High-Normal Blood Pressure and Cognition: Supplying the Missing Data

To the Editor:

In the March 2008 issue of Hypertension, Knecht et al report that high-normal blood pressure is associated with poor cognitive performance. Predicted means of a global cognitive performance measure were plotted against mean systolic blood pressure (BP; SBP) values for a sample (N=1100; mean age: 64 years) defined as high-normal BP. Other sample characteristics have been described in detail previously. Antihypertensive drugs at wave 6; and SBP range: 90 to 140 mm Hg (mean: 121 mm Hg; SD: 12.1 mm Hg). Other sample characteristics have been described in detail previously. Antihypertensive drug treatment by BP interactions for all of the cognitive performance measures were nonsignificant (P<0.10). Using the basic model and global performance as an illustration, every 10-mm Hg increment in SBP was related to a 0.075-SD decrement in cognitive performance. The 95% CI was −0.12 to 0.02. Our results indicate that SBP-related cognitive performance decreases from the lowest BP grouping to 160 to 170 mm Hg. The Table shows the relation between 10-mm Hg increments in mean SBP and cognitive performance in SD units. Increments in SBP were inversely related to the level of cognitive performance. The fewest number of cognitive variables related to performance was obtained with adjustment for the basic plus risk factors plus antihypertensive drugs treatment model: global performance, verbal memory, and working memory.

Given that our analyses were confined to the participants with normal to high-normal BP, we can estimate decrements in cognitive performance relative to each 10-mm Hg increment in SBP. Using the basic model and global performance as an illustration, every 10-mm Hg increment in SBP was related to a 0.075-SD decrement in cognitive performance. The 95% CI was −0.12 to 0.02. Our results indicate that SBP-related cognitive

Knecht et al note that the inverse relation between SBP and cognition passes through the range of BP values (Figure 2), but they did not relate SBP to cognitive performance in analyses limited to only those persons within the range of systolic and diastolic BP values, analyses that are necessary to more precisely estimate the decrement in cognitive performance for persons within the normal BP range. Knecht et al measured SBP and cognition concurrently at a single examination, a limitation that they note. Although data on several characteristics have been described in detail previously. Antihypertensive drug treatment by BP interactions for all of the cognitive performance measures were nonsignificant (P<0.10); thus, the treated and untreated individuals were combined in the analyses. Our statistical analyses included sets of covariates used by Knecht et al: (1) basic set (sex, age, and education); (2) basic set plus risk factors (body mass index plus alcohol consumption plus cigarettes plus total cholesterol); and (3) basic set plus risk factors plus antihypertensive drugs (yes or no).

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Table. Regression Coefficients (β) and SEs Showing the Inverse Relation Between Mean SBP (in 10-mm Hg Increments) and Cognitive Performance Measures (z Scores)

<table>
<thead>
<tr>
<th>Cognitive Domain</th>
<th>Basic Model</th>
<th>Basic + Risk Factors Model</th>
<th>Basic + Risk Factors + Treatment Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>SE</td>
<td>β</td>
</tr>
<tr>
<td>Global score</td>
<td>−0.075†</td>
<td>0.027</td>
<td>−0.070†</td>
</tr>
<tr>
<td>Verbal memory</td>
<td>−0.078†</td>
<td>0.030</td>
<td>−0.093†</td>
</tr>
<tr>
<td>Working memory</td>
<td>−0.093†</td>
<td>0.032</td>
<td>−0.080†</td>
</tr>
<tr>
<td>Abstract reasoning</td>
<td>−0.068†</td>
<td>0.031</td>
<td>−0.053</td>
</tr>
<tr>
<td>Visual-spatial organization/memory</td>
<td>−0.063†</td>
<td>0.029</td>
<td>−0.061†</td>
</tr>
<tr>
<td>Scanning and tracking</td>
<td>−0.009</td>
<td>0.027</td>
<td>0.002</td>
</tr>
</tbody>
</table>

*P<0.01. †P<0.05.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart Lung and Blood Institute or the National Institutes of Health. This research was approved by the institutional review board of the University of Maine, and informed consent was obtained from all of the participants.

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deficits within the normal BP range are modest from a clinical perspective. However, even these small deficits are important in terms of attributed risk for lowered cognition in the population.

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Disclosures
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