COMMENTS AND RESPONSES

Comment on: Koivikko et al. Autonomic Cardiac Regulation During Spontaneous Nocturnal Hypoglycemia in Patients With Type 1 Diabetes. Diabetes Care 2012;35: 1585–1590

We read with great interest the article published in *Diabetes Care* by Koivikko et al. (1) showing that in patients with type 1 diabetes, spontaneous episodes of hypoglycemia are associated with reduced values of heart rate variability (HRV) parameters, indicating sympatho-vagal imbalance toward sympathetic predominance.

The data by Koivikko et al. confirm in type 1 diabetic patients what we already demonstrated—for the first time—in type 2 diabetic patients (2). In our study we performed simultaneous 48-h electrocardiogram Holter monitoring and continuous interstitial glucose measurements in 12 type 2 diabetic patients with documented stable coronary artery disease. The highest and the lowest glucose levels for each 3-h segment of the 2 days were identified, and HRV parameters were measured on Holter recordings at 5-min intervals centered on the corresponding times. The results showed that HRV parameters (in particular low frequency and high frequency power) were significantly lower in correspondence of the lowest glucose blood levels. Of note, we also showed that the decrease in HRV parameters in association with the lowest glucose blood levels was abolished or significantly blunted in those who were taking β-blocking agents, suggesting that these drugs might contrast the hypoglycemia-induced cardiac sympatho-vagal imbalance with potential protective effects.

In the last years, several studies have fueled the relationship between hypoglycemia and cardiovascular death (3). By activating sympathetic activity, hypoglycemia might trigger life-threatening ventricular arrhythmias and sudden cardiac death, which might be favored by an increased arrhythmogenic substrate, as in case of severe coronary artery disease or impaired left ventricular function (4). Acute vascular complications and thrombosis, however, also might be triggered by the hypoglycemia-mediated activation of adrenergic activity (5).

Our data (2) and those by Koivikko et al. (1) suggest a potential way to assess the hypoglycemia-related risk. Only prospective studies, however, may establish whether the depressed hypoglycemia related HRV is actually associated with an increased risk of acute cardiovascular events, and whether interventions aimed at avoiding the hypoglycemia-related sympatho-vagal imbalance, as we showed for β-blockers, may reduce this risk.

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