CASE REPORT

Abuse of Telazol: An Animal Tranquilizer

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ABSTRACT

Background: Telazol® (tiletamine hydrochloride 50 mg/mL, zolazepam hydrochloride 50 mg/mL) is utilized in veterinary medicine as a small-animal anesthetic. Telazol is comparable to ketamine in efficacy, and in conjunction with ketamine, has been responsible for one reported human fatality. We report a case of a woman who abused telazol. Case Report: A 30-year-old female employee at a local zoo was found unresponsive in a clean animal treatment room. Initial reports were that she had injected veterinary-grade diazepam and telazol. On-scene paramedics reported her as obtunded and arousable to deep painful stimuli, with gag reflex intact. Systolic blood pressure was 90 mm Hg by palpation. A fresh needle puncture mark was present on her right arm; nearby were a syringe, tourniquet, and bottles of each drug. Emergency Department assessment included airway, breathing, circulation, and intravenous access. She was lavaged and given activated charcoal with a cathartic. Shortly after arrival, she became alert and oriented. Family members insisted this was not an overdose. The patient had been previously evaluated for reported episodes of syncope, “only in the evening, while at work,” and was prescribed diazepam for anxiety. Product information on telazol was limited to the Veterinary Drug Physician’s Desk Reference. A urine drugs-of-abuse screen was positive for benzodiazepines and cannabinoids. The patient subsequently revealed a history of recreational use of telazol. She was discharged to an in-patient detoxifi-
cation facility, 12 hours postadmission. **Conclusion:** Telazol used in veterinary medicine as an anesthetic agent, is structurally related to ketamine. Telazol causes almost immediate anesthetic effects; and sudden alertness is not uncommon as the effects of the drug subside. Urine drugs-of-abuse screens are unlikely to identify telazol. We report a veterinary worker who abused telazol.

**INTRODUCTION**

Telazol is a combination in equal parts by weight of the base tiletamine hydrochloride, an arylinocycloalkanone dissociative anesthetic, and zolazepam hydrochloride, a nonphenothiazine diazepinone having minor tranquilizing properties (1–5) (Fig. 1). Telazol is mainly used to sedate small animals because of its rapid action as an anesthetic agent. Telazol has been reported to be comparable to ketamine in efficacy but is associated with less cardiovascular depression (1–3). There is little clinical information concerning human exposure to telazol and one report of a human fatality involving both telazol and ketamine (6). The manufacturer of telazol received reports of two human exposures to telazol in 1998–99, but was unwilling to disclose the specific details of each case (7). We report a case of a woman who admitted using telazol for recreational purposes and survived.

**Case Report**

A 30-year-old female employee at a local zoo was found unresponsive by fellow workers in a clean animal treatment room. Initial reports by paramedics were that she might have injected veterinary-grade diazepam and telazol. On scene, paramedics reported the patient as obtunded, responsive only to deep painful stimuli. She had a blood pressure of 90 mmHg/palpable. Her gag reflex was intact. Next to her were a syringe, tourniquet, and a bottle of each of the above drugs. A fresh needle puncture mark was present on her right arm. Paramedics established intravenous (IV) access and transported her to the emergency department (ED). In the ED, she was lavaged and given activated charcoal with a cathartic. A urine sample was sent to the laboratory for a drugs-of-abuse screen (DAU).

The patient was admitted to the intensive care unit (ICU) for further evaluation. The patient’s family reported that her past medical history was unremarkable; however, she had been recently evaluated for syncopal episodes. The family stated these syncopal episodes occurred “only in the evening, while at work”; she was subsequently prescribed diazepam for anxiety by her primary physician. The family insisted she had no previous history of drug overdose or substance abuse and believed this incident to be another unexplained syncopal episode. The only available information on telazol was located in the *Veterinary Drug Physician’s Desk Reference* (2). The patient remained stable with a good gag reflex and never required intubation. Her DAU screen using a fluorescence polarization immunoassay was positive for benzodiazepines and cannabinoids. On awakening shortly after admission, she did admit recreational use of telazol and its use prior to the present admission and the syncopal episodes. Based on the 2 mL missing from the partially used telazol vial, she potentially injected up to 200 mg of telazol, or 100 mg of each ingredient. At 12 hours postadmission, she was discharged to an inpatient detoxification facility.

**Figure 1.** Chemical structure of Telazol.
Laboratory Methods

The patient’s bottle of telazol, obtained when she was admitted, was later tested for cross-reactivity on a DAU. Undiluted drug was assayed on an Abbott Axsym® System (Abbott Laboratories, Abbott Park, IL) using fluorescence polarization immunoassay (FPIA). Qualitative positive results were obtained for the following assays: Barbiturate II U assay (threshold 200 ng/mL), Benzodiazepine assay (threshold 200 ng/mL), and Phencyclidine (PCP) II assay (threshold 25 ng/mL) (8), while negative results were obtained for the assays amphetamine/methamphetamine, cocaine metabolites, and opioids.

Contamination of the patient’s bottle of telazol and/or improper storage conditions were considered as alternative explanations for the positive assay results. A fresh bottle of telazol was obtained from a local veterinarian. This bottle was kept under cold conditions, as recommended by the manufacturer, and the assay was repeated on the Abbott System. The results were identical to those found with the patient’s bottle. This fresh sample was then assayed undiluted on the Syva 30® Biochemical System using the EMIT II System, [Dade Behring (Syva), San Jose, CA] for urine drugs-of-abuse. Results were strongly positive for benzodiazepines, with weak cross-reactivity for opiates, amphetamines, and PCP, and negative for barbiturates, cannabinoids, and cocaine metabolites.

Telazol (5 mg/mL) was also diluted with drug-free urine to concentrations of 10 µg/mL and 100 µg/mL. Both diluted samples were assayed by the FPIA and EMIT II methods described above. Results were negative for all analytes tested at both concentrations.

DISCUSSION

Telazol is a combination of equal parts by weight of the base tiletamine hydrochloride and zolazepam hydrochloride (1–5). It is supplied as 500 mg active drug and 288.5 mg mannitol. The addition of 5 mL diluent produces a solution containing the equivalent of 50 mg tiletamine, 50 mg zolazepam, and 57.7 mg mannitol per mL. The solution has a pH of 2.0–3.5 after reconstitution and is recommended for deep intramuscular injection in animals (1–4). Telazol is used primarily to sedate small animals because of its rapid anesthetic action. Its efficacy is reportedly comparable to ketamine, but is associated with less cardiovascular depression. Although telazol causes almost immediate anesthesia in animals, sudden alertness is not uncommon as the effects of the drug subside. During the first 15 minutes after telazol is administered, the respiratory rate in animals is doubled, tidal volume is decreased to less than one half of control values, and PO₂ levels decrease. Hypoxemia and cyanosis usually occur, but pulmonary function returns to normal after approximately 35 minutes. Telazol does not abolish laryngeal or pharyngeal reflexes and intubation is seldom required. The eyes commonly remain open, exhibiting dilated pupils (1–4).

Adverse effects of telazol in animals have been described. These include excessive salivation, vomiting, muscle rigidity, hypertonicity, Central Nervous System (CNS) stimulation, seizures, pulmonary edema, apnea, hypothermia, and a prolonged recovery time. Tachycardia occurs frequently lasting approximately 30 minutes, after which the pulse returns to the baseline rate. Hypertension and hypotension are not uncommon. Respiratory depression and death may occur following high doses (1,2,4). Telazol is excreted by the kidneys, and is contraindicated in animals with pancreatic or renal disease (1,2,4).

Human exposure to telazol is largely unknown since there is only one reported fatality (6). Although the manufacturer received reports of two human exposures to telazol in 1998–99, the specific details of these cases are unavailable to the public. In the case reported by Cording (6), telazol was coinjected with ketamine. Whole-blood drug concentrations determined at autopsy were tiletamine 295 ng/mL, zolazepam 1.71 ng/mL, and ketamine 37 ng/mL, while postmortem concentrations in urine were 682 ng/mL, 1.33 ng/mL, and 381 ng/mL, respectively (6).

The fatal toxic level of telazol alone is unknown. We estimate that our patient may have injected as much as 200 mg of telazol. This dose is similar to that given to chimpanzees, who may receive as much as 3.6 mg/kg for anesthesia.

Although our patient admitted to using both diazepam and telazol, no serum concentrations were obtained, making it difficult to attribute the specific findings in this patient to telazol alone. Our patient was obtunded and hypotensive but had an intact gag reflex. Obtundation and hypotension are consistent with the adverse effects of telazol as described in animals, but they could also be effects of diazepam.

Although the patient’s urine did not test positive for PCP, undiluted drug did cross-react with both of the tested PCP immunoassays. The discrepancy may relate to urinary dilution of the drug or an interfering substance. Drug concentrations of 10 µg/mL and 100 µg/mL in urine did not cross-react with either the FPIA or EMIT.
II assays. These concentrations are sufficiently above the cutoff level (25 ng/mL) to produce a positive result on the PCP assay for the urine drugs-of-abuse screen. Although tiletamine is structurally related to both PCP and ketamine (Fig. 1) (5,9), it is unlikely that in a clinical setting of drug overdose, cross-reactivity would occur during DAU immunoassay testing. However, since there are multiple immunoassays available for DAU testing, large overdoses might produce a positive result on another assay system that was not tested here. The positive test for benzodiazepines is consistent with the use of diazepam. Our findings suggest that telazol would not produce a false positive cannabinoid result; the positive test for cannabinoids is thought to reflect antecedent use of marijuana.

Treatment for human exposures to telazol has not yet been established if the gag reflex is intact and intubation is not required. This patient received lavage and activated charcoal in the event of a coingestant. Given the limited information, the poison control center recommended the standard airway protection, decontamination, supportive care, and baseline toxic screens. Flumazenil was not recommended due to the patient’s chronic use of diazepam and the risk of a decreased seizure threshold. Theoretically, flumazenil should reverse the zolazepam effects but no human studies have been performed. Yohimbe hydrochloride, used off-label for human overdoses of clonidine, has been reported to reverse the sedative effects of telazol in animals (12–14). Yohimbe, a central selective alpha-2 antagonist, readily penetrates the CNS producing central adrenergic stimulatory effects, at low doses. This might also modify the effects of telazol and ketamine but more studies are required. This case appears to be the first report of human exposure to telazol for recreational purposes with survival. Telazol, like ketamine, can be abused, especially by those with easy access to veterinary medications.

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REFERENCES

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