



Case Report

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Severe Hypoglycemia Due To the Administration of Bromocriptine in a Non-Diabetic Patient: A Case Study

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ABSTRACT

The patient was a 24-year-old man with persistent vegetative state following severe traumatic brain injury due to a car accident, who was referred to the emergency department with a generalized tonic-clonic seizure due to severe hypoglycemia. The patient was treated with phenytoin, levetiracetam, bromocriptine and enoxaparin. The patient was transferred to the Intensive Care Unit (ICU) for accurate monitoring. The patient in the ICU was treated with 100 cc/h of Dextrose 10% plus Intravenous antibiotic to treat urinary tract infection induced sepsis. The previous prescribed medications were also prescribed. Despite proper feeding through PEG tube and receiving 100 cc/h of Dextrose 10%, the patient's blood glucose was dropped frequently below 50 mg/dl and hypertonic glucose infusion was several times required for treatment of hypoglycemia. Administration of bromocriptine as antidiabetic agent was eliminated after consultation with a neurologist surgeon. After bromocriptine discontinuation, hypoglycemia was resolved. In this non-diabetic patient, severe hypoglycemia occurred after administration of bromocriptine, which was an unusual complication in the non-diabetic patient treated with bromocriptine.

Summary

The patient was a 24-year-old man in a persistent vegetative state following severe traumatic brain injury due to a car accident. He was referred to the Emergency Department with a generalized tonic-clonic seizure

because of his severe hypoglycemia. The patient was treated with phenytoin, levetiracetam, bromocriptine, and enoxaparin. He was transferred to the Intensive care unit for better monitoring and was treated with 100 mL/h of dextrose 10% plus intravenous antibiotic to treat his urinary tract infection-induced sepsis. The patient's former medications were re-administered to him.

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Despite his proper feeding through a percutaneous endoscopic gastrostomy tube and receiving 100 mL/h of dextrose 10%, the patient's blood glucose dropped to below 50 mg/dL several times and hypertonic glucose infusion was administered several times for the treatment of his hypoglycemia. The administration of bromocriptine as an antidiabetic agent was eliminated after consultation with a neurologist surgeon. After bromocriptine discontinuation, his hypoglycemia was resolved. In this non-diabetic patient, severe hypoglycemia had occurred after the administration of bromocriptine, which was an unusual complication in non-diabetic patients treated with this medication.

Case Presentation

The patient was a 24-year-old man in a persistent vegetative state following severe traumatic brain injury due to a car accident. He was referred to the Emergency Department of Shohaday-e Ashayer Hospital with a generalized tonic-clonic seizure in January 2018. His blood glucose test result was 23 mg/dL on admission. After blood sampling, the patient was treated twice with 25 g (50 mL) intravenous aliquots of dextrose 50% at 15-min intervals followed by the administration of 100 mL/h of dextrose 10%. After the stabilization of his clinical status, the patient was transferred to the Intensive Care Unit (ICU) for accurate monitoring.

Before the car accident, he had no history of diseases or taking medications. He also had no history of smoking, drinking alcohol, or opium abuse. Following the accident, he underwent a craniotomy due to subdural hemorrhage and was then transferred to the ICU. Despite all the measures taken, the patient failed to regain his consciousness and remained in a persistent vegetative state. He was discharged on February 26, 2018, with the following medication regimen: phenytoin (100 mg twice a day), levetiracetam (500 mg twice a day), bromocriptine (2.5 mg three times a day), and enoxaparin (60 mg daily).

A family caregiver attended to him at home and he received the prescribed medications on time. He received the food and medications through a Percutaneous Endoscopic Gastrostomy (PEG) tube. A urinary catheter was also used to drain and collect urine, which was replaced every other week. The patient was transferred to the hospital after two days at home, as his family noticed short-term perspiration attacks and seizures.

Upon his entry to the hospital, he had spontaneous breathing, tachycardia (PR=115/min), a mild fever

(T=37.9°C) and tachypnea (PR=32/min). A coarse crackle was heard in the lower part of his right lung. A pressure sore (9×5 cm²) was noticed over the right side of his hip. His O₂ saturation level was 92% without oxygen. The following results were also reported after his tests: WBC=24800 cells/μL (PMN=89%), Hb=10.2 g/dL, platelet=435000 cells/μL, erythrocyte sedimentation rate=95 mm/h, Na=138 mg/dL, K=4.2 mg/dL, urea=12 mg/dL, Cr=0.5 mg/dL, Ca=10.4 mg/dL, P=3.2 mg/dL, AST=31 IU/L, ALT= 38 IU/L, Alkp=326 IU/L. His urinalysis showed an abundance of white blood cells and bacteria. In the ultrasound report, his kidneys had a normal size and the echogenicity of the renal parenchyma had increased.

In the ICU, the patient was treated with 100 mL/h of dextrose 10% plus intravenous antibiotic to treat aspiration pneumonia and sepsis induced by urinary tract infection. The previously prescribed medications, including phenytoin, levetiracetam, and bromocriptine, continued to be administered.

During the 96 hours of his ICU stay, the administration of antibiotics and hydration were used to terminate his fever, and the patient's leukocytosis gradually resolved. Despite his proper feeding through the PEG tube and receiving 100 mL/h of dextrose 10%, the patient's blood glucose dropped under 50 mg/dL and he required hypertonic glucose infusion (dextrose 50%) several times for the treatment of his hypoglycemia. In one hypoglycemic event, insulin serum level and C-peptide were measured with a blood glucose level of 46 mg/dL and the following results were obtained: BS=46 mg/dL, insulin=6.3 μIU/L, and C-peptide=1.93 ng/mL (0.64 nmol/L). The abdominopelvic CT scan showed normal size and density for his liver, spleen, and pancreas, without any serious lesions.

During his ICU stay, the patient was treated with dextrose 10%. He experienced hypoglycemic events following the drop in his rate of venous glucose infusion. The factors causing hypoglycemia were re-evaluated and the prescribed medications were reconsidered. The administration of bromocriptine as an antidiabetic agent was eliminated after consultation with a neurologist surgeon. Bromocriptine was discontinued and the patient's hypoglycemia came under control after 24 hours, and the dextrose serum infusion was gradually eliminated. No hypoglycemia was observed in the next days and the patient was discharged.

Discussion

In this case study, a patient with no history of diabetes faced hypoglycemia after the administration of bromocriptine. He experienced frequent hypoglycemic events while under treatment with bromocriptine, which was controlled by hypertonic glucose administration. Hypoglycemic attacks ended after the discontinuation of bromocriptine.

Several studies have reported the therapeutic effects of bromocriptine on neurosurgical rehabilitation in patients with acute cerebral injuries [1-3]. Treatment with bromocriptine results in desirable outcomes in patients with persistent vegetative state following traumatic brain injuries [3]. It seems that bromocriptine can control extrapyramidal symptoms, be effective in the treatment of muscular spasms, and lead to satisfactory outcomes in patients.

Bromocriptine was approved by the US Food and Drug Administration (FDA) in 2009 for the treatment of type-II diabetes [4]. The blood glucose-lowering mechanism of bromocriptine is possibly associated with the reduced production of hepatic glucose due to the inhibition of the sympathetic tone in the central neural system. This medication does not affect insulin secretion; however, it can increase insulin sensitivity in the muscles [4, 5]. Bromocriptine can reduce HbA1c levels to 0.5%-0.7% [6, 7]. It also can reduce triglyceride and serum-free fatty acid levels [7]. Bromocriptine can also enhance insulin sensitivity in non-diabetic individuals [8]. The patient studied in this research was not diabetic and had no history of diabetes in his family. The serum insulin and C-peptide levels of this patient were high when his blood glucose dropped under 50 mg/dL.

In the majority of the studies on diabetic patients, no hypoglycemia has been reported after the administration of bromocriptine [5, 7]. In a study conducted by Cincotta et al. the administration of bromocriptine in diabetic patients did not result in any significant case of hypoglycemia [9]. In another study by Gaziano JM et al. no significant differences were observed in hypoglycemia incidence among the patients treated with bromocriptine compared to those treated with placebo [6]. In a 52-month survey of bromocriptine administration in diabetic patients, no significant differences were observed in the rate of hypoglycemia in patients treated with bromocriptine in comparison with those who received a placebo [10].

In another research on the co-administration of bromocriptine and pioglitazone in diabetic patients, no severe hypoglycemia was observed; however, hypoglycemia was detected in the patients who used sulfonylurea along with these medications [11].

In nondiabetic individuals, bromocriptine can be used for the treatment of prolactin-secreting pituitary adenoma, acromegaly, and Parkinson disease [4, 10]. Hypoglycemia has never been reported in non-diabetic patients treated with bromocriptine [12, 13]. Even in patients with Parkinson disease who have received high doses of bromocriptine, no hypoglycemia has ever been reported [14, 15].

Given the presented evidence, hypoglycemia as a complication of bromocriptine was not diagnosed in the studied patient and its administration thus continued. Several days after beginning the treatment and not finding any resolutions for hypoglycemia, the patient's medications were reconsidered and the hypothesis of bromocriptine-induced hypoglycemia was raised, which resulted in the withdrawal of bromocriptine and the termination of hypoglycemia. The hypoglycemic attacks observed in this patient were thus attributed to the administration of bromocriptine.

Conclusion

In the studied non-diabetic patient, severe hypoglycemia occurred after the administration of bromocriptine, which was an unusual complication for non-diabetic patients treated with bromocriptine. Hypoglycemia as a severe complication of treatment with bromocriptine indicates that this medication should be cautiously prescribed to non-diabetic patients.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article.

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