Trends in cardiovascular disease: Are we winning the war?

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∞∞ See related research paper by Tu and colleagues, page E118

Cardiovascular disease generates a substantial burden of illness in Canada and beyond. Yet recent epidemiologic trends have been very encouraging. Deaths and rates of morbidity from cardiovascular disease fell by at least 50% in most countries from about 1980 to 2000. Some two-thirds of this decline can be attributed to a decrease in adverse events and reflects reductions in the prevalence of major risk factors. The remaining third is attributable to reduced case-fatality rates, owing mainly to treatments.[1] This victory is worth celebrating; but are we winning our long-term war against cardiovascular disease?

Key points

- In Canada between 1994 and 2004, mortality and rates of hospitalization due to cardiovascular disease declined by about 30%.
- Reductions in the prevalence of major risk factors contributed to about two-thirds of this decline, whereas the remainder is attributable to treatments.
- Over 80% of cases of premature cardiovascular disease can be prevented through population-wide control of tobacco and governmental policies that promote a healthy diet.

In this issue, Tu and colleagues report on trends in cardiovascular disease in Canada between 1994 and 2004.[2] Mortality due to cardiovascular disease fell by 30% in this period. The decline was slightly more for acute myocardial infarction than for stroke and heart failure. Hospitalization rates for stroke and heart failure fell by 27%, whereas age-adjusted hosital admission rates for acute myocardial infarction apparently fell by only 9%. The true proportion is probably greater but concealed by the effects of the aging and growth of the population, by diagnostic changes that have inflated patient numbers and by the counting of episodes rather than of patients. The practice by hospitals of recoding diagnoses to maximize income may also have contributed to the apparent 33% decline of in-hospital case-fatality rates among patients with acute myocardial infarction. In contrast, reductions in case-fatality rates due to stroke and heart failure were relatively modest. An increase in the average age of patients in Canada, as elsewhere, was consistent with a "compression of morbidity," which means that disease commences at a later age and affects a shorter period of the total life span. It is crucial to note that most deaths occurred outside of hospital, many among individuals with no prior diagnosis of cardiovascular disease.

As the first such evaluation in Canada, the study by Tu and colleagues had many strengths. It was comprehensive, specific to Canada and based on data of adequate quality. Its acknowledged limitations included its analysis of episodes rather than individuals, leaving open the possibility that a greater reduction in incident-related hospitalizations may have occurred but been obscured by an increase in recurrent admissions. A lack of information on case mix means that severity of disease may have declined as thresholds for admission to hospital were relaxed. The apparent decline in case-fatality rates may thus have been inflated.

The findings of Tu and colleagues are generally consistent with those of analyses in the United States and Europe. Using linked data in Scotland, McIntyre and colleagues[3] found that admissions for chest pain and unstable angina increased by about 40% while rates of myocardial infarction declined by about 30%. In the Netherlands, a study by Koek and colleagues[4] using a similar approach found that rates of myocardial infarction declined by 20%.

Such studies provide valuable information for quantifying trends in burden of disease and making cautious projections. It is problematic, however, to assume that rates of hospitalization represent an accurate measure of incidence or that they can be used to estimate prevalence directly. Drawing a relation between trends in mortality and hospital admission and changes in medical and surgical treatments is also complex. Furthermore, many out-of-hospital deaths among patients with no prior diagnosis of cardiovascular disease are sudden, and thus amenable only to primary prevention.

Canadians see themselves as being different from Americans. Trends in cardiovascular disease over the last 3 decades, however, show a striking similarity. Ford and colleagues[5] recently reported a 43% total decline in deaths due to coronary heart disease between 1980 and 2000. Using a validated and comprehensive policy model, they attributed about 47% of this reduction to specific medical therapies. Among these therapies, revascularization made a surprisingly small contribution. A decrease in the prevalence of major risk factors potentially contributed to two-thirds of the total decline in mortality. However, this improvement was offset by substantial increases in rates of obesity and diabetes, which were in turn compounded by persistence in the prevalence of smoking (particularly among younger age groups) and rates of hypertension that were previously in decline but have now, ominously flattened.[5] These adverse trends in serious risk factors for cardiovascular disease are worrying, especially given recent similar trends in many other countries. Analyses of Canadian data will thus be of great interest.

Is the party over? Flattening rates of death from cardiovascular disease in younger age groups have now been reported

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in the United States, the United Kingdom, Australia and elsewhere. This stall in progress is occurring in spite of the availability of evidence-based therapies for the majority of eligible patients.[6,7] Worsening trends in cardiovascular disease may be even greater among people in socially deprived groups.[8] Given that rates of cardiovascular disease increase steeply with age, demographic aging compounded by an expansion in population in most industrialized countries represents an iceberg of hidden cardiovascular disease which will become visible in the very near future.

What are the implications of these trends for clinicians and health care systems in Canada and elsewhere? Cardiovascular disease will remain the most common cause of death for the near future. Large numbers of patients with cardiovascular disease will flood our hospitals. Over time they will be older and thus more challenging to treat. Therapeutic extension of life expectancy will be correspondingly shorter, forcing us to concentrate more on improving quality of life rather than just prolonging it slightly.

Prevention, therefore, becomes vital, because over 80% of premature cardiovascular disease is avoidable.[9] Medications to reduce lipids and blood pressure will help. But the promotion of population-wide control of tobacco, cessation of smoking, a healthier diet and increased physical activity is crucial. A large impact could be made by such interventions at the global, national and provincial levels, potentially halving the future burden of cardiovascular disease.[10,11] Feasible policy, legislative and fiscal measures could eradicate industrial trans fats, halve the dietary intake of saturated fats and salt, make fresh fruit and vegetables cheaper, increase physical activity and render smoking prohibitively expensive. Healthcare professionals have a major responsibility to support such initiatives, which could substantially reduce the costly societal burden of cardiovascular disease. However, tracking the effectiveness of preventive interventions will demand regular, high-quality monitoring. We therefore look to Tu and colleagues from Statistics Canada and to other sources to provide us with reports on a regular basis. We have triumphed in recent battles against cardiovascular disease but we need to win the longer war.

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