

Case Report

Contraindications for the Use of Gabapentin Actavis and Nucleo C.M.P in Metformin-Controlled Diabetic Patients

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Abstract

Gabapentin can cause mild disorders of blood glucose due to an unknown mechanism of action. Because of the lack of data in the medical literature, it is difficult to define the true incidence or causality of gabapentin-induced hyperglycemia.

Key message: Gabapentin can cause mild disorders of blood glucose due to an unknown mechanism of action. In the absence of other factors, clinicians can accept gabapentin as a contributing factor to glucose fluctuations. Based on these principles, insulin therapy should be modified.

INTRODUCTION

To prevent and control seizures, gabapentin is used, along with other medications. It is also used in adults with spinal cord problems to alleviate nerve pain [1].

In rodents that are given gabapentin ≥ 400 mg / kg (orally or intragastrical), sedative effects have occurred. The dosage ranges from 600 to 1800 mg per day, divided every 8 hours into 3 doses. [1,2]

Nucleon C.M.P Forte has a wide spectrum of efficacy. It used to treat carpal tunnel syndrome, and in addition to its analgesia, it is also used in treating neuropathy induced in diabetic patients, it is also used in the treatment of spinal cord injuries [3-5].

Gabapentin and Nucleon C.M.P Forte are the usual treatments in clinics for pain caused by disk prolapse at any level of the spinal cord [5].

For the treatment of diabetes, Metformin is used. This medication is used to decrease both the production of hepatic glucose and to decrease the absorption of gastrointestinal glucose, as well as to increase the sensitivity of target cell insulin [6,7].

Some diabetic patients are controlled by Metformin (dose differs depending on the case), especially in the earlier stages of diabetes [7].

There is only one case report of Gabapentin-induced

hyperglycemia in a diabetic patient. Gabapentin can cause mild disorders of blood glucose due to an unknown mechanism of action. Because of the lack of data in medical literature, it is difficult to define the true incidence or causality of gabapentin-induced hyperglycemia [10].

CASE REPORT

A 65-year-old woman had severe lower back pain that radiated to her thighs and legs. She was a known case of type II diabetes, controlled once daily by Metformin (500 mg). After examination and investigations (X-ray and laboratory tests), she was diagnosed with chronic arthritis and disk prolapse of L1-L2.

Gabapentin (100 mg) was given once a day, and Nucleo C.M.P Forte (5 mg) was given once a day as well.

She has had a cardiovascular medical history of previous stable angina, and she was hypertensive too and it was controlled by propranolol (80 mg). She has no previous surgical history nor of any other history relevant to any system.

She returned to the clinic after two days and complained of high blood glucose explaining that her blood glucose level was checked by a glucometer because of the analgesics; and it was 147 mg / dl. She was told to stop the 4-day treatment and instead measure her blood glucose level before eating every morning (fasting glucose) and while recording the results (a glucometer and a trained nurse was measuring her glucose level every morning before eating).

After the fourth day, she was told to go back to the drugs and do the same with five days of blood glucose measurement (one day in the middle would be ignored to allow the drug to work). She came up with the results after ten days (which is clarified in Table 1) to find out that there is a quiet difference between the blood glucose level during and without treatment.

The mean glucose level without treatment was (104 mg / dl) and the mean glucose level with treatment was (118.25 mg/dl) and I found these results by using version 25 of the Social Science Statistical Package (SPSS) program.

DISCUSSION

There are not many case reports in medical literature to assess the effects of these two drugs on the glycemic level. There are only two cases reports, the first for a 63-year-old Caucasian gentleman; his type 2 diabetes mellitus established a potential case of moderate hyperglycemia caused by gabapentin, following several months of dose titration with gabapentin [10]. The other for a 58-year-old female with peritoneal dialysis end-stage renal disease with no history of diabetes mellitus; for two years (300 mg per day) she had been taking a steady dose of gabapentin. The dosage was raised to 300 mg twice daily for hypoglycemia, hypotension, dizziness, and exhaustion one month before hospital admission. With symptomatic and supportive treatment, the patient was successfully treated [11].

In order to evaluate the effectiveness and safety of gabapentin as a form of monotherapy for diabetes neuropathy, a randomized, double-blind, placebo-controlled, parallel-arm, multicenter study was performed [12]. The study tested 165 patients with uncontrolled type 1 or type 2 diabetes mellitus (levels of 11 percent or less of hemoglobin A1C). 75 percent of the patients were diagnosed with type 2 diabetes mellitus. There was a 7-day screening period and an 8-week double-blind period during the intent-to-treat trial. During the double-blind process, patients were randomized to have either gabapentin or the placebo. During the first 4-week duration of this process, gabapentin titration occurred; the dosage was increased weekly from 900 mg per day (week 1) to 3600 mg per day (week 3). During the second 4-week duration of the double-blind process, a fixed dose of gabapentin, as tolerated, was continued. The daily dose of gabapentin at 3600 mg per day was reached by around 68 percent of patients. No changes in hemoglobin A1C levels were observed; however, the authors most likely did not record baselines or treatment levels considering the limited period of the analysis. Thus, any potential improvement in glycemic regulation during this analysis is difficult to conclude [12].

	Without Treatment	With Treatment
1 st day	108 mg/dl	115 mg/dl
2 nd day	101 mg/dl	122 mg/dl
3 rd day	114 mg/dl	115 mg/dl
4 th day	93 mg/dl	121 mg/dl

After taking into consideration the findings in (Table 1) and compare between them, I found a big enough impact of medications on the type II diabetes in this patient. I learned that when the therapy is stopped, the level of glucose returns to normal, while it increases with treatment. Propranolol is administered with caution in diabetic patients because it is can possible to mask the signs and symptoms of hypoglycemia [8].

In the treatment of diabetic neuropathy, Nucleo C.M.P forte is widely used, so the risk of increasing glucose levels is very low [3]. Gabapentin can cause damage to the pancreas, and it is associated with pancreatic acinar cell tumors in rates. However, but there has been no post-marketing pancreatic carcinogenic signal with gabapentin [9].

The interactions between these three drugs may also play a role in increasing blood glucose level in such patients.

CONCLUSION

Gabapentin can cause mild disorders of blood glucose due to an unknown mechanism of action. Because of the lack of data in medical literature, it is difficult to define the true incidence or causality of gabapentin-induced hyperglycemia. Despite are many explanations as to why this potential adverse condition is not known. The probable number of incidents does not reflect the actual number of cases.

The casual relationship between gabapentin and glucose fluctuations has not been identified, and the mechanism of interaction is unknown. In the absence of other factors, clinicians can accept gabapentin as a contributing factor to glucose fluctuations. Based on these principles, insulin therapy should be modified.

DECLARATIONS

- Ethical approval was obtained from the ethical committee of the University of Baghdad – College of Medicine.
- Patient gave her consent to share the case for scientific purposes.
- **Data** will be available on reasonable request from the authors.
- All the authors contributed equally to this case report.

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