Letter by Aries et al Regarding Article,
“Optical Bedside Monitoring of Cerebral Blood Flow in Acute Ischemic Stroke Patients During Head-of-Bed Manipulation”

To the Editor:

With interest, we took note of the study of Favilla et al1 of cerebral hemodynamics during head-of-bed (HOB) manipulations in 17 patients with acute ischemic stroke. Although their study with simultaneous measurements of bifrontal diffuse correlation spectroscopy and transcranial Doppler (TCD) improves our understanding of cerebral hemodynamics in the acute stroke stage, we cannot agree fully with the conclusions of the authors. First, their conclusion that no significant effect of HOB movements on TCD monitoring was observed only applies to short-term effects because of the short periods (4.5 minutes) of TCD monitoring in their study. As shown in Figure 1, a slow trend of TCD signals going down at the end of the 30° HOB position recording can be seen. Moreover, this short TCD monitoring interval together with small patient sample size limits study power and thus conclusions on statistical significance. Second, some additional calculations and analyses might improve our understanding of the complex physiological challenge of the performed HOB manipulations. Were there important changes of end-tidal CO2 levels, ventilation rate, or heart rate and might this explain part of the observed paradoxical responses? It is known that more elements of the autonomic system may change during postural change, especially with short measurement segments.2,3 Did the authors use the hydrostatic corrected Finapres blood pressure function to estimate the cerebral perfusion pressure at the level of basal cerebral arteries? Instead of assuming heterogeneity in autoregulatory function, it would be informative to calculate autoregulation estimates (for both hemispheres using the available signals) and see whether this might explain some of the variability.4 Finally, we find it hard to understand what the microvascular cortical compartment represents and what exactly is it influenced by. With correlation spectroscopy detecting moving red blood cells, might this signal also be influenced by the local cerebral venous compartment? In the 30° HOB position, drainage of venous blood toward the heart improves and likely contributes importantly to the observed decrease in correlation spectroscopy signals.

In summary, the study methods and results in its present form seem too preliminary to be used to guide individualized stroke therapy or set up outcome studies. It underscores the importance of inclusion of a healthy control group and to measure multiple variables that could be of potential influence (at least end-tidal CO2) to distinguish between complex normal and abnormal physiology.3

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Disclosures

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