

Case Report

The Heart was Hungrier than the Brain: Hypoglycemia-induced Ventricular Tachycardia in a Conscious Diabetic PatientNavgeet Mathur^{1*}, Medha Mathur², Anjana Verma³¹MD, Associate Professor, Department of General Medicine, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India²MD, Associate Professor, Department of Community Medicine, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India³MD, Associate Professor, Department of Community Medicine, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India**Corresponding Author:** Dr. Navgeet Mathur, E-mail: mathurdnavgeet@gmail.com**ARTICLE INFO***Article history*

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ABSTRACT

This case report is about a 58 years old male diabetic patient presented multiple times at outdoor (OPD) for routine follow up of diabetes always in asymptomatic, fully conscious, and oriented condition, and on multiple occasion of his OPD visit, he was found to have ventricle tachycardia (VT) on ECG with concurrent hypoglycemia (blood sugar <60 mg/dl). No antiarrhythmic treatment was needed because ventricle tachycardia subsided immediately after correction of hypoglycemia on each and every time he is having it, thus favoring hypoglycemic etiology of VT. Every time patient was having documented hypoglycemia, his heart always showed concurrent VT but the brain never showed altered consciousness or disorientation. It seems like his heart was more hungry than his brain. After an extensive search, no similar case report was found having only isolated VT at each and every episode of documented hypoglycemia. Glucose is the main fuel for the human brain. Higher mental functions were well tolerant to hypoglycemia but his heart used to respond quickly in form of VT.

INTRODUCTION

Diabetes had multiple complications and its therapy especially with insulin and sulfonylureas may lead to hypoglycemia. Hypoglycemia is a dreadful condition that needs to identify and treat early to minimize danger to life. Hypoglycemia may present as a variety of signs and symptoms. Rare presentations of hypoglycemia are important to know. This case report included a rare case report of hypoglycemia-induced isolated ventricular tachycardia. Metabolic causes in the case of ventricular tachycardia need to rule out like hypoglycemia, electrolyte disturbances, hypoxemia, toxins, drugs etc. This case report enlightens diagnostic and treatment approach of a rare presentation of hypoglycemia.

CASE REPORT

A 58 years old male Hindu patient, bakery shopkeeper by occupation, and resident of Jaipur, Rajasthan was diabetic for the past 10 years. At the time of the presentation, he was fully conscious, oriented, and was asymptomatic. There was no complaint of confusion, giddiness, excessive sweating, palpitation. He was on anti-diabetic medication including the combination of glimepiride 2 mg and metformin 1000mg once a day in the morning and the combination of

vildagliptin 50 mg and metformin 500 mg in the evening before the visit. He was taking irregular treatment and having an irregular dietary pattern. He often skipped scheduled medication or meals at their usual time. There was no history of any drug or substance abuse. He was advised to have ECG and random blood sugar for a quick routine assessment. ECG was showing ventricular tachycardia and blood sugar was 54 mg/dl. He had a history of skip meals last night. Immediately 100 ml 25% dextrose fast infusion was given twice back to back and blood sugar was improved to 106 mg/dl and as soon as his blood sugar recovered, ventricle tachycardia was converted into normal sinus rhythm with no ischemic changes of ST-segment and T wave or any other significant abnormality. Reverted ECG had normal QT and QTc interval (280 & 329 msec respectively). He was admitted for further monitoring and evaluation. He was evaluated by routine investigations like complete blood count, serum electrolytes, renal and liver function test, Hb A1C, chest x-ray, ophthalmic and cardiac evaluation with regular blood sugar and ECG monitoring. No significant abnormality was found on subsequent serial ECG, cardiac markers, 2D echo heart, and in routine investigations. HbA 1C level was 9.0%. After 4 days he was discharged with the combination of glimepiride 1 mg and metformin 1000mg once a day in the

morning and a combination of vildagliptin 50 mg and metformin 1000 mg in the evening after finding fair control of blood sugar by them and a vitamin B complex capsule once a day was added to treat any underlying autonomic or peripheral neuropathy. He was well counseled about the timing of medication and meals, dietary and lifestyle modification, symptoms, and home management of hypoglycemia. He was advised to self-monitoring of blood sugar at home.

The patient remained on a regular monthly check-up later. Blood sugar and ECG were monitored at every visit. There was a persistent habit of skip medication and diet. After 4 months patient came with the same presentation of hypoglycemia and VT at ECG. The patient was fully conscious and oriented. This time patient also had a history of nausea last night and skip of night meals. Nausea was relieved spontaneously after 3 hours. Again ventricle tachycardia was settled quickly to normal sinus rhythm with no significant abnormality after correction of blood sugar by 25% dextrose infusion. Again patient was admitted and discharged after 3 days with counseling about the need for a proper meal with sulfonylurea medication. Hb A1C was 8.5%.

The patient had a similar episode of VT again with hypoglycemia after 2 months of the last episode and treated similarly (Figures 1 and 2). He recovered immediately after the correction of blood sugar. The patient was fully conscious

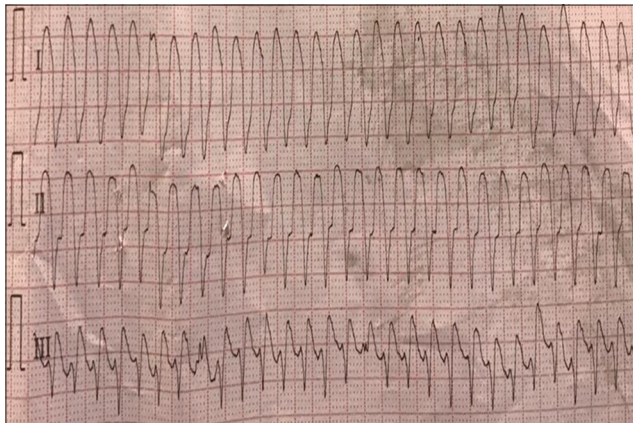


Figure 1 and 2. ECG showing ventricular tachycardia during hypoglycemia episode

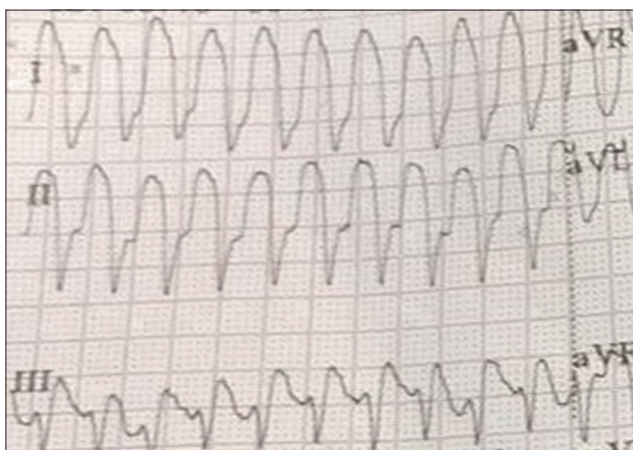


Figure 1 and 2. ECG showing ventricular tachycardia during hypoglycemia episode

and oriented throughout the course. The patient refused admission this time. The patient's treatment was shifted to a combination of vildagliptin 50 mg and metformin 1000mg twice a day. This time sulfonylurea was withdrawn from medication to avoid hypoglycemia. The patient again counseled about self-monitoring of blood sugar at home and about needed dietary and lifestyle modification. On further follow-up of the next 5 months, no such incident was documented again and the patient admitted every time that there was no further skip of medication or meal.

DISCUSSION

This case report has a unique presentation of hypoglycemia. After an extensive search, no case report was found reporting hypoglycemia causing only isolated VT at each and every instance, with no other signs and symptoms.

The underlying connecting mechanisms in hypoglycemia and arrhythmia are still unclear. [1] The mechanism behind hypoglycemia induces cardiac arrhythmia can be defined by lengthening of the corrected QT interval (QT_c) likely due to increased catecholamine release due to sympathoadrenal activation during hypoglycemia and QT_c prolongation could lead to a high risk of ventricular tachycardia. [1-3] Additionally, the effects of hypoglycemia on cardiac autonomic regulation may contribute to high-frequency and low-frequency heart rate. [4] Hyperinsulinemia and increased secretion of catecholamines may lead to hypokalemia during hypoglycemia and may potentiate cardiac repolarizing abnormalities. [2-5]

In this case report, glimepiride was stopped to minimize chances of hypoglycemia, and treatment was shifted to vildagliptin and metformin entirely.

This case report indicates the need for intense counseling of diabetic patients and attendants about risk factors, needed changes in lifestyle and food habits, symptoms of complications and hypoglycemia, home base management of hypoglycemia, medication and side effects, the timing of pills, insulin, and meals. At every visit, they should motivate for self-monitoring of blood sugar. This case study also suggests an assessment of ECG and blood sugar is a must at every visit even if the patient is completely asymptomatic. In the case of ventricular tachycardia besides primary cardiac etiologies, metabolic etiologies also need to rule out like hypoglycemia, dyselectrolytemia, hypoxemia.

CONCLUSION

Hypoglycemia may present as isolated VT in asymptomatic diabetic patients. Correction of hypoglycemia may recover VT immediately without any anti-arrhythmic medication. Metabolic abnormalities need to rule out in case of ventricular tachycardia. This case study also recommends monitoring of blood sugar and ECG of every diabetic patient at every visit even in asymptomatic condition. Self-monitoring of sugar must encourage at every visit. This case report also recommends proper counseling for diabetic patients.

Consent for Publication

Informed written consent was obtained from patient to publish this case.

Ethical approval

Ethical committee approval is not needed in our institute for case reports. The heart was hungrier than the brain: Hypoglycemia-induced ventricular tachycardia in a conscious diabetic patient.

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