

A Refractory Hypoglycemia Successfully Treated With Verapamil

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Introduction

Gastric bypass surgery is the most effective and popular therapy for the treatment of severe obesity with multiple comorbidities. It has multiple short- and long-term complications including post-bariatric hypoglycemia, which is frequently seen years after the surgery. A patient with severe hypoglycemia presents with symptoms like seizures, acute encephalopathy, syncope, and fatal arrhythmias, and hypoglycemia is associated with a high incidence of death [1]. It was found that patients had an increased incidence of accidental deaths after bariatric surgery [2]. Post-bariatric hypoglycemia likely explains the unknown cause of death. Most of the patients with refractory hypoglycemia showed improvement in symptoms after treatment with a calcium channel blocker, Verapamil

Case Report

A 33-year-old female presented with frequent postprandial and early morning hypoglycemia. The patient underwent gastric sleeve surgery 6 years ago. Her preoperative BMI was 41kg/m² and post-operative BMI was 24.3 kg/m². Three years after her surgery, she developed new symptoms of early morning dizziness and hunger. She was found to have low blood sugar readings in the range of 35-70 mg/dl during early morning time. She passed out few times and was treated IV dextrose during those episodes. She was also treated with dietary modifications, acarbose, and prednisone but her symptoms continued. She started having more frequent episodes of brain fog, slurred speech, excessive tiredness, and hence she was admitted for further workup as shown in the Table 1. She underwent a 72-hour fasting test during which her blood glucose was as low as 52 mg/dL with hypoglycemia symptoms.

Table 1: Patient workup:

	Patient	Normal reference
Glucose, mg/dL	75	
Insulin, μ U/mL	3.2	<19.7
Proinsulin, pmol/L	4.5	<18.8
C-peptide, ng/mL	0.55	0.80 -3.85
β -hydroxybutyrate, mg/dL	2.11	0.02-0.27
Growth hormone somatomedin C/insulin growth factor I	normal	5.4
Serum sulfonylurea	negative	negative
Insulin antibody	< 0.4	Normal

Glucagon stimulation test was performed, and plasma glucose increased to 65 mg/dL 30-minute later.

Cosyntropin test showed result as shown in the table 2.

Table 2: Labs before and after cosyntropin test:

Cosyntropin test	Before test value	After test value
Time after meal, h	2.5	2.5
ACTH	<5	11
Cortisol mcg/dL	20.4	30

A computed tomography (CT) scan did not reveal any evidence of a pancreatic mass. She was started on a trial of oral verapamil 20 mg twice daily and had continuous blood glucose monitoring. On the follow-up visit one month later, she reported a decrease in the frequency of hypoglycemic episodes and her blood glucose reading during the episodes of hypoglycemia was in the range of 50 to 55 mg/dl. She did not report any adverse effects of the Verapamil. She was advised to continue Verapamil and monitor blood glucose.

Discussion

Post-bariatric hypoglycemia (PBH) is one of the potential complications of bariatric surgery which occurs years after the surgery and often gets missed or misdiagnosed leading to fatal complications.

The etiology of the PBH is not well known but according to a recent publication, it is thought to be secondary to accelerated delivery of nutrients into the roux limb leading to stimulation of incretin leading to very elevated postprandial glucagon-like peptide 1 (GLP-1) level and supraphysiologic insulin secretion from β -cells [3]. PGH was found mainly in females, usually after several years of procedure, and occurring 1 to 4 hours after eating [4]. Every patient should be tested for glucose, insulin, C-peptide, and proinsulin level with a mixed meal test or meal provocation test [5].

PBH can be treated with dietary modification like frequent, small meals high in protein and fiber and low in fat and carbohydrates. If patients continue to be hypoglycemic despite dietary modification, pharmacologic treatment should be considered. Among different pharmacological treatments, Acarbose has been used as a first-line treatment. In patients in whom Acarbose was not tolerated, Diazoxide and octreotide had considered. Recently, in a few of the case reports, calcium channel blockers together with strict dietary restrictions, acarbose, or both have shown to be effective like in our patient. In those patients not responding to medical therapy, surgical treatment like gastrostomy tube placement, a reversal of gastric bypass anatomy, and distal pancreatectomy were considered in the past.

Conclusion

Any patient presenting with neuroglycopenic and autonomic symptoms is often assumed to be secondary to bariatric surgery and these hypoglycemic episodes get missed leading to adverse events. Any patient with refractory hypoglycemia should be given a trial of calcium channel blockers along with dietary modifications. Our case is additional evidence that monotherapy with verapamil may be sufficient to treat these patients with PBH.

References

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