a test case for trying to reduce health inequalities, to set national and local targets, and, moreover, to make children a focus for the strategy. It was emphasized that a national food plan should be introduced to increase the consumption of fruit and vegetables in the lower social classes and to reduce saturated fat intake. These measures should include the provision of free school meals, including breakfast, for children in low-income families; free fruit and vegetables at schools; ring fencing the food cost element in welfare benefits; there should be social fund grants, rather than loans, for cooks and fridges; and an extra dietary allowance for low-income women who breast feed. The recommendations advocated; in brief, should be aimed at making the desired dietary changes, at reducing smoking, boosting physical activity, and in relieving work-place stresses in the lower social classes.

In the same vein, also in the UK, in the Lancet’s ‘Hard sell for health’,45 while it was acknowledged that ‘it is a common experience that even when people are fully aware of the risks that their indulgences incur, many carry on regardless,’ it was emphasized that health deserves to be marketed with verve and commitment. Thus, it was urged, that health centres should be sited where the public congregate, such as supermarkets and sports centres. Public officials should seek the advice of public relations experts, advertising specialists and retailers. People may then consider that ‘if the state cares so much for them, perhaps they should do something about caring for their health themselves.’

There must be appreciation of what can be done

In Australia, in an editorial on cardiovascular disease at the turn of the century, on the need for multi-faceted approaches to reduce the burden from CHD, it was emphasized that ‘we need to know how best, beyond advocacy, to change behaviour in groups on whom it is most difficult to do so.’46 Certainly, on the one hand, there must be caution over the ‘tyranny of health’ (‘do this’, ‘stop doing that’).47 But, at the same time, in this field, it is highly desirable for the public to have some knowledge of the better than average health which prevails in some populations, with lower risk factors, as is the case with certain Mediterranean populations.48 In respect of individuals/communities who enjoy better than average health, there are vegetarians49 and Seventh Day Adventists.50 In respect of one particular group, namely, Mormon priests who were non-smokers and who pursued active lives, a study revealed that their standard mortality ratios, relative to US white men at 100, were almost unbelievably low, 14 for cardiovascular diseases and 22 for all causes.51

An example of what can be done, although using heroic means, is afforded in the US in a recent 5-year randomized trial which concerned the making of radical changes in life-style. It was concluded that ‘intensive life style changes can stop and even reverse the effects of atherosclerosis in the coronary arteries. The problem is getting people to change. We found the fear (of dying) was a short-term motivator, but the key was to help people discover why they smoked, drank or ate too much.’52
Conclusions

The magnitude of the CHD problem is probably insufficiently appreciated. To reiterate, although mortality from the disease has fallen substantially in the past two decades, it remains the single leading cause of death for adults, and is expected to remain the leading cause of death and disability in the western world well into the 21st century.53 At present, as revealed by the US Framingham Heart Study, the lifetime risk of CHD at the age of 40 years is 1 in 2 for men and 1 in 3 for women.53 In a recent editorial in the New England Journal of Medicine, the two nutritional dilemmas were set out.54 The first concerns those well-circumstanced, whose diet, according to current guidelines, should revert ‘in many respects to the traditional pattern of poor people throughout the world.’ The converse situation is that ‘as poor people raise their standard of living, they may adopt the eating patterns that have traditionally been associated with higher incomes, but which are no longer considered desirable.’ As will have been apparent, the responses to lessening the intensity of risk factors, whether it be because of ignorance, indifference or lack of conviction, have been slight. As recently summarized, ‘health is not a priority for most people in the course of their daily lives, and only surfaces when health problems emerge. Studies have found little evidence that changes in health-related behaviour were a response to formal health messages.’55 This view was underlined in a recent contribution on ‘communicating the evidence’ which stated that ‘simply supplying high quality evidence will not be sufficient for such evidence to be translated into practice.’56

On the one hand, there is the Arcadian dream that ‘Nature did not intend us to grow old and ill; we were designed to die young of old age, but free of disease . . .’.57 At the same time, pragmatically, the situation is that current expectation of life has never been longer, and it may well increase still further. Accordingly, one view expressed is that when advice is sought regarding health improvements, certainly every possible help should be given. Otherwise, it was considered that apart from those who have major disadvantages (e.g. the heavy smoker, the severely hypertensive, the very obese), ‘people should be encouraged to live lives of modified hedonism, so that they may enjoy to the full the only life that they are likely to have.’58

In the absence of ‘hard sell for health’ endeavours, and with the limited little ‘listening, responding, and acting,’59 the likelihood of large-scale compliance with urges to adopt ‘healthy living’ practice, so as to lengthen the years of ‘wellness’ and lessen liability to CHD, would seem remote.

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