

## BEIRA (*DORCATRAGUS MEGALOTIS*) IMMOBILISATION IN AL WABRA WILDLIFE PRESERVATION

MARTIN-JURADO O<sup>1</sup>, HAMMER C<sup>2</sup>, HAMMER S<sup>2</sup>

<sup>1</sup>Division of Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich, SWITZERLAND

<sup>2</sup>Al Wabra Wildlife Preservation, vet.awwp@alwabra.com, Doha, STATE OF QATAR

Beira Antilopes (*Dorcatragus megalotis*) are classified as vulnerable by the IUCN. Their special physiology and housing requirements convert their handling and restraint in an art (FOWLER and MILLER, 2003). Currently, Al Wabra Wildlife Preservation (AWWP) is the only zoological facility where this species is held in captivity. There are no reports on chemical restraint for the species; therefore, protocols used for other antelopes based on a combination of a cyclohexamine and an alpha-2 agonist (PORTAS et al., 2003) were used. The objective of this retrospective study is to evaluate the safety and quality of ketamine-medetomidine combination and antagonization with atipamezol for Beira immobilization.

42 healthy Beiras (38 females, 2 males) weighing  $10.2 \pm 1.8$  kg were immobilised under  $21.5 \pm 4.4$  °C temperature and  $67 \pm 13$  % air humidity in Qatar. Claw trimming ( $n = 11$ ), animal transfer ( $n = 7$ ) and routine health checks ( $n = 17$ ) were the main purposes of the immobilisations. Animals were darted by blowpipe, delivering a mixture of ketamine hydrochloride (Ketamindor<sup>®</sup>, Richter Pharma AG, Wels, Austria) ( $1.8 \pm 0.6$  mg/kg body weight) and medetomidine (Domitor<sup>®</sup>, Pfizer GmbH, Karlsruhe, Germany) ( $0.060 \pm 0.008$  mg/kg body weight) (dosages expressed in relation to the exact body weight of the animals determined during the immobilisation; the intended dose was 3 mg/kg ketamine and 0.08 mg/kg medetomidine). For reversion, alpha-2 antagonist atipamezol (Antisedan<sup>®</sup>, Pfizer GmbH, Karlsruhe, Germany) ( $0.34 \pm 0.04$  mg/kg body weight; intended dose 0.4 mg/kg) was injected intramuscularly at the same volume as medetomidine. Corneal and anal reflexes, as well as muscle relaxation, were continuously monitored during anaesthesia in 17 animals. Quality and time of induction, recumbency and recovery were recorded.

At the time of blowdart injection, 73 % of the animals were active and only 27 % were considered calm. Body condition was described as good or fair in 85 % of the cases and 15 %, respectively. Induction with ketamine and medetomidine dart lasted  $13.0 \pm 5.5$  minutes in animals without dart complications ( $n = 24$ ) and  $19.0 \pm 9.5$  minutes in those cases in which dart failure was reported ( $n = 16$ ) with either not the complete dose delivered, or not reliably delivered intramuscularly but subcutaneously. The difference in induction time between the groups was significant (t-test,  $p = 0.03$ ). This allowed  $38 \pm 15$  minutes and  $29 \pm 14$  minutes of surgical tolerance, respectively (difference not significant). 95 % of the animals underwent smooth induction ( $n = 38$ ) and 5 % showed hyperpnea or shivering ( $n = 2$ ). The injectable anaesthesia maintained animals within  $38.1 \pm 0.8$  °C mean rectal temperature,  $60 \pm 6$  heartbeats per minute and  $31 \pm 19$  breaths per minute during recumbency. Muscle relaxation was optimal and reflexes remained extinguished during manipulation in all 17 animals in which they were monitored. After intramuscular antagonization, recovery phase lasted  $11 \pm 10$  minutes in animals without complications with blowdart and  $14 \pm 15$  minutes in animals with dart complications (difference not significant). 90 % of the animals woke up smoothly ( $n = 36$ ), 7 % showed hyperpnea ( $n = 3$ ) and just one exemplar underwent regurgitation with no further complications.

Diverse immobilization protocols have been used in small antelopes for a wide variety of procedures (GROOTENHUIS et al., 1976; JESSUP et al., 1985; HOWARD et al., 2004). Combination of opioids with cyclohexamines and/or alpha-2 agonists, are widely described in successful chemical restraint

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protocols (JANOVSKY et al., 2000; CITINO et al., 2002; PORTAS et al., 2003). The use of ketamine-medetomidine were derived from previous studies of antelope anaesthesia and the dose used are ranged among the ones described for wild ruminants (KREEGER et al., 2002; FOWLER and MILLER, 2003; PORTAS et al., 2003). The comparatively long induction times in the Beira Antelope might suggest that either the inclusion of an opioid (JESSUP et al., 1985; JANOVSKY et al., 2000; CITINO et al., 2002; PORTAS et al., 2003; HOWARD et al., 2004), or an increased dosage (FOWLER AND MILLER, 2003), would lead to faster induction in this species. For example, an induction time of  $6.4 \pm 2.6$  minutes was achieved in Addax Antelopes (*Addax nasomaculatus*) with etorphine ( $0.033 \pm 0.008$  mg/kg body weight) and detomidine ( $0.022 \pm 0.005$  mg/kg body weight) (PORTAS et al., 2003) and in Hartebeest (*Sigmoceros lichtensteini*) induction took  $5.1 \pm 1.5$  minutes after thiafentanyl ( $0.021 \pm 0.004$  mg/kg body weight), medetomidine ( $0.008 \pm 0.001$  mg/kg body weight) and ketamine ( $1.1 \pm 0.2$  mg/kg body weight) injection (CITINO et al., 2002). Evidently, the dosage and protocol used for the Beira represents a careful approach. However, tolerance time was enough to carry out the restraint aim and it was longer than immobilizations reported in Arabian Oryx (*Oryx leucoryx*) (ANCRENAZ, 1994) or Hartebeest (CITINO et al., 2002). In contrast, a longer tolerance time for this protocol and dosage has been described in Addax Antelopes (PORTAS et al., 2003). This fact on the whole with good muscle relaxation quality and reflex absence before reversal in Beiras, may allow higher immobilization times if necessary. The recuperation time was uneventful and long, compared with the recovery phase of other studies (e.g.  $3.4 \pm 1.6$  minutes in Addax) (PORTAS et al., 2003). Typical recovery signs observed in the Beiras Antelopes included a raised hair coat and followed by urination shortly after the animals were standing again. 40 % of the anaesthetised animals ( $n = 16$ ) suffered consequences derived from drug delivery problems (improper placing of the dart, use of a too short dart needle), resulting in an incomplete dose distribution or undesirable administration route; an unintended overdose of the antagonist was most likely a consecutive problem. Thus, incomplete drug delivery in anaesthesia protocols will not only lead to a prolonged induction time, but also to a more prolonged recovery time, resulting from antagonist overdosing. However, the low proportion of problems, in the comparatively long induction and recovery phase as well as in the tolerance stage, supports the conclusion that this dose can be considered as adequate. In comparison, higher complications were reported in two studies; resedation in Arabian Oryx at 2 to 5 hours after antagonisation (ANCRENAZ, 1994) and mortality in Big Horn Sheep (*Ovis canadensis nelsoni*) and Tule Elks (*Cervus elaphus nannodes*) 2 days after restraint (JESSUP et al., 1985). Furthermore, anaesthesia quality was similar in calm and active animals at the time of restraint or between animals with good or fair body condition. In conclusion, we present the combination of ketamine and medetomidine as a safe and adequate immobilization protocol for minor procedures in Beira Antelopes.

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