Hypoglycemic episodes increase the risk of ventricular arrhythmias and sudden cardiac arrest in patients with type 2 diabetes - a nationwide cohort study

Authors:
YC Hsieh¹, YC Liao¹, CH Li¹, JC Lin², CJ Weng¹, CC Lin³, CP Lo⁴, KC Huang⁵, JL Huang¹, CH Lin³, TJ Wu¹, WH Sheu⁶, ¹Taichung Veterans General Hospital, Cardiovascular Center - Taichung - Taiwan, ²Chiayi Branch, Taichung Veterans General Hospital, Department of Internal Medicine - Chiayi - Taiwan, ³Taichung Veterans General Hospital, Department of Medical Research - Taichung - Taiwan, ⁴Providence University, Department of Financial Engineering - Taichung - Taiwan, ⁵Providence University, Department of Financial Engineering - Taichung - Taiwan, ⁶Taichung Veterans General Hospital, Division of Endocrinology and Metabolism, Department of Medicine - Taichung - Taiwan.

Topic(s):
Arrhythmias, General – Epidemiology, Prognosis, Outcome

Citation:
Background: Hypoglycemic episode (HE) increases the risk of cardiovascular mortality. The impact of HE on the risk of sudden death remains unclear. We hypothesized that HE increases the risks of ventricular arrhythmia (VA) and sudden cardiac arrest (SCA), and that anti-diabetic agents (ADAs) causing hypoglycemia also increase the risks of VA and SCA.

Methods: Patients aged ≥20 years with newly diagnosed diabetes were identified from the Taiwan National Insurance Database. HE was defined as the presentation of hypoglycemic coma or specified/unspecified hypoglycemia. For control group, we included diabetic patients without HE, and they were frequency-matched to the HE group at a 4:1 ratio. The primary outcome was the occurrence of any event of VA (including ventricular tachycardia and fibrillation) and SCA during the defined follow-up periods. Multivariate Cox hazards regression model was used to evaluate the hazard ratio (HR) for VA or SCA.

Results: A total of 54,303 diabetic patients were screened with 1,037 of them in the HE group, and 4,148 in the control group. During a mean follow-up period of 3.3±2.5 years, 29 VA/SCA events had occurred. Compared to the control group, the HE group had a higher incidence of VA/SCA (adjusted HR: 2.42, p =0.04). Diabetic patients medicated with insulin for glycemic control increased the risk of VA/SCA compared to those without insulin (adjusted HR: 3.05, p=0.01).

Conclusions: HEs in patients with diabetes increased the risks of VA and SCA compared to those without. Their use of insulin also independently increased the risk of VA/SCA.
Hypoglycemic episodes increase the risk of ventricular arrhythmias and sudden cardiac arrest in patients with type 2 diabetes—a nationwide cohort study.

Authors: YC Hsieh 1, YC Liao 1, CH Li 1, JC Lin 2, CJ Weng 1, CC Lin 3, CP Lo 4, KC Huang 5, JL Huang 1, CH Lin 3, TJ Wu 1, WH Sheu 6

1 Taichung Veterans General Hospital, Cardiovascular Center—Taichung—Taiwan, 2 Chiayi Branch, Taichung Veterans General Hospital, Department of Internal Medicine—Chiayi—Taiwan, 3 Taichung Veterans General Hospital, Department of Medical Research—Taichung—Taiwan, 4 Providence University, Department of Financial Engineering—Taichung—Taiwan, 5 Providence University, Department of Financial Engineering—Taichung—Taiwan, 6 Taichung Veterans General Hospital, Division of Endocrinology and Metabolism, Department of Medicine—Taichung—Taiwan.

Topic(s): Arrhythmias, General—Epidemiology, Prognosis, Outcome

Citation:

Background: Hypoglycemic episode (HE) increases the risk of cardiovascular mortality. The impact of HE on the risk of sudden death remains unclear. We hypothesized that HE increases the risks of ventricular arrhythmia (VA) and sudden cardiac arrest (SCA), and that anti-diabetic agents (ADAs) causing hypoglycemia also increase the risks of VA and SCA.

Methods: Patients aged ≥20 years with newly diagnosed diabetes were identified from the Taiwan National Insurance Database. HE was defined as the presentation of hypoglycemic coma or specified/unspecified hypoglycemia. For control group, we included diabetic patients without HE, and they were frequency-matched to the HE group at a 4:1 ratio. The primary outcome was the occurrence of any event of VA (including ventricular tachycardia and fibrillation) and SCA during the defined follow-up periods. Multivariate Cox hazards regression model was used to evaluate the hazard ratio (HR) for VA or SCA.

Results: A total of 54,303 diabetic patients were screened with 1,037 of them in the HE group, and 4,148 in the control group. During a mean follow-up period of 3.3±2.5 years, 29 VA/SCA events had occurred. Compared to the control group, the HE group had a higher incidence of VA/SCA (adjusted HR: 2.42, p = 0.04). Diabetic patients medicated with insulin for glycemic control increased the risk of VA/SCA compared to those without insulin (adjusted HR: 3.05, p=0.01).

Conclusions: HEs in patients with diabetes increased the risks of VA and SCA compared to those without. Their use of insulin also independently increased the risk of VA/SCA.