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GLYCEMIC VARIABILITY AND CARDIOVASCULAR OUTCOMES

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Abstract

Diabetes increases the risk of cardiovascular diseases. Although chronic hyperglycemia is a major determinant of macrovascular complications in diabetes, glycemic variability (GV) and hypoglycemia have also a strong influence on the cardiovascular system. GV relates to fluctuations in glycemia and reflects risk of hypoglycemia. The GV is associated with pancreatic beta cell function, and GV is more increased in Type 1 diabetes (T1D) compared with Type 2 diabetes (T2D). Diabetes Control and Complication Trial (DCCT) showed that the maintenance of higher C-peptide secretion, irrespective of the insulin treatment, led to a lower frequency of hypoglycemic events and microvascular complications in T1D. We also found that T1D was associated with higher risk for MI, atrial fibrillation, hospitalized heart failure, and death compared with T2D using the Korean National Health Insurance Service database. Previous studies reported that GV assessed by continuous glucose monitoring (CGM) significantly correlated with endothelial dysfunction, measured by brachial-artery flow-mediated dilation and carotid intima-media thickness, in diabetic patients. Furthermore, GV predicted rapid progression of coronary plaque in patients with acute coronary syndrome (ACS). In another observational study, GV was associated with the presence and severity of CAD, in patients with newly diagnosed type 2 diabetes (T2D). Moreover, a longitudinal study reported that GV assessed by CGM is a predictor of long-term prognosis in patients with ACS without severe diabetes. We also reported that GV assessed by CGM is associated with cardiovascular autonomic neuropathy in T1D and T2D. In this lecture, recent studies related with GV and CV outcomes will be summarized and possible strategies to reduce GV will be discussed.

Keywords

Glycemic variability, continuous glucose monitoring, cardiovascular outcome