PERSPECTIVE

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Time to tackle blood pressure

Simply lowering blood pressure would reduce the risk of both stroke and age-related cognitive impairment, says **Walter J. Koroshetz**.

Stroke has obvious, permanent, devastating consequences: it affects physical and mental abilities that strike at the very nature of what makes us human.

The good news is that we know how to keep strokes from happening. Controlling factors such as high blood pressure, obesity, smoking and sedentary lifestyle is effective in preventing strokes. The number of people dying from strokes in the United States has fallen by as much as 70% since the 1960s (ref. 1) — rivalling some of the advances in controlling infectious disease.

The greatest risk factor for stroke is high blood pressure. The data tell us that the likelihood of stroke decreases as blood pressure is lowered². And by getting to grips with blood pressure, we can prevent not just the death and physical disability that so often result from stroke, but also age-related cognitive impairment and dementia³. Most people who die with a diagnosis of dementia have a mixture of Alzheimer's and vascular disease⁴. A fall in stroke rates would therefore be expected to translate into a decreased risk of dementia — and a study last year from the United Kingdom suggests that this is indeed happening⁵.

On the bright side, most strokes can be prevented using medical information that we already have — we know a great deal about how to control blood pressure. We are probably sitting on a set of very effective antidementia therapies, but this message has not made it to the public or to policy-makers.

In fact, the blood-pressure front seems to be backsliding. Earlier this year, influential guidelines published in the *Journal of the American Medical Association (JAMA)* recommended that physicians become less strict about their patients' blood pressure⁶: people over 60 years old can have systolic readings of up to 150 mmHg — a significant increase from today's threshold of 140 mmHg.

This is a perilous step. The risk of stroke increases dramatically with each decade after the age of 60 — and stroke rates in this age group decrease with every incremental drop in blood pressure. It is not clear where that effect plateaus. For instance, even when it failed to decrease the risk of major cardiovascular events overall, targeting a systolic blood pressure of 120 mmHg rather than 140 mmHg did lower the incidence of stroke in people with type 2 diabetes⁷. And in a trial aimed at preventing second strokes, aggressive blood-pressure control — along with reduced lipid intake and other lifestyle modifications — almost halved the incidence of second strokes compared with the less-strict approach taken in another trial in a similar population⁸. If practitioners adopt the liberal targets, they will almost certainly be inviting an increase in the stroke rate.

Perhaps the most effective way to promote brain health — lifestyle modification — is inexpensive but sociologically difficult. Exercise is thought to improve brain health by lowering blood pressure, decreasing obesity and preventing stroke and heart disease. However, using medications to control blood pressure is the true low-hanging fruit. And it is underused. In the United States, 29% of adults have high blood

pressure — but only half have it under control⁹. That is still a lot better than in China, where the prevalence of high blood pressure is almost identical to that in the United States but only 9.3% of people have their condition under control¹⁰. It is no coincidence that stroke is China's leading cause of death and the risk of dying from stroke there is twice as high as in the United States.

Why doesn't the United States control blood pressure more effectively? This is of particular concern in the African American population, which is especially vulnerable to the tissue damage linked to high blood pressure — such as white-matter stroke, kidney disease and heart disease — at a relatively young age.

There are still things that researchers do not know, such as what the optimal blood pressure is. The Systolic Blood Pressure Intervention Trial funded by the US National Institutes of Health is testing the effects of keeping systolic blood pressure readings below 120 mmHg in 9,000

people at risk of heart or kidney disease, and a sub-study called SPRINT-MIND is using magnetic resonance imaging and cognitive testing to find out whether lowering blood pressure is good for the brain for reasons other than preventing stroke. Quality-of-life measures are important in such studies to learn how to balance the risk of stroke against the adverse effects of aggressive blood-pressure lowering, such as lightheadedness and fainting. Some studies, including the *JAMA* guidelines, treat stroke and falls from dizziness as equally bad. But this is misguided: quality of life can return to a good level even in the case of a hip fracture, but it rarely does after a major stroke.

Data amassed from hundreds of thousands of people in trials of drugs to treat high blood pressure show that stroke is exquisitely sensitive to reductions in blood pressure. The trick lies in

getting this message out in a way that will reduce the burden of stroke. Most diseases are difficult to prevent because treatment is expensive or risky or because screening tests are either inadequate or too expensive to scale up for a population. But treatment for high blood pressure is not expensive. Screening is not difficult, expensive or invasive; the tool is a simple blood-pressure cuff. To protect the brain, pump it up! ■

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