



## Original Research Article

### Anaesthetic Abuse and Suicidal Death: A Rare Case Report

Santhosh Chandrappa Siddappa\*, Viswanathan K G, Anupam Datta and Siddesh R C

Department of Forensic Medicine, J J M Medical College, Davangere, Karnataka, India

\*Corresponding author

#### A B S T R A C T

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Propofol is commonly abused drug combined with benzodiazepines. The property of propofol to cause euphoric, calming, anxiolytic and restful effect has resulted in its abuse by health care workers. The present study reported as a rare case of death of female OT nurse who was suffering from depression and was an abuser of intravenous drugs (Propofol and Midazolam) available to her at her work place. The narrow therapeutic window between sedation and significant respiratory depression likely accounts for the high incidence of death related to propofol abuse. But in this case she died due to hanging and not because of the Propofol or Midazolam overdose.

#### Introduction

Propofol (2,6-diisopropylphenol) is a short acting anaesthetic used for induction and maintaining general anaesthesia. It has no affinity to opiate, benzodiazepine or NMDA-receptors and thus should have no potential for abuse or addiction, which are always associated with the risk of overdosing like Fentanyl or Ketamine. (Poklis A (1995) Hendersson GL (1991) Sachs (1996) Peyton SH, Couch AT, Bost RO (1988) Licata M, Pieini G (1994) With its characteristics that allows for a quick

recovery time after induction compared to many other anaesthetics and minimal side effects, propofol has become the most widely used IV drug for induction of general anaesthesia Paul E. Wischmeyer et al, The most common drug of abuse that occurs together with propofol is benzodiazepines. Although abuse of benzodiazepines is common, combined use of benzodiazepines and propofol is still limited but increasing and benzodiazepines by themselves will not

cause respiratory depression, but the combination with propofol may enhance both the CNS and respiratory depressant effects Barr J, A. Donner 1995 The subjective effects of propofol have been described as euphoric, calming, anxiolytic, and restful. It is now known that propofol possesses dependency potential and as such should be labeled a controlled substance by regulatory agencies Welliver et al., 2012.

We report the death of a female OT nurse found dead in hanging state at her residence with several empty propofol, midazolam ampoules littering on the floor. Her relatives reported that she was suffering from depression and habitual intravenous anaesthetic abuser.

### **Case report**

The deceased was a 32-year-old female OT nurse, with history of divorce 8 years back and she used to stay alone at her residence. Body was brought to mortuary for postmortem examination on 27/03/2013 at morning 8 am. There was a continuous ligature mark present over the neck above the thyroid cartilage, signs of decomposition were present over the body and multiple needle puncture marks were present over the dorsum of left hand and left cubital fossa, which compelled us to visit the scene of offence to see any evidence of foul play present or not with the help of police. At the scene of offence, we found several empty as well as unused ampoules of propofol, midazolam, empty syringes and needles lying on the floor. She was suffering from depression and was an abuser of intravenous drugs available to her at her work place as per the information given by her relatives and co-workers.

### **Post-mortem Examination**

The body was of a female aged about 32 years moderately built and nourished. Face was swollen and abdomen was distended. Signs of decomposition like marbling, postmortem blisters were present on the abdomen and upper aspect of the both thighs. Tongue was protruded and bleeding was present from the both nostrils. Salivary staining was present over the clothing.

There was a continuous ligature mark present over the neck above the thyroid cartilage, 37 cm in length and 4 cm in breadth, 8 cm below the chin, 2 cm below left ear lobe and 4 cm below the right ear lobe. The knot was in the occipital region which shows the point of suspension.

Three needle puncture marks were present over dorsum of left hand and two needle puncture marks over the left cubital fossa. On dissection of the puncture mark areas haemorrhages were found.

All the organs were intact, soft, flabby and pale. Lungs were intact, soft, flabby and greasy. On neck dissection, no evidence of strap muscle contusions, and carotids were intact. Larynx and trachea were intact, no fracture of hyoid bone and thyroid cartilage.

### **Samples forwarded to FSL**

During autopsy- 1. Routine viscera along with 10 ml of blood. 2. Skin flap from needle puncture mark site in the dorsum and cubital fossa of left hand (with controls of opposite hand). From the scene of offence- 1. Empty as well as unused ampoules. 2. Syringes.

FSL report showed presence of Propofol (Anaesthetic) and Midazolam (Hypnotic) in the blood and needle puncture mark area (via HPTLC).

### **Cause of Death**

Death is as a result of obstruction of airways and interference of cerebral circulation due to hanging.

### **Discussion:**

#### **Demographics and access**

Healthcare professionals (HCPs) are disproportionately represented among propofol and other IV anaesthetic abusers. Related to this disproportion is the access of propofol by drug diversion. Nurses, OT assistants, physicians, and other healthcare workers are exposed to propofol in their work settings because of its widespread use throughout the facility and its current lack of consistent accountability.

#### **Regimens of abuse**

Regimens of propofol abuse include intravenous bolus injections of 50-200 mg followed by sedation, unconsciousness, and then awakening. This regimen is repeated many times at one binge or throughout the day. The need for privacy and available time for propofol's effects are to be considered. Privacy likely accounts for abuse occurring in call rooms, bathrooms, automobiles or peoples who are living alone.

Propofol's pronounced and short duration of effects in conjunction with its narrow therapeutic window makes its abuse an alarming concern. All cases of propofol abuse disclosed decreased individual task performance.

### **Underlying psychological unrest and comorbid conditions**

Psychological distress was frequently associated with propofol abuse. Disclosed desires or motivators for propofol abuse included desire for escape, rest, sleep, and relief of stress and anxiety Welliver et al., 2012.

Health care professionals, with high incidents of depression and trauma, presents a diagnostic tetrad (propofol abuse, female gender, depression and past trauma). Prudent evaluators should carefully inquire about other potential elements of the tetrad (e.g.-early life trauma) when a HCP presents with the other 3 (e.g. - female HCP with propofol use and depression Earley P H, Finver, 2013.

### **Subjective effects**

Described feelings and subjective effects associated with propofol abuse include relief of anxiety, stress alleviation, calm feelings, and restful sleep. Anxiety and insomnia may be symptoms of depression. Many have hypothesized that drug abuse is an attempt to self-treat an underlying psychological disorder. An argument can be made that propofol abuse is an attempt to self-treat anxiety, stress, and/or insomnia. Pharmacologic treatment of psychological disorders is not advised, possibly illegal, and in the case of propofol, highly dangerous Welliver et al., 2012.

### **In present case**

Presence of empty vials of propofol, midazolam, needles, empty syringes in the scene of offence and presence of needle prick marks in the dorsum of left hand and



left cubital fossa indicates she was taking those medications. Findings in the scene of offence as well as ligature mark were consistent with suicidal hanging. Data collected from the investigating officer, relatives and friends of the deceased, scene of offence visit, post mortem findings indicated that she was suffering from depression and was a habitual propofol and midazolam abuser.

### **Outcome**

Propofol overdose leading to respiratory arrest and cardiac arrest are the suspected causative events responsible for death. The narrow therapeutic window between sedation and significant respiratory depression likely accounts for the high incidence of death related to propofol abuse Welliver et al., 2012. But in the present case, propofol abuse and suicide by other means makes it a rare and unusual outcome.

## Recommendations

1. Health Care Professionals (HCPs), particularly those in local clinics, should pay attention to management of the drug ledger describing storage and release of propofol and other IV anaesthetics.
2. Health care institutions should consider voluntary regulation IV anesthetic access.
3. Review of written records of all drugs ordered, dispensed, administered, damaged and returned unused, and specific use for which they are intended, by comparing drug register and patient records.
4. Organisation of random audits by a suitable person e.g. a pharmacist, to look for discrepancies or errors, and to ensure that drug use is consistent with patient need.
5. The requirement for concrete evidence of breakage or damage, plus adequate explanation, before replacement drug is used.
6. Strict pharmacy control of propofol, including monitoring with closed circuit television, introducing radiofrequency identification system should be considered.
7. Preparing guidelines describing the indications and safe use of propofol is very important.

## Conclusion

Health Care Professionals especially those working in anaesthetic setup (ICU, OT etc.) have easy and unrestricted access of intravenous anaesthetic drugs. It occurs more commonly in women (when compared with the other gender of all HCPs). Propofol abusers commonly have a history of depression and earlier life trauma; this is clinically important when establishing initial and continuing care plans, circumstances of anaesthetic abuse

and death. If propofol is part of the use pattern of a substance-dependent HCP, treatment providers should screen and aggressively treat a diagnosed depressive illness and sequelae of earlier life trauma to control propofol-related self-harm injuries and suicidal tendencies.

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