Archives of Anesthesiology and Critical Care (In Press); x(x): xx-xx.

Available online at http://aacc.tums.ac.ir

Letter to Editor

Unexplained Tachycardia in a Diabetic Patient after Induction: Hypoglycemia, a Commonly Overlooked Cause

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ARTICLE INFO

Article history:
Received 29 November 2025
Revised 21 December 2025
Accepted 05 January 2025

The incidence of diabetic patients undergoing surgery is estimated to be around 25%. Tachycardia or ventricular tachyarrhythmias during general anesthesia (GA) commonly raise suspicion of lighter anesthetic planes, pain, or hypovolemia. However, in long-standing diabetics on short-term insulin therapy, hypoglycemia may be an overlooked intraoperative cause. The purpose of this case report is to present an uncommon occurrence of tachyarrhythmias due to a sudden drop in blood glucose during general anesthesia in a patient with type 2 diabetes mellitus. This highlights the need to raise awareness about the risk of post-anesthesia hypoglycemia in elderly patients and to adopt anesthetic strategies that help prevent related complications. Additionally, it offers a basis for future research exploring hypoglycemia as a potential adverse effect associated with anesthesia or opioid use.

We encountered a 52-year-old male diagnosed with type 2 diabetes mellitus for seven years with poor glycemic control (HbA1c 7.3%) optimized with Human Actrapid Insulin (HAI) three days before surgery. He was scheduled for endoscopic combined intrarenal surgery (ECIRS) for bilateral renal calculi under GA. Preoperative investigations like liver function tests, electrolytes, kidney function tests, ECG, chest X-ray, 2D echocardiography, and blood sugar were within normal limits. Consent was taken, and the patient was wheeled into OT. After attaching standard ASA monitors, induction was done with Inj. Fentanyl (2 mcg/kg), Inj. Propofol (2 mg/kg), Inj. Vecuronium (0.1 mg/kg), and a smooth tracheal intubation. Intraoperatively, the patient developed 15-20 beats of ventricular tachycardia (VT) followed by tachycardia with 148-162 bpm, despite a deep plane of anesthesia monitored by a bispectral index monitor (BIS=54), stable blood pressure, normocapnia, and no evidence of hypovolemia. Two doses of intravenous injection. Lignocaine 50 mg was given with no effect. A random blood glucose measurement revealed 44 mg/dL. An infusion of 250 mL of 5% dextrose normal saline (DNS) was started, and the heart rate decreased to 85–90 beats/min within three minutes. There were no further rhythm changes throughout the procedure.

Opioids such as fentanyl have been reported to cause hypoglycemia through various mechanisms, including increased glucose utilization by liver cells and skeletal muscles, promotion of insulin release, and impairment of the counter-regulatory response [1-2]. Experimental studies in rats show that fentanyl can inhibit glucose-stimulated insulin release from pancreatic islets, suggesting a potential role in destabilizing intraoperative glucose homeostasis [3]. This mechanism provides biological plausibility for fentanyl contributing to hypoglycemia in patients with type 2 diabetes, prolonged fasting, or depleted glycogen stores under GA.

Although increased catecholamine response during hypoglycemia is well studied, it often goes uncorrected under GA. The only sign of sympathetic activation may

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be tachycardia or VT—especially in patients with changes of diabetic autonomic neuropathy (DAN).

Hypoglycemia usually manifests as sweating, tremors, or agitation due to adrenergic discharge and catecholamine release. Under GA, these signs are masked, leaving heart rate as the only observable clue. In DAN, cardiovascular responses are often unpredictable—Moningi et al. described loss of heart rate variability and severe cardiovascular autonomic neuropathy, and Oakley & Emond reported an unpredictable, exaggerated, or blunted hemodynamic response during anesthesia [4-5]. While Tian et al. documented intraoperative hypoglycemia, tachycardia as its sole manifestation has not been reported [6]. The rapid reversion of the ventricular tachycardia with the correction of the severe hypoglycemia led to a suspicion that hypoglycemia had been the underlying cause [7].

This case underscores the lack of sufficient research on hypoglycemia during general anesthesia, highlighting the need for further investigations to better understand its mechanisms, incidence, and perioperative consequences. This report is to increase awareness of the observation that in diabetic patients, especially those on short-term insulin therapy, unexplained intraoperative tachycardia should prompt a random blood glucose test. Awareness of this subtle presentation may prevent catastrophic neuroglycopenic sequelae.

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