Response to Letter by Abbas et al

Drs Abbas and Corea address the effect of heart rate on resistive index (RI) measurement. We agree that hemodynamic variables may influence the RI measurement. However, the mentioned work from Mostbeck et al determined the influence of heart rate in the renal segmental arteries and not in the internal carotid artery. The small study comprised 8 patients only. Although the application of these results from the renal flow bed to the carotid flow bed seems to be rational, no validated data exist for RI correction in the internal carotid artery. Furthermore, since the publication of Mostbeck’s correction formula 15 years ago, neither in clinical practice, nor in large clinical trials, this correction formula for the RI in the renal arteries is routinely applied. In an important study concerning the prognostic value of RI in renal artery revascularization, Radermacher et al did not use this correction formula. Nevertheless, we have additionally calculated all statistics with the Mostbeck formula. The correction formula influenced none of the results because its impact in the range of normal heart rate is minimal. In all day practice, the formula will at best help in correcting RI values in brady- or tachycardia.

Concerning the influence of arterial fibrillation, Radermacher et al did not exclude patients with arterial fibrillation either. Moreover, in our study no significant difference in the mean value of RI measurements between the subgroup with atrial fibrillation and the general study population was found. Each RI value of our study was an average of 6 different measurements compensating obvious differences in R-R-time attributable to atrial fibrillation with corresponding fluctuations in end-diastolic velocities.

The suggested use of a structural and functional surrogate marker obtained by the sum of the measurement of RI and intima-media thickness (IMT) in the carotid artery may be an obvious approach. Interestingly, our preliminary calculations before publication revealed no increase of diagnostic yield by combining RI and IMT values. Furthermore, it should be noted that for precise IMT measurement a 10-MHz probe is mandatory. In contrast, the widespread use of 5- to 7-MHz probe for routine examinations of the carotid region is an accurate tool for the measurement of RI.

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Stroke. 2006;37:1645; originally published online June 1, 2006;
doi: 10.1161/01.STR.0000227250.13225.fc
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
http://stroke.ahajournals.org/content/37/7/1645

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