Decrease of Consciousness Level Caused by Baclofen; a Case Report

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Case report

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Abstract

Background: The side effects of drug use can have different consequences, from allergies to death. Among the drugs used to relieve chronic spasms is baclofen. Baclofen is a gamma-aminobutyric acid (GABA) agonist that is commonly administered orally and acts on the spinal cord. A few studies have been reported on mortality from baclofen.

Case presentation: This present study reported a case of decreased consciousness and drowsiness, and severe decrease in muscle tone as a result of taking only 50 mg of baclofen.

Conclusion: Level of consciousness can be decreased following the administration of baclofen but it is not permanent. Nurses are recommended to check albumin level of the blood as an intervening factor and pay attention to patients' responses to baclofen.

Background

The side-effects of drugs can have a wide range of effects from allergy to death. Totally, sometimes of drug side-effects cause permanent debilitation in patients so that a study reported that the risk of death in patients who experienced drug side-effects was about twice the patients who had no drug side-effects [1]. In addition, nurses are the largest group of professional health personnel as the frontline of health care systems. They undertake several and diverse roles and this diversity and complicity of roles makes nursing a professional activity that requires responsiveness, accuracy, and sharpness. Any shortage and imperfection in nursing education surely affect the quality and quantity of health services and public health consequently [2]. Among many, one of nursing tasks is to diagnose the side-effects of drugs. With the introduction of many new drugs with more benefits for patients, the risk of drug side-effects and the consequential costs and complications has also increased [3]. Among the drugs available for chronic spasms, baclofen is an agonist gamma- amino- butric acid (GABA) that is normally prescribed as an edible drug that affects the spinal cord. The drug also affects generalized and chronic spasms like MS. As an agonist GABA, it affects pre/post synaptic receptor (pre synaptic/post synaptic) and causes hypopolarization of the membrane. That is, as to pre-synaptic, the drug decreases the penetration of calcium and through this, decreases discharge of glutamic stimulation transmitter. In the case of post-synaptic, it facilitates the inhibiting effect of GABA [4]. The drug is recommended to treat alcohol dependency and spasms with spinal cord region. Recently, it has been used to treat hiccup with different etiologies in anxiety disorder cases. Its absorption happens in the digestive system, 70-80% of it is discharged by the kidneys, and the rest is metabolized by the liver and digestive system. The half-life of the drug is about 4hrs, which is longer in individuals with kidney failure. The drug is available at 10 and 25mg doses and the maintenance dose is normally 80mg/day [5]. It is a lipophile and can cross blood-brain barrier (BBB); therefore, high doses poisoning causes side effects like coma, seizure, apnea, and cardiac conduction disturbances [6]. While there are a few studies on the mortality rate caused by using baclofen, according to the North America Poison Information and Statistic Center, in six death cases, baclofen was the first cause and in 10 death cases, it was the co-cause factor. The majority of available reports are about

poisoning with 270mg< doses and poisoning cases with less than 270mg doses are rarely studied [7]. In Iran, we found a case of a 76 years old woman who had a decrease in consciousness level due to using 75mg of the drug in fall 2020 [8]. There was another case of decreased consciousness level in 28 years woman in Mashhad in spring 2020 that used 10mg dose of baclofen (100mg/day), who was recovered after 48hr hospitalization in the coronary care unit (CCU) [9]. In light of this, the present study reports a decreased consciousness level, sleepiness, and severe decrease in muscle power due to using 50mg baclofen. Therefore, the present study reported a case of decreased consciousness and drowsiness, and a severe decrease in muscle tone as a result of taking only 50 mg of baclofen.

Case Presentation

A 75 years old woman with weight about 50kg has a cardiac and respiration arrest and decreased consciousness level following internal bleeding caused by a car accident. Sonography results showed that one of the kidneys is functional. The patient has a history hypertension and an open-heart surgery. During nine months of hospitalization, tracheostomy and PEG was carried out and Central vein line was placed. During the past six months, the patient has been under home ICU care and received nursing care. Currently, the patient has acute limbs spasms and breathes intentionally without supplementary oxygen through a respiratory track. The saturation oxygen level of the patients is 97-100% and she receives Ritalin (5mg), Clexane injection (40mg), Plavix (75mg), atorvastatin (10mg), normal saline serum (1500cc/24h), sodium chloride (15%- 20cc), potassium chloride (5cc, 15% with the serum), sodium valproate 600mg/24h, captopril (75mg/24h), prazosin (1mg/24h), amlodipine (5mg, in the case of systolic blood pressure >160), and carvedilol 6.25 (in the case of heartbeat >80). Our examination of other vital signs indicated a few fever periods and sputum and urine cultures were positive several times and antibiotics were prescribed based on the culture results. The pupils and corneas react to light, while the patient is not able to follow the light or have a meaningful look. In response to painful stimulation, the patient tries to localize and remove the limb. Because of long-term rest in bed, the patient suffers severe spasm and muscle deformity at the upper and lower limbs. Physiotherapy was prescribed for the patients with bracing and skin traction. To solve the severe spasm of upper and lower limbs the attending physician prescribed baclofen 25mg/12hr and after taking two doses, the patient's level of consciousness decreased in 24hrs with sleepiness and acute loosen muscles of the upper and lower limbs. The patients did not respond to audio stimulations and the pupils had no reaction to light. There was no change in saturated oxygen level and without oxygen saturation was 96%. The patient did not have fever, systolic blood pressure was in 120-190 range and diastolic blood pressure was in 70-110 range. Cardiac rhythm was sinusoidal without arrhythmia and the test result were read (Creatinine: 1.2, Albumin: 2.9, Blood urea nitrogen: 34, Blood sugar: 160, Na: 139, Hemoglobin: 9.1). The liver enzyme level, thyroid function tests, **international normalized ratio**, partial thromboplastin time, and prothrombin time were normal.

Because the patient had not recently received any new drug other than baclofen, it was stopped. To check for disorder, a brain scan was prescribed and the results indicated no notable point. Sixty hours after stopping baclofen, sleepiness was resolved and the consciousness level increased. The patient was able

to open her eyes and react to sounds. The pupils and corneas also reacted to light, the loosen muscles were resolved, and limbs spasm recurred.

Conclusions And Discussion

To solve severe upper and lower limbs spasms, baclofen as an agonist GABA was used. The drug is recommended for chronic spasms with spinal cord sources. About 70-80% of the metabolic of the drug is in the kidney so that patients with kidney failure are at the risk of pharmaceutical poisoning [5]. Laren et al. reported baclofen poisoning in a 69 years old woman with kidney failure who used 40mg/day of the drug and with 4hrs dialysis, the symptoms of decreased level of consciousness were resolved [10]. Here, the patients only had one functioning kidney since her birth; still, her creatinine serum and urea levels were normal with acceptable urine discharge. Therefore, there was no proof of kidney function disorder. In addition, blood albumin of the patient was 2/9, which was below the normal level. Despite receiving three albumin vials (20%) per week, serum level of the drug was not adjusted. Since albumin is one of the most common protein in blood and transfers the majority of drugs in the plasma, albumin level has a notable effect on drug pharmacology and pharmacokinetic in plasma [11]. Therefore, it can have a role on the patient poisoning in this report. Nurses are recommended to check albumin level of the blood as an intervening factor and pay attention to patients' responses to baclofen.

Abbreviations

GABA: Gamma-aminobutyric acid; CCU: coronary care unit; BBB: blood-brain barrier

Declarations

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Authors' contributions

HE and MH examined and treated the patient. HE and MH wrote the manuscript and made all the figures. HE and MH advised on treatment protocol. NO supervised the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Our institution's Research Ethics Board does not require a review or approval for case reports.

Consent for publication

The patient consented to the publication of this case report and written informed consent was obtained from the patient.

Competing interests

The authors declare that they have no competing interests.

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