The Timing of the Blood Pressure Measurement May Affect the Result in Patients With Acute Stroke

To the Editor:

I have read the article by M Willmoth et al (Hypertension 2004;43:18–24) in which a high blood pressure in acute stroke patients was associated with poor outcome, with great interest. I wonder, however, why the blood pressure timing, even though recorded, was not included in the analysis. Some have reported that blood pressure spontaneously decreased in the first hours after stroke onset in patients with mild to moderate stroke.1,2 Consequently, the timing of the blood pressure measurements may affect the results.

It might be an oversimplification to pool blood pressure data from patients with acute stroke within a period of 7 days. In most patients blood pressure rapidly declines after admission, possibly as a consequence of the passing stress of admission. On the contrary, blood pressure in patients with cerebral herniation increases. In patients with essential hypertension higher blood pressure is found at all times.

I agree with the authors that the hypothesis that blood pressure reduction in acute stroke should be tested in large randomized trials. In my opinion it would improve the quality of both observational studies and clinical trials concerned with blood pressure in acute stroke to include the timing of blood pressure measurement in the analysis, because otherwise we may mix up different biological mechanisms.

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Response: High Blood Pressure in Acute Stroke and Subsequent Outcome: A Systematic Review

The timing of blood pressure (BP) measurement is one of several factors that may confound the association between BP and outcome in acute stroke. It was not possible to account for time in our systematic review1 because it was based on summary (or aggregate) data from each study. Although the studies gave average time to measurement, the range was often wide, encompassing hyperacute, acute, and sub-acute phases of stroke; for example, 1 study included patients presenting between 1 and 168 hours (mean 17 hours) after the onset of stroke.2 A meta-analysis based on individual patient data would be required to allow time to be adjusted for in assessing the BP-outcome relationship, as was done for secondary prevention in the INDANA study.3 Nevertheless, such an analysis of observational studies in acute stroke would be challenging since some of the included articles were published more than 40 years ago and the raw data are unlikely to still exist. However, the ongoing Blood Pressure in Acute Stroke Collaboration (BASC)4,5 is performing a meta-analysis of individual patient data from randomized controlled trials where blood pressure has been altered and will be able to contribute further to this issue.

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