

Propofol Abuse in Professionals

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Media attention on the abuse of propofol, which is also called the “milk drug” or “white one” because of its typical white color, has increased significantly in Korea since the drug was implicated in the death of a lover of a gynecologist in August 2012. The misuse and abuse of propofol among healthcare providers has been reported worldwide, and some misuse has resulted in death (1-3). A recent survey utilizing a convenience sample of recovering anesthesia providers found rates as high as 3% for propofol misuse in the United States (4); however, the misuse of this drug appears to be much higher considering that misusers would probably not reply to such surveys. There is a similar situation in Korea. According to a report from the National Forensic Service of Korea, death related to propofol administration included 36 cases from 2000 to 2011 (5). Twenty of the 36 cases were related to propofol abuse, and > 70% of the victims were healthcare providers, including nurses, doctors, and hospital administrators. In another survey of 61 academic anesthesiology training hospitals in Korea, healthcare professionals in seven hospitals experienced colleagues who abused propofol (6). These results support the view that the incidence and prevalence of propofol abuse by healthcare providers are not low in Korea.

Although healthcare providers have access to a wide array of potent narcotics, injectable propofol has become a drug of choice, and the most common reason for this is ease of access. According to a report on the incidence of propofol theft cases from the Korea Food and Drug Administration (KFDA), the incidence of propofol theft included 396 cases in 2009, 548 cases in 2010, and 850 cases in 2011, which is a two-fold increase in the 3 yr (7). Considering the poor report rate to the KFDA, the number of propofol thefts is probably much higher. In particular, propofol is more freely used in local clinics, where access to the agent is relatively easy, than in larger hospitals where many healthcare professionals work together. This possibility is supported by a propofol sales report from the Health Insurance Review and Assessment Service indicating that the proportion of propofol consumption in local clinics accounted for 46% of the total market consumption from 2010 to 2012 (8). Such easy ac-

cessibility to propofol has been reported in the United States as well. The Wall Street Journal reported that most medical centers do not lock up propofol or closely monitor inventory as they do for addictive opioids (9).

Although the majority of propofol abusers are healthcare providers, its recreational use among lay people, most of whom are young women working in bars and clubs as entertainers, has recently been highlighted. Propofol sedation is widely used for various cosmetic treatments and for procedures in internal medicine such as gastric endoscopy. Most cosmetic procedures in Korea are performed in local clinics, which may lead to abuse in the lay public. For a patient to become addicted to an anesthetic agent, the individual must have both the ability to identify the agent, which most people are unable to do, and gain access to the agent, a difficult process for most people. Propofol is wrongfully injected into the lay public by clinicians who are enticed by the promise of monetary gain (10). Thus, healthcare providers are responsible for propofol abuse in the public.

Patients have reported a broad spectrum of feelings after taking propofol ranging from a general feeling of well being to elation, euphoria, and sexual disinhibition (3). The action of propofol at multiple receptor subtypes accounts for its potential for misuse/abuse and its overdose lethality. Propofol alters ventral striatal dopamine levels, a pharmacologic characteristic shared with other commonly abused medications (11). The action of propofol on dopamine likely accounts for its addictive properties (12). Additionally, propofol acts at gamma-amino butyric acid (GABA) receptors and N-methyl-d-aspartate (NMDA) type glutamatergic receptors (11). The action of propofol on GABA and glutamate, neurotransmitters critical for influencing level of arousal and consciousness, probably accounts for its anesthetic properties and potential for lethal overdose. Propofol rapidly redistributes from the plasma into highly perfused brain tissues, and its rapid redistribution into adipose tissue accounts for its short duration of action. That is why propofol has become a popular drug for anesthesia and sedation. However, factors affecting the drug's effects, such as drug redistribution, half-life, and clearance, can vary widely from person to person (13). Ap-

nea can persist for up to 3 min with a risk for irreversible and potential lethal hypoxemia (14). Therefore, the majority of deaths related to propofol abuse are thought to be due to respiratory depression. It is very important to be reminded that propofol has an extremely narrow therapeutic index, so the difference in dose for pleasure and apnea is very small.

Propofol was designated as a controlled substance in Korea in February, 2011, given its potential risk for abuse and the increasing population of propofol abusers. Nevertheless, propofol largely remains an uncontrolled substance because it can be relatively easy for healthcare workers to obtain due to its frequent use in the clinical setting and lack of government restriction.

Comprehensive countermeasures should be considered to prevent propofol abuse. First, healthcare providers, particularly those in local clinics, should pay attention to management of the drug ledger describing storage and release of propofol. Second, healthcare institutions should consider voluntary regulation for propofol access. Stricter pharmacy control of propofol, including monitoring with closed-circuit television and introducing a radiofrequency identification system should be considered. Hospitals can implement security systems for storing propofol. Third, preparing guidelines describing the indications and safe use of propofol is very important. Proper administration of propofol always necessitates continuous medical assistance and monitoring by an anesthetist with resuscitation equipment in a supportive clinical setting. Fourth, the open hospital system of the United States and the medical systems of Europe are valuable references in that medical institutions are classified as primary or secondary, i.e., patients are transferred to a secondary medical institution if they must be administered propofol. Last, it is important to prevent recurrence of propofol abuse by providing treatment services to chronic abusers, including hospitalization at a protection agency.

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