Response to Analysis of Carotid and Ophthalmic Flow Velocity Waveforms

To the Editor:

The authors are indebted to O’Rourke and Hirata1 for their valuable comment to our publication “Fourier Analysis of the Envelope of the Ophthalmic Artery Blood Flow Velocity: Age- and Blood Pressure–Related Impact”.2 We bewail if the impression should have occurred that only local vessel properties have been considered responsible for the effect observed. We want to use the opportunity to point out that we agree with the presented influence of the reflected waves from the lower body on the local vasculature of the eye.

However, in blood flow regulation to the eye, an important regulatory role of the different endothelium-derived vasoactive substances in the extraocular ophthalmic circulation has been suggested.3 That is, it was reported that the human ophthalmic artery exhibits a basal release of NO, indicating that the human ophthalmic circulation normally is in a state of constant vasodilation.4 In arterial hypertension this and other protecting mechanisms of the ocular circulation may be deranged as a result of endothelial dysfunction, whereas the reactivity of vascular smooth muscle may be normal, increased, or reduced.5 Thus, a certain contribution of the locally affected vascular tone to the envelope waveform of the blood flow velocity occurs in arterial hypertension, which, however, may be much smaller than the reflected waves from the lower body.

Future studies should examine whether pharmacological interventions in the local metabolism (NO, bradykinin, or endothelin-1) may unmask the hidden secrets in the flow waveforms.

Sources of Funding

This study has been supported by the Deutsche Forschungsgemeinschaft, Bonn, Germany (Sonderforschungsbereich SFB 539 BI.1, Glaukome einschliesslich PEX).

Disclosures

None.

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Hypertension. 2008;51:e19; originally published online January 28, 2008;
doi: 10.1161/HYPERTENSIONAHA.107.102525

Hypertension is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0194-911X. Online ISSN: 1524-4563

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://hyper.ahajournals.org/content/51/3/e19

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