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Blood Pressure and Stroke Risk Gets More Complicated

Low systolic blood pressure may actually boost chances of recurrent stroke

For patients who have suffered an ischemic stroke, traditional treatment prescribes keeping subsequent blood pressure levels as low as possible to reduce the risk of another stroke. A new international study, however, suggests this conventional approach may not be helpful, and could actually increase recurrent stroke risk – at least in the first few months after the first event.

Bruce Ovbiagele, MD

The findings, from a team of scientists led by Bruce Ovbiagele, MD, professor of neurosciences at the University of California, San Diego School of Medicine, are published in the November 16 issue of *JAMA,* the *Journal of the American Medical Association*.

The 5-year study examined the cases of 20,330 patients (age 50 years and older) at 695 centers in 35 countries who had suffered a recent non-cardioembolic ischemic stroke, which is caused by drifting blood clots formed outside of the heart. Patients were categorized by their average Systolic blood pressure (SBP) level: very low-normal (less than 120 mmHg), low-normal (120 to less than 130 mm Hg), high-normal (130 to less than 140 mm Hg), high (140 to less than 150 mm Hg) and very high (150 mm Hg or greater).

The occurrence rate for the primary or first stroke was highest in patients with a very high SBP (14.1 percent), followed by patients with high SBP (8.7 percent). Next came patients with very low-normal SBP at 8 percent, low-normal SBP at 7.2 percent and then high-normal SBP at 6.8 percent. The occurrence rate for a second stroke or other vascular event followed the same pattern.

SBP is the maximum pressure applied to arterial walls as blood is pumped through the body. Diastolic blood pressure (DBP) is the minimum. Typically, normal blood pressure is defined as less than 120 mm Hg for SBP and less than 80 mm Hg for DBP.

“For most patients at high vascular risk, including diabetics, the general approach has been that much lower is much better,” said Ovbiagele. “For stroke patients, whose condition is most strongly related to elevated blood pressure, it has been believed that much, much lower is much, much better, and that the relationship of SBP with stroke was likely a linear one.”

The new findings indicate the association between blood pressure and stroke risk is more complicated than previously suspected. While the researchers said it was not surprising to find that higher-than-normal SBP levels boosted recurrent stroke risk, it was somewhat unexpected to discover the same effect among patients with very low SBP levels.

The apparent narrowing of what constitutes a “healthy” SBP for stroke patients may not be the only relevant factor. Ovbiagele said timing also appears to be important because the effects were most pronounced in the first six months after the primary stroke.

“It’s conceivable that the brain may still require a certain threshold of blood perfusion early-on after the index vascular brain injury and so is susceptible to more strokes if SBP dips below that threshold. This is just a theory, but there are a couple of other clinical studies that suggest early BP reduction after an acute stroke may be associated with some harm.”

Ovbiagele said the message to patients and clinicians is that “it increasingly appears there is no one-size-fits-all approach with regard to treating blood pressure to prevent stroke. This study and other recent data now suggest that there are several factors to take into consideration when lowering blood pressure to prevent stroke, including the age of the patient, level of blood pressure, any history of prior stroke, type of prior stroke and timing of prior stroke.”

Co-authors of the study are Hans-Christopher Diener, Department of Neurology, University of Duiberg-Essen, Germany; Salim Yusuf, Population Health Research Institute, McMaster University, Canada; Renee H. Martin, Division of Biostatistics and Epidemiology, Department of Medicine, Medical University of South Carolina; Daniel Cotton and Richard Vinisko, Boehringer Ingelheim Pharmaceuticals Inc, Connecticut; Geoffrey A. Donnan, National Stroke Research Institute, University of Melbourne, Australia; Philip M. Bath, Stroke Trials Unit, University of Nottingham, England.

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