J Anesth (2012) 26:289–291
DOI 10.1007/s00540-011-1275-4

CLINICAL REPORT

Propofol use for sedation or sedation for propofol use?

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Received: 25 August 2011 / Accepted: 20 October 2011 / Published online: 26 November 2011

Abstract A large amount of pharmacological and clinical evidence supports the abuse potential of propofol. Although previous case reports have indicated that recreational use of propofol is primarily by medical professionals, its spread among the general public has recently been highlighted. This is the first case report to show that cravings for propofol can be quite intense in some people, and thus propofol can be wrongfully used by clinicians who are enticed by the promise of monetary gain. Illicit diversion of propofol in hospitals has been confirmed; thus, propofol has been designated as a controlled substance in South Korea as of February 2011.

Keywords Abuse · Drug · Propofol · Sedation

Introduction

The use of propofol for sedation is widespread in a variety of diagnostic and therapeutic procedures throughout the world. After the first warning about propofol abuse in a human in 1992 [1], a growing body of literature has documented abuse in humans [2–5] and abuse-like behavior in animal models [6, 7]. Although the majority of cases of propofol abuse have involved healthcare providers, its recreational use among laypeople has also been documented [8–10]. However, this drug is not currently regulated as a controlled substance in any country except South Korea.

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This is the first case report to explain how the abuse potential of propofol can be unethically used for the pursuit of profits in cosmetic surgery clinics. From these illegal cases, our government became aware that repetitive propofol sedation, administered on a regular basis as a part of packages including various cosmetic treatments, could be highly profitable for some unethical clinicians. Considering this potential risk and given the reality of an increasing population of propofol addicts in the general public, propofol was eventually designated as a controlled substance in South Korea in February 2011.

Case description

Case 1

In December 2010, two general physicians were arrested for the repeated intravenous administration of propofol to their female clients, who were addicted to the drug. According to the Incheon City Police Department, they received US $85–350 from patients for propofol injections. Normally, one ampoule (200 mg/20 ml) of 1% propofol solution, which is not sold to laypeople, is supplied to hospitals at a cost of approximately US $9.

Initially, these physicians administered propofol intravenously for sedation during cosmetic procedures. Several weeks later, some of their patients requested propofol in the absence of cosmetic procedures. Thus, they administered propofol to patients who sought mild euphoria or a feeling of relaxation, followed by heavy sedation and loss of consciousness. Typically, one session of recreational use comprised several cycles of deep, relaxing sleep lasting approximately 5–10 min and an awakened state lasting a few minutes. During propofol sessions, each

sleep phase was induced by a bolus injection of 40–60 mg of propofol.

As this recreational use of propofol in these hospitals gained popularity in the local community, especially among young women in bars and clubs, the physicians administered propofol to every client who requested it. Most of these sessions were performed by unqualified personnel, including nurses' aides, without any limitations on administration intervals. Over several months, a total of 77 laypersons illicitly used propofol. Among these clients, this drug went by the alias of the "milky drug" or the "white one." In the most recent 6 months, these two clinics had allegedly taken in US $1 million for 3,000 instances of propofol injection.

Case 2

In September 2010, Seoul City prosecutors indicted five doctors at plastic surgery clinics on charges of authorizing the administration of propofol to patients by unqualified personnel including nurses' aides. These doctors had advertised the propofol injections as "vitamin shots," "fatigue-relieving drugs," or "diet drugs" under false pretenses and sold them as packages grouped with unnecessary treatments such as massages or skin therapy. They had each performed several cycles of propofol bolus injections at a time (one propofol session) for propofol-addicted clients for US $90–300. As a result, they allegedly had annual sales of US $45,000–50,000 from propofol injection alone, which had been administered as many as 400–1,400 times.

Most of these clients were young women who were working in adult entertainment establishments. They were seeking propofol because the drug was supposedly effectively for stress or insomnia. One of these clients had a history of more than 100 unnecessary diagnostic gastrofibroscopies, which were performed in other hospitals for the sole purpose of receiving propofol injections.

Discussion

Traditionally, the pharmacological features of propofol have made its abuse potential low, especially by the general public [5]. However, although evidence [2–5] indicates that the majority of propofol abusers are medical professionals, its potential for abuse among the general public has recently been highlighted after the tragic death of popular culture icon Michael Jackson.

Propofol abuse is known to be related to psychological, rather than physical, dependency [1, 2, 4]. Propofol addicts crave sexual fantasy, brief respite from pain, or pleasant, relaxing, and euphoric feelings during recovery from propofol anesthesia or sedation [5, 8–11]. The reason the vast majority of patients exposed to propofol apparently do not develop an addiction to the drug is that most patients cannot identify the agent that they received even when they find the effects pleasurable, and they are unable to gain access to the drug on the street [9, 12]. However, if patients are aware that propofol is used for sedation and know how to access this drug, its recreational abuse is no longer inaccessible to the general public. Even a layperson can easily differentiate propofol from other sedative drugs because of its typical white color. Additionally, propofol sedation is widely used for various cosmetic treatments (e.g., chemical or laser resurfacing and dermabrasion, or dermal filler injections), making it more available to the potential abuser. Furthermore, such treatments can be performed repeatedly in otherwise healthy patients on a regular basis. Thus, for financial gain, some unethical clinicians may use propofol injections to aggressively attract more customers to additional cosmetic treatments.

However, the major problem in the regulation of these abusive uses of propofol is that if propofol sedation is provided to addicts or potential abusers packaged with certain medical treatments, then legality is not a question of propofol sedation itself, but rather a question of over-treatment associated with the accompanying cosmetic treatments. All seven doctors in these cases were indicted on charges of authorizing the administration of propofol to patients by unqualified personnel. In South Korea, nurses' aides are forbidden to provide medical treatments such as intravenous administration of drugs.

Fortunately, no fatalities occurred in these two cases. However, many people whose addiction began in these hospitals may eventually look to cheaper black markets. They would then be exposed to more dangerous environments in which self-administration or injection by non-medical personnel may be performed without any medical support. According to the Korean FDA [11], 20 autopsy referrals for mysterious death that occurred outside of hospitals were found to be related to propofol abuse in 2000–2009.

The major reason for the spread of illicit diversion of propofol sedation in South Korea is presumed to be that the extremely competitive cosmetic market is linked to loose pharmacy control of propofol. According to the International Society of Aesthetic Plastic Surgery (ISAPS) Global Survey in 2009, South Korea was the country having the world's highest competitive cosmetic market. In terms of the number of board-certified plastic surgeons per population, South Korea headed the list of 25 countries surveyed, at 0.26 per 10,000 people. This rate was more than double the rate of 0.11 in Japan, the second highest country in Asia. Moreover, the low national medical insurance fee system has even prompted a growing number of 'nonplastic

surgery' specialists or general physicians to incorporate cosmetic procedures as part of their practice. In South Korea, most cosmetic procedures have been performed in the primary hospital setting. This situation may lead, in part, to the spread of 'sedation for propofol use' in some unethical physicians, as propofol is more freely used in local clinics than in larger hospitals in which many healthcare professionals work together. This possibility was supported by propofol sales reports that the proportion of propofol consumption in local clinics accounted for 46% of the total market consumption from 2008 to 2009 [11].

In contrast to the unequivocal position of the American Society of Anesthesiologists (ASA) supporting the placement of propofol into scheduled status under the U.S. Controlled Substances Act, the Korean Society of Anesthesiologists (KSA) failed to reach a consensus on this issue. Even the Korean Medical Association, a higher-level organization of KSA, implacably opposed the designation of propofol as a controlled substance on the grounds that propofol abuse was still much less frequent than abuse of opioids or benzodiazepines and that its stricter regulation would impede access to its clinical use. Nonetheless, the two cases presented here led to greater public awareness and media attention, thereby having a decisive influence on 2 years of intense debate about this issue. Designation as a controlled substance, of course, cannot be an answer to eradicate propofol abuse. However, the tighter control and monitoring that accompany scheduling of the drug is expected to reduce the potential for abuse.

The present cases definitely indicate that use of propofol sedation coupled with cosmetic procedures can be abused, and that the illicit use of propofol may be highly profitable for some unethical clinicians. It may also lead to participation by many laypeople in illicit diversion of propofol in hospitals, or, worse, outside hospitals. When considering the extremely high rate of mortality in propofol addicts [2, 5, 12], stricter pharmacy control of propofol should be considered, including controlled-substance regulation by the government or other national medical agencies.

Conflict of interest The author has no conflict of interest.

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