

Case Report

Case report on the administration of an eighty milligram diazepam injection without respiratory depression

Morteza Abdar Esfahani, Arash Beiki¹, Sedigheh Asgarian

Departments of Cardiology, ¹Internal Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Abstract

Nowadays one of the most challenging problems in Medicine is addiction — addiction to sedative drugs such as benzodiazepines. In this article, we are going to describe a case of diazepam addiction that has tolerated a high dose of intravenous diazepam.

Key Words: Addiction, diazepam, respiratory depression

Address for correspondence:

Dr. Sedigheh Asgarian, Department of Cardiology, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: a_seddigheh@yahoo.com

Received: 12-10-2014, **Accepted:** 18-05-2014

INTRODUCTION

Diazepam is a sedative agent that is categorized to the benzodiazepines group. It comes in three drug formations — Tablet, suppository,^[1] and ampule. This drug is a longacting benzodiazepine and has active hepatic metabolites. This drug affects the special receptors in the cell membrane, and induces inhibition of the Gaba-aminobutyric acid (GABA) in all parts of the central nervous system (CNS). GABA induces post and presynaptic inhibition in all part of the CNS.^[2] Diazepam is the choice treatment for alcohol withdrawal, anxiety, epileptic disorders, myoclonic seizures, panic attacks, headaches, and tremors.^[3] In short term it is used for anxiety and amnesia, and applied as an adjunctant drug in the acute phase of drug withdrawal, febrile seizure, muscle spasm. Probable side effects of diazepam,

such as: Ataxia (especially in old age), confusion, amnesia, agitation, headache, addiction, hypotension, sialorrhea, cramps, abdominal pain, visual distortion, decrease in libido, urinary retention, icterus,^[4,5] thrombophlebitis, rarely apnea, and hypotension have been reported.^[6] The cases of contraindication of the use of this drug are: Myasthenia gravis, acute respiratory distress syndrome, sleep apnea, severe hepatic failure, chronic psychotic disorder, and the use of this drug alone in depression or anxiety with depression.

CASE REPORT

This study is a case report that has done, in the year 2012, on a patient referred to St. Al Zahra Hospital in Isfahan, IR, Iran. By observing the special condition of this patient, the goal of the study was described to him and after the patient was satisfied and ready to take part in the study, his demographic information, past medical history, habitual history, duration of taking the drug, and probable side effects of diazepam were obtained. These data were registered subsequently. For evaluation of the patient's condition, specialist consultations in Neurology, Psychology, and other fields were obtained, and the data saved. For better confirmation of the information, examination, history

Access this article online	
Quick Response Code:	Website: www.advbiores.net
	DOI: 10.4103/2277-9175.146925

Copyright: © 2014 Esfahani. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

How to cite this article: Esfahani MA, Beiki A, Asgarian S. Case report on the administration of an eighty milligram diazepam injection without respiratory depression. *Adv Biomed Res* 2014;3:255.

taking, and laboratory data were repeated as needed and the results were compared in both instances. The patient was assured about the confidentiality of the information and his privacy and finally the results obtained were formed in reportable observation.

RESULTS

The patient was a 56-year-old man, who was admitted to St. Al Zahra Medical Center in Isfahan, IR. Iran. His chief complaint was chest pain. The chest pain started at rest, exacerbated with exertion, and radiated to the left shoulder and arm. The quality of pain was compressive. No history of sputum or cough was detected. In his past medical history it was noted that he was admitted twice for a similar problem, but refused to undergo angiography on both admissions. He had no history of diabetes, hypertension, or hyperlipidemia, but had a history of a mediastinal mass that more investigation in the past showed was an elevated right hemidiaphragm. From his drug history we understood the he himself had administered about 80 mg of intravenous Diazepam holus-bolus for relaxation and his anxiety and no problem had occurred with this injection. The other drug history included Captopril, Aspirin, and Methadone for his opium addiction.

His examination at admission was as follows: Blood Pressure: 120/80 mmHg, Pulse rate: 45 b/m. Oral temperature: 37°C. Normal head and neck examination, respiratory rate: 20/minute, clear lungs, normal heart auscultation, normal abdomen and limb examination, and normal hepatic enzymes. His electrocardiography (EKG) showed normal sinus bradycardia and corrected QT interval, and no ST-T change. He had good left ventricular function, and Grade 1 diastolic dysfunction. Ejection fraction was 60%. A suspicious mass compressed the right atrium. On the CXR (chest x-ray), mediastinal widening was seen.

In different consultations:

Urology Consult: In this consultation, because of gross hematuria, sonography of the kidneys and bladder and antibiotics were suggested. The hematuria resolved after treatment.

Psychology Consult: On account of amnesia, three diagnoses were suggested: Depression and suspiciousness, posttraumatic stress disorder, and malingering.

Fluoxetine and Olanzapine were prescribed and computed tomography (CT) of the brain was recommended; the imaginations were normal.

Neurology Consult: The examination was normal. There was no lateralized sign. Normal brain CT and continuing psychological treatment were recommended. In the current admission he refused to undergo angiography, but used a combination of oral methadone and intravenous diazepam.

Multislice CT coronary angiography: Showed non-significant coronary artery disease (CAD) and an elevated right hemidiaphragm compressing the right atrium.

A chest multidetector CT scan with contrast: The positive finding noted was, right hemidiaphragm elevation and focal calcification at the right thyroid lobe and atherosclerotic calcification of the descending aortic wall. Degenerative changes of the lower thoracic spine were seen.

In the past, in the Chamran Heart Institute of Isfahan, as per the cardiologist's report, the patient himself had admitted that he abused about 50 to 80 mg of intravenous diazepam forwardly and without physician administration, for amnesia, but he had had no significant side effects. He repeated same act again, twice, at the St. Al Zahra Medical Center, and yet no respiratory problem occurred. According to the patient's history, sometimes he was driving after a high-dose injection.

DISCUSSION

The aim of study is to describe the clinical, epidemiological, and physiological condition of a patient forwardly takes a high dose of diazepam, about 50 to 80 mg without any serious side effects. Studies have shown that benzodiazepines in all inpatients and outpatients, especially in a high dose, lead to a serious problem in the respiratory and cardiovascular systems and this side effect is because of their direct effect on the central nervous system. Hypotension, bradycardia, and apnea are signs of benzodiazepine poisoning.^[8,9] Cardiovascular depression is one side effect, when using this agent in anesthesia and also in Intensive Care Units.^[10,11] Despite the benefits of this agent in control of pain and anxiety, side effects like respiratory depression limit its administration. Benzodiazepines have a central effect and induce a dose-dependent decrease in the respiratory rate and tidal volume, but if they are administered carefully respiratory depression and hypoxemia occur rarely. A high dose of this agent, especially when the patient uses narcotics, can cause apnea. The reason for this event is because of the effect of the drug on the peripheral receptors on the lungs.^[11] When this agent causes a decrease in the

level of consciousness there is always respiratory depression and hypercapnia, especially when it is taken with other depressing agents like antiemetics, antiepileptics, and antihistamines.^[7] Also in a decreased level of *consciousness*, an increase in the level of drowsiness leads to respiratory depression. Thus, close monitoring before and after drug administration and re-examination every one to two hours, up to 24 hours, and then every two to four hours (depending on the patient profile) is the method followed to prevent respiratory depression. Usage of the standard dose and checking the consciousness, respiratory rate saturation of oxygen, and availability of naloxone (as antidote) prevents respiratory depression.^[3] Benzodiazepines like diazepam and midazolam, show their effects with respiratory failure, but the important point about these agents is their increased tolerance and decrease in their effect with frequent use. Unfortunately at this time, because of the high frequency of addiction in society and the poor control in supply and selling of these agents, we see additive abuse of these drugs by patients, especially in addicted patients. Otherwise addicted persons and even some patients with psychological disorder forwardly increase the dose of these drugs, and diazepam is on top of the list of this category, and because of the increased tolerance, high-dose abuse does not correlate with serious side effects. As we have seen, a high dose of narcotics and sedative drugs does not lead to intoxication or serious effects, so observation of tolerance in these patients is an alarm sign, for uncontrolled selling and consumption of narcotics and psychedelic drugs. Finally this matter must be considered by programmers and managers of drug supply and the organizations that block narcotics.

CONCLUSION

High-dose diazepam use or prescription can be a catastrophic event. Although this patient did not show adverse effect of the drug, it cannot be a good reason for prescription of a high dose of diazepam for other patients.

REFERENCES

1. Sisk AL. Reduction of venous complications of intravenous diazepam. *Anesth Prog* 1985;32:241-3.
2. Miller NS, Mahler JC. Addiction to and dependence on benzodiazepines. Diagnostic confusion in clinical practice and research studies. *J Subst Abuse Treat* 1991;8:61-7.
3. Juergens S. Alprazolam and diazepam: Addiction potential. *J Subst Abuse Treat* 1991;8:43-51.
4. Busto U, Kaplan HL, Zawertailo L, Sellers EM. Pharmacologic effects and abuse liability of bretazenil, diazepam, and alprazolam in humans. *Clin Pharmacol Ther* 1994;55:451-63.
5. Bergman U, Griffiths RR. Relative abuse of diazepam and oxazepam: Prescription forgeries and theft/loss reports in Sweden. *Drug Alcohol Depend* 1986;16:293-301.
6. Perdel V, Delga C, Rouby F, Micallef J, Lapeyre-Mestre M. Assessment of abuse potential of benzodiazepines from a prescription database using 'doctor shopping' as an indicator. *CNS Drugs* 2010;24:611-20.
7. Litchfield NB. Complications of intravenous diazepam - adverse psychological reactions. (An assessment of 16,000 cases). *Anesth Prog* 1980;27:175-83.
8. Stewart RC. Respiratory depression with diazepam: Potential complications and contraindications. *Anesth Prog* 1978;25:117-8.
9. Davies G. Complication of diazepam administration. *Can Anaesth Soc J* 1977;24:418-9.
10. Eloma MM, de C Williams AC, Kalso EA. Attention management as a treatment for chronic pain. *Eur J Pain* 2009;13:1062-7.
11. Soliman HM, Mélot C, Vincent JL. Sedative and analgesic practice in the intensive care unit: The results of a European survey. *Br J Anaesth* 2001;87:186-92.

Source of Support: Nil, **Conflict of Interest:** None declared.