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How effective is prevention in coronary heart disease?

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To most general practitioners, the jewel in the cardiovascular prevention crown is secondary prevention. Patients are easily identified and of a limited number, their absolute risks are high, the interventions apparently straightforward and the impact significant. But how significant and for how long? The importance of determining long-term outcomes is highlighted by the 10-year follow-up study reported in this issue of the journal by Delaney *et al* (see page 1419).¹ Their work is important: it is the first report of the longer-term value of a primary care based intervention in coronary heart disease (CHD).

EVALUATING THE EFFECTIVENESS OF INTERVENTIONS

Delaney *et al* remind us of evidence showing improved survival and fewer cardiac events among people with CHD 4 years after their enrolment in the intervention arm of a trial of nurse-led clinics in general practice.¹ They now report outcomes after 10 years' follow-up. Although more deaths had occurred in the control group after 10 years, differences between the intervention and control groups failed to reach statistical significance.¹ The authors recognise that a possible dilution effect of the intervention might have arisen since, 1 year after the start of the original study, all patients had the opportunity of attending secondary prevention clinics.

Other studies have also encountered methodological difficulties when attempting to evaluate the effectiveness of prevention in CHD. These include the difficulties of maintaining uncontaminated control groups over time and the need to try to minimise contamination effects, particularly when both intervention and control

patients are managed by the same practitioners. There is also a challenge in assessing the effects of any intervention in relation to outcomes among prevalent cases, which by their nature tend to be clinically heterogeneous, in comparison with the more ideal use of incident cases, identified at the point of diagnosis using clearly defined inclusion criteria and followed up prospectively. In addition, there is a need to recognise that it is difficult to isolate the effective components of complex and multifaceted interventions,² such as are often used in CHD prevention. Another complication, often overlooked, is measurement of treatment fidelity—was the intervention delivered as intended? Furthermore, as in Delaney's study,¹ where there is a lack of individual data about comorbidity, there is uncertainty about the possible confounding influences on the outcomes. Studies which have experienced difficulties in recruitment bias and ethical constraints,³ with consequent inability to obtain information about health services use and outcomes for people who do not agree to participate in research, have been limited in the ability to generalise their findings. Attempts to provide long-term evidence of the effectiveness of interventions to prevent CHD are constrained by these limitations.

POPULATION STATISTICS

During the decade before 2000, CHD mortality fell by about 50% in both the UK and Ireland.^{4,5} Using a validated statistical model to estimate the relative contributions of specific treatments and prevention to this decline, it was shown that about half was attributable to reductions in major risk factors, particularly smoking, both in England and Wales⁴ and in Ireland.⁵ The contributions of other factors to the decline were also examined: about 30% of the decline in mortality in Ireland and 10% in England and Wales was attributable to reductions in population levels of cholesterol, and about 6% in Ireland and 10% in England and Wales was attributable to reduction in blood pressure. However, it was noted that the

impact of these changes in the population was counterbalanced to some extent by the adverse effects of an increasing prevalence of diabetes, obesity and physical inactivity.

PRIMARY VERSUS SECONDARY PREVENTION

Debate continues about the relative effectiveness of primary and secondary prevention for CHD. A systematic review of multiple risk factor interventions in primary prevention, in 1997,⁶ concluded that interventions comprising counselling, education and drug treatments were more likely to be effective in high-risk groups than in the general population. It was suggested that in relation to primary prevention higher priority should be given to fiscal and legislative changes in order to protect the nation's health. A more recent analysis again showed that the effectiveness of a prevention strategy is greatest among those with highest baseline risk.⁷

For effective prevention of CHD nationally there is a need both to treat patients at high risk and to implement population-based strategies. The currently recognised epidemics of physical inactivity and obesity emphasise the need for measures which require multiagency action. Individuals and communities must change if these measures are to be effective in promoting healthy lifestyles and preventing the development of CHD. In practice, clinicians are moving away from a comparison of primary and secondary prevention towards a focus on multiple risk factor intervention for all their patients.

PROVIDING SECONDARY PREVENTION

General practice has been identified as an ideal setting for delivering secondary prevention. Despite this, evidence indicates that provision is suboptimal. Provision of secondary prevention can be improved by using specific disease management programmes, but the optimal mix of their components remains uncertain.⁸ Structured systematic care is important to improve levels of secondary prevention. An effective register, recall system and routine audit of care are essential components of such a system but there is also a need to consider doctors' and patients' perspectives on heart disease⁹ and to deal with specific barriers to change for people in particular settings.¹⁰

Alongside a review of its effectiveness, the cost effectiveness of prevention must also be considered. Previous studies have shown that secondary prevention in general

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practice is cost effective.^{11 12} Its implementation was not associated with increased health service costs and was associated with improved survival and quality of life. The continuing SPHERE study, testing a multifaceted intervention¹³ designed to respond to identified patient and practice needs, will add further evidence about the cost effectiveness of secondary prevention as it will link costs to changes in risk factors, use of health services, cardiac morbidity and quality of life.

MONITORING PROVISION OF PREVENTION

Implementation of the Quality and Outcomes Framework in primary care within the NHS has provided financial incentives for GPs to monitor their provision of secondary prevention through levels of recording and control of risk factors. However, the effectiveness of recording these measurements on reduction of morbidity or mortality is not yet known; meeting targets does not necessarily mean that good management is being implemented¹⁴ and that hard clinical outcomes will be improved for individual patients. Information relating to the process of care and provision of treatment may provide a better assessment of the quality of preventive care provided and thus better inform future evaluation of its effectiveness in practice.¹⁴

CONCLUSIONS

Prevention in CHD is important. The evidence to date indicates that it is well worth doing despite the difficulty in answering with precision questions about its level of effectiveness. Secondary prevention still glistens as the jewel in the cardiovascular prevention crown. Questions about its long-term effectiveness and optimal mix of components remain as a research and clinical priority.

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