Response to Letter by Fuentes et al Regarding Article, “J-Shaped Association Between Serum Glucose and Functional Outcome in Acute Ischemic Stroke”

Response:
We thank Fuentes et al for their interest in our work and for their comments. We agree that hypoglycemic values occur only rarely at admission in stroke patients. To confirm this further, we performed an updated evaluation of our registry, which showed that between January 2003 and November 2010, there were only 4 patients (0.18%) and 10 patients (0.44%) with admission glucose levels of <3.7 and <4 mmol/L, respectively. The association of hypoglycemic values with unfavorable outcome as described by the J-curve seems to be of little clinical significance because of these small numbers; however, it provides additional pathophysiological insight into the effect of hypoglycemia on outcome. Furthermore, it suggests that physicians treating acute poststroke hyperglycemia with insulin should be careful to avoid iatrogenic hypoglycemia.

Similar to our results, Fuentes et al recently showed that hyperglycemic values above a threshold value of 155 mg/dL at any time during the first 48 hours after admission is associated with unfavorable outcome. Both studies underline the significant effect of poststroke glycemia on stroke outcome. We agree with Fuentes et al that not only admission glucose levels, but also the overall kinetics of glucose during the acute phase, have a significant effect on stroke outcome. However, the association between poststroke glucose levels with outcome seems to be a multifactorial situation that involves several other parameters aside from the glucose levels. The diabetic status of the patient might be of significance; after all, it seems rational that the brain of a patient with previously diagnosed diabetes could be preconditioned to hyperglycemia, and hence could withstand hyperglycemic values more efficiently. This possibility is exemplified by the recent observation that intravenous thrombolysis was shown to attenuate infarct growth in nondiabetics, but not in diabetics. Also, the underlying pathophysiologic stroke mechanism further modulates the effect of poststroke glycemia on outcome; moderate hyperglycemia was shown to be detrimental in nonlacunar stroke, but was beneficial in lacunar stroke.

In conclusion, we believe that additional studies are warranted to identify more effectively the patient subgroups that might benefit from aggressive glucose management, as well as the appropriate glucose thresholds, interventions applied, and targets intended; these should then be tested in randomized, controlled trials.

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