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Immobilization of Giant Chacoan Peccaries (*Catagonus wagneri*) with a Tiletamine Hydrochloride/Zolazepam Hydrochloride Combination

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ABSTRACT: A tiletamine/zolazepam combination was used to immobilize 24 captive giant Chacoan peccaries (*Catagonus wagneri*) at a mean dosage rate of 2.18 mg/kg (SD = 0.46) of body weight, given intramuscularly. The mean induction time (the time from injection until recumbency) was 7.6 min (SD = 2.1). Standing time (the time from injection until the peccary stood without stimulation or assistance) ranged from 90 to 240 min. Tiletamine/zolazepam in combination was an effective and safe immobilizing agent for giant Chacoan peccaries.

Key words: Giant Chacoan peccary, *Catagonus wagneri*, tiletamine, zolazepam, immobilization.

The endangered giant Chacoan peccary (*Catagonus wagneri*) inhabits the harsh Gran Chaco thorn forest of northwest Paraguay, southeastern Bolivia and northern Argentina. To learn more about the biology and husbandry of giant Chacoan peccaries, the Zoological Society of San Diego has established a captive breeding program at Estancia Toledo, Gran Chaco, Paraguay. Safe chemical immobilization of this species is necessary to conduct physical examinations and diagnostic procedures.

Telazol® (A. H. Robins Co., Richmond, Virginia, USA) is a commercially available, nonnarcotic, nonbarbiturate, injectable anesthetic agent, approved for use in dogs and cats. This anesthetic is available as a 1:1 (w/w) ratio of teletamine hydrochloride to zolazepam hydrochloride. Tiletamine is a dissociative anesthetic and zolazepam is a benzodiazepine tranquilizer. This combination has been used to immobilize a wide variety of domestic and nondomestic animals (Gray et al., 1974; King et al., 1977; Boever et al., 1977; Schobert, 1987).

There are no published reports on the use of immobilizing agents for the Chacoan peccary. The closely related collared peccary (*Tayassu tajacu*) has been successfully immobilized with ketamine hydrochloride (Lochmiller et al., 1984). One report on the use of tiletamine/zolazepam combination on collared peccaries is limited by small sample size (n = 5), wide recommended dosage range, and no description or comments on its effectiveness (Gray et al., 1974).

In a short clinical trial, five collared peccaries were successfully immobilized using a tiletamine/zolazepam combination of 2.2 mg/kg of body weight, given intramuscularly (i.m.) (J. L. Allen, unpubl. data). This information was used in the present study as a foundation for immobilization of giant Chacoan peccaries.

This study was conducted from September 1990 to July 1991, at Estancia Toledo, Gran Chaco, Paraguay (22°21′S, 60°2′W). Twenty-four (14 male, 10 female) 1- to 7-yr-old giant Chacoan peccaries weighing between 15 and 40 kg were used. They were maintained in large outdoor fenced enclosures and fed a mixture of mandioca, squash, sweet potatoes, cactus pads (*Opuntia sp.*), small hard rolls of bread, seasonal fruit (e.g., watermelon), and nuts (e.g., peanuts).

The immobilizing agent was reconstituted with sterile water to a concentration of 50 mg/ml each of tiletamine and zolazepam. It was given i.m. by hand injection, pole syringe or by using a plastic projectile dart (Vario dart, Telinject USA, Inc., Saugus, California, USA). After injection, the animals were left undisturbed until becoming recumbent and immobilized. A

TABLE 1. Body weights, drug dosages, induction times, rectal temperatures, pulse, respiratory rates, and oxygen saturation for 24 giant Chacoan peccaries immobilized with a combination of tiletamine and zolazepam, September 1990 to July 1991, Paraguay.

	Mean	SD	Range
Body weight (kg)	30.0	7.18	15.9–40.0
Drug dosage (mg/kg)	2.18	0.46	1.4–3.1
Induction time[a] (min)	7.6	2.1	5.0–10.0
Standing time[b] (min)	ND[c]	ND	90–240
Rectal temperature (C)	38.6	1.4	37.2–40.5
Pulse (beats/min)	104.7	24.3	71–184
Respiration (breaths/min)	53.8	12.2	34–64
Oxygen saturation (%)	93.2	2.2	90–98

[a] Induction time = the time from injection until recumbency.
[b] Standing time = the time from injection until the animal stood without assistance.
[c] Not determined.

peccary was considered immobilized when it was unable to stand after being approached and gently touched or pushed. During the initial 30 min of immobilization, rectal temperature, respiratory rate, heart rate and oxygen saturation were monitored and recorded every 5 min. Monitoring was done by rectal thermometer, counting chest excursions, and use of a pulse oximeter (N-10 Pulse Oximeter, Nellcor Incorporated, Hayward, California, USA). The tongue was used as the site of sensor placement for all pulse oximetry measurements. Oxygen saturation is a measure of the degree to which oxygen is bound to hemoglobin. The pulse oximeter was used to estimate oxygen saturation by sensing differences in the absorption spectra of these two forms of hemoglobin (Kelleher, 1989). Induction time was defined as the time in minutes from injection of the drug until the animal became recumbent. Standing time was defined as the time in minutes from injection of the drug until the peccary stood without assistance.

The results are reported in Table 1. The ambient temperatures during this clinical study ranged from 16 C to 29 C. Inductions and recoveries were smooth. Convulsions or excessive salivation were not observed. There was no morbidity or mortality and no peccaries became re-sedated. After being immobilized, animals were wrapped with dark, soft towels around their eyes to calm them. All animals retained palpebral, corneal and swallowing reflexes. Overall muscle relaxation was good which enabled thorough physical examinations. Respiratory patterns often were observed to be rapid, shallow and fast.

Cutaneous analgesia was poor in that all peccaries reacted with limb movement to routine venipuncture. It was not possible to make continuous observations during the recovery period; thus, the standing time is reported as a range from 90 to 240 min. Standing animals retained an ataxic gait and dulled mentation. Full recovery with normal behavior occurred 6 to 8 hr post-immobilization.

One yearling male not included in the study accidently was given a double dose of 4.4 mg/kg i.m. of tiletamine/zolazepam. Doubling the dose did not achieve a shorter induction time (7 min) but it did lengthen standing time (300 min) and the time until fully recovered (12 to 24 hr). This is consistent with Kreeger et al.'s (1990) observations in gray wolves (*Canis lupus*). The rectal temperature, heart rate, respiratory rate and oxygen saturation in this double-dosed animal were similar to other animals in the study. From this one experience, doubling the dose of Telazol did not result in a deeper level of anesthesia.

One female giant Chacoan peccary was pregnant at the time of her immobiliza-

tion. No problems were noted during her examination and pregnancy was confirmed by abdominal palpation. Two weeks following immobilization she gave birth to two healthy babies. Although no complications occurred in this case, immobilization of pregnant animals generally is not recommended.

Pulse oximetry has been used in veterinary medicine as a noninvasive, continuous method of assessing oxygenation in a variety of species (Mihm et al., 1988; Barker et al., 1989; DeNobile et al., 1990; Whitehair et al., 1990; Lee et al., 1991; Schmotzer et al., 1991). The oxygen saturation data reported for the immobilized giant Chacoan peccaries in this study is consistent with a healthy physiological state.

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