

Management of hypertension: Regional variations in a greatly improved landscape

Sheldon W Tobe MD FRCPC

The data presented by Mohan et al (1) in this issue of *The Canadian Journal of Cardiology* demonstrate that we still have much to do to manage this most reversible of cardiovascular risk factors. However, it also demonstrates how far we have come and what tremendous successes have been made in Canada in managing hypertension, which is globally recognized as a chronic disease that is a primary risk factor for heart disease and stroke (2). These successes have not come easily and are the result of a partnership among the Canadian Hypertension Education Program (CHEP) representing many of Canada's best and brightest hypertension researchers and educators (3,4), the Public Health Agency of Canada, the Heart and Stroke Foundation, academic health science centres and peer-reviewed granting agencies such as the Canadian Institutes of Health Research.

The team assembled to perform this work and the data sets used demonstrate that we are now operating well within the new paradigm of multipillared research. In their introduction, Mohan et al illuminate the important pathway from the bedside to the bench and back again, highlighting the effectiveness of managing blood pressure-related disease to reduce the societal burden of individual cardiovascular events (5). Then, by moving from the bedside to the 'bureau', they demonstrate that with access to institutional data sets, they can analyze health systems and services to determine whether the health needs of our population are being adequately and effectively met.

The motivation for this work comes from the Heart and Stroke Foundation of Ontario-funded Ontario Blood Pressure survey (6), which showed a stunning achievement in hypertension awareness, treatment and control in the province of Ontario. This survey found that control of blood pressure in hypertensive patients was 66% in 2006 (7) – a dramatic improvement from the Canadian Heart Health Survey (8) conducted 15 to 20 years earlier when it was less than 15% nationally and provincially. Access to the Canadian Community Health Survey of representative data and the Intercontinental Medical Statistics CompuScript database allowed for the assessment of provincial comparisons and regional variations in the treatment of hypertension, and exploration of the factors associated with these variations.

Much of the credit for the improvement in awareness treatment and control of blood pressure in Canada is due to the visionaries who created CHEP and its expert health care volunteers who, over the past 10 years with multiple partnerships, stakeholders, supporters and multidisciplinary participants, have created what is increasingly being viewed as an international model for knowledge translation (9). The work by Mohan et al is a product of the Outcomes Research Task Force. This group was developed to evaluate the effectiveness of CHEP in improving the assessment, treatment and control of hypertension in Canada. Its five subgroups examine the hospitalization and mortality rates for acute stroke, myocardial infarction and heart failure; participate in national health surveys to determine awareness and treatment of hypertension; analyze provincial administrative databases to track hypertension diagnosis and treatment; monitor national prescriptions of antihypertensive drugs; and review the economics of hypertension.

The analysis by Mohan et al highlights the achievements of blood pressure control in Canada since Khan et al (10) reported in 2002 that

59% of hypertensive Canadians did not have their blood pressure treated according to the 2001 Canadian hypertension recommendations (11). Onysko et al (12) found that by 2003, there was a greater awareness of hypertension and use of antihypertensive drugs in Canada compared with before 1999 – the first year that CHEP began its annual recommendations process. In 2007, Neutel and Campbell (13) reported that blood pressure management was shifting to reflect CHEP recommendations with a greater use of antihypertensive combinations and greater persistence with therapy. Recently, Campbell et al (14) found that reductions in death rates for stroke, heart failure and myocardial infarction after 1999 were associated with increased antihypertensive prescription use. This evolving story speaks loudly about the growing success of CHEP, which is already showing health dividends for the massive number of volunteer hours invested to date. Estimates for the annual costs in Canada of managing strokes in the first year is over \$50,000 (15) and for heart failure approximately \$15,000 (16). A simple estimate based only on the reduction from 1999 to 2004 for heart failure and stroke admissions (14), using these cost estimates and assuming that blood pressure control is responsible for only one-half of the reduction of these events, leads to savings for the Canadian health care system of over \$100,000,000 annually. This demonstrates the well-recognized cost effectiveness of blood pressure control, which compares favourably with other risk factor-reduction strategies, particularly in high-risk populations (17).

The analyses by Mohan et al demonstrate that blood pressure awareness, treatment and control are much better than when first assessed by the Canadian Heart Health Survey of 1985 to 1992. For example, the national rate of treating hypertension patients with antihypertensive therapy has increased to over 85% from just 33% (8). Drilling down on the national data, however, reveals regional variability in hypertension treatment, with the lowest odds of remaining untreated according to the adjusted model in Quebec and the highest overall rate of not treating hypertension in Canada's north, reflecting the younger demographic in that region. These data make sense, and are likely due in large part to the impact of the quantity and excellence of research and education activities centred in Quebec that are carried out by members of the Quebec Hypertension Society. The larger treatment gaps in Canada's north and in the west point to the need for flexibility in programs for blood pressure management to reflect the specific conditions and needs of Canada's different regions.

While the data reported by Mohan et al are encouraging, they reinforce the benefits derived from a national blood pressure strategy, and the need for the development of regional approaches to blood pressure management and research into how to address treatment gaps identified. To maintain and build on the success of the current program will require a continuation of the energy and commitment of the volunteers from CHEP, and the ongoing support of its many partners including the government (Public Health Agency of Canada), non-governmental agencies (Heart and Stroke Foundation) and research funding agencies such as the Canadian Institutes of Health Research. The investment in time and resources has thus far proven highly effective. As our country faces the chronic disease management onslaught from the aging baby boom generation, now often referred to as the

Division of Nephrology, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Ontario

Correspondence and reprints: Dr Sheldon W Tobe, Division of Nephrology, Sunnybrook Health Sciences Centre, University of Toronto, A240,

2075 Bayview Avenue, Toronto, Ontario M4N 3M5. Telephone 416-480-6901, fax 416-480-6940, e-mail sheldon.tobe@sunnybrook.ca

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'silver tsunami', mirroring other chronic disease management strategies to the successes of CHEP seems like an obvious course. The excellent work by Mohan et al demonstrates that Canadians can be proud and confident that their hypertension researchers are working successfully to improve their health across the country.

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