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Lowering blood pressure below currently recommended targets reduces risk of stroke, heart attack

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Using intensive treatment to [lower blood pressure](#) below currently recommended targets significantly reduces rates of major cardiovascular events like stroke and heart attack among a wide range of high-risk patients, according to a large meta-analysis involving almost 45000 individuals, published in *The Lancet*.

A recent US study in patients with diabetes cast doubt on the benefits of intensive blood pressure lowering. But this analysis of all trials shows benefits in a range of patients, not just those with diabetes.

"A key finding was the consistency of findings across major patient groups—those with cardiovascular disease, diabetes, renal disease and also those with just hypertension," explains co-author Professor Jicheng Lv, from Peking University First Hospital, Beijing, China.

More intensive management of high blood pressure achieved an average 7.0 mmHg lower systolic blood pressure and reduced risk of heart attacks by about 14% and stroke by roughly a quarter compared to standard treatment. Based on these findings the authors call for revision of current clinical guidelines for patients who are already at high risk of having heart attack or stroke such as those with cardiovascular disease, kidney disease, or diabetes.

"Several major clinical guidelines on managing high blood pressure, including those of NICE and the European Society of Hypertension, have recently raised blood pressure targets from 130/85 mmHg to 140/90 mmHg for high-risk patients. But our robust evidence clearly shows that treating blood pressure to a lower level than currently recommended targets results in better health outcomes for patients," explains lead author Anthony Rodgers, Professor of Global Health at The George Institute of Global Health, Sydney, Australia.

"This is a really important area—cardiovascular deaths are our leading killer, most occur in high risk people who have already had a 'warning sign' and most occur among people with blood pressure levels which have, until now, widely been regarded as acceptable," adds Professor Lv.

Treating high blood pressure is known to be closely associated with health in high-risk patients. But whether more intensive blood pressure lowering reduces the risk of major events like heart attack and stroke has been hotly debated. Research so far has produced conflicting results.

To address this uncertainty, the researchers did a systematic review and meta-analysis of all randomised trials comparing different blood pressure targets from 1950 up to the end of October 2015. In particular, they examined the potential benefits and safety of additional blood pressure lowering in high-risk individuals whose systolic blood pressure was under the current target of 140mmHg.

Analysis of 19 trials involving 44989 individuals showed that average systolic blood pressure was 6.8 mmHg lower and diastolic blood pressure 4.5 mmHg lower (on average 133.2/76.4 mmHg vs 140.4/80.9 mmHg) in patients who received more intensive treatment compared to those given a standard regimen.

Overall, the findings showed that intensive treatment reduced heart attacks by about 14% and stroke by around a quarter compared with less intensive regimens. Progressive retinopathy (damage to the retina of the eye) was also reduced by about a fifth. The absolute benefits were greatest in trials in which all patients had vascular disease, kidney disease, or diabetes. The reductions in disease were similar regardless of age or blood pressure before treatment. Although there were encouraging trends, more intensive treatment had no clear effect on risk of heart failure, cardiovascular death, end stage kidney disease, or life expectancy.

Blood-pressure lowering treatment was well tolerated, with serious adverse events occurring in similar numbers of individuals in both intensive and standard treatment groups. However, more intensive treatment almost tripled the risk of hypotension (abnormally low blood pressure), including severe episodes of hypotension compared with standard regimens (table 3). There was no evidence of a higher dropout rate in the more intensive treatment group compared to the standard group.

According to Professor Rodgers:

These adverse effects are important but do not outweigh the benefits of lowering blood pressure using intensive treatment in high-risk patients. However, much more research is needed to determine how best to easily and safely achieve and maintain greater blood pressure reductions. Improving treatment rates and long-term adherence is critical for the success of any intervention. Patients are also likely to benefit non-drug approaches such as weight loss and restricting salt intake.

Writing in a linked Comment, Mattias Brunström and Bo Carlberg from Umeå University, Umeå, Sweden say:

Xie and colleagues' systematic review provides strong evidence that intensive blood pressure reduction is more beneficial than less intensive blood pressure reduction. This finding will pave the way for the treatment of a large number of additional patients compared with the number treated at present. About a third of all excess cardiovascular mortality attributable to increased blood pressure is within the normotensive range. Hence, with the numbers needed to treat presented by Xie and colleagues (94 for high-risk patients and 186 for all other included patients), this finding will be of great interest from the point of view of public health, and probably beneficial from a health economic perspective.

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