Response to Letter Regarding Article, “Near Infrared Spectroscopy for the Detection of Desaturations in Vulnerable Ischemic Brain Tissue: A Pilot Study at the Stroke Unit Bedside”

Response:
We thank Freeman and Taussky for their comments on our study. We agree that near infrared spectroscopy (NIRS) has several practical advantages over established cerebral blood flow measurement methods like positron emission tomography or CT perfusion. Mainly because of its noninvasiveness, easy bedside application and excellent temporal resolution NIRS is suitable for long-term continuous monitoring on stroke units. The recent finding of Freeman of a strong correlation between bilateral frontal NIRS measurements and corresponding regional cerebral blood flow on CT perfusion imaging is interesting, especially because both techniques were not applied simultaneously (minutes to hours apart). This would indicate that not only relative changes, but also absolute (mean) regional saturation of oxygen values might be of clinical use. This information might have limited usefulness because no clear differences between the (severely) affected and unaffected hemispheres in the 8 neurological patients were detected. In our study with several hours of bifrontal NIRS recording in patients with stroke, significantly more cerebral desaturations were found in the affected hemisphere as time progressed. Several factors may explain these different findings. For instance, the vulnerability of the affected hemisphere may become more apparent with long-term continuous recordings. NIRS seems more sensitive to transient episodes of desaturation because of its ability to monitor over many hours, as opposed to (CT) perfusion imaging techniques. A next step would be to elucidate the mechanisms of local arteriovenous desaturations. Coregistration of different physiological parameters such as peripheral arterial oxygenation, CO2, blood pressure, (if possible) intracranial pressure, cerebral blood flow (velocity), and taking into account (permanently or temporarily disturbed) autoregulatory mechanisms and electroencephalographic data would improve the interpretation of the complex NIRS signal.

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Disclosures
None.

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