

CHEMICAL IMMOBILISATION OF NORTHERN WHITE RHINO *Ceratotherium simum cottoni*

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The 31 northern white rhinos *Ceratotherium simum cottoni* at Garamba National Park in north-eastern Zaire represent the last known wild population of this subspecies. As part of a project to protect these valuable animals and to learn more about their movements and interactions, a number of these rhinos were immobilised to attach radio collars. The rhinos were also measured, their ears notched, external parasites were collected and blood and genetic samples were obtained.

Problems that had to be overcome:

- * Rapid induction was vital because of the abundance of water and to prevent excessive exertion (high ambient temperatures and humidity).
- * Because we were darting on foot and could not get to the darted rhino quickly, life-threatening respiratory depression in the rhinos had to be prevented at all costs.
- * Good muscle relaxation was vital to open the jaws of the rhino and make tooth impressions.
- * The rhino had to be kept recumbent for a long period to carry out all the necessary procedures.
- * We wanted an alert rhino after giving the antidote.

To achieve the above, we darted the rhino using a mixture of etorphine, detomidine and hyaluronidase. For sub-adults and adults we used 2,8 - 3,8 mg etorphine, 10 - 16 mg detomidine and 1500 IU hyaluronidase. This mixture gave a quick induction with good muscle relaxation but without serious respiratory depression. Respiratory rates varied from 4 to 18 breaths / minute. The water-soluble benzodiazepine, midazolam, was given intravenously to improve muscle relaxation, which in turn improved the quality of respiration and facilitated making dental impressions. Body temperatures varied between 37,6 and 40,0°C and were correlated with the degree of exertion during induction and the quality of muscle relaxation. Heart rates were between 60 and 120 beats / minute, and averaged about 70 beats / minute. Immobilisation was antagonised using the long-acting pure opioid antagonist naltrexone (60 - 150 mg), the shorter-acting pure opioid antagonist naloxone (200 - 300 mg) or a combination of naloxone and diprenorphine (150 - 200 mg naloxone and 7,5 - 12 mg diprenorphine). The detomidine was antagonised using 2 - 3 mg of the α_2 antagonist RX821002A. Antagonism was good, although there was some residual sedation from either the detomidine or the midazolam.

LONG-DURATION IMMOBILIZATION OF ARABIAN ORYX *Oryx leucoryx*, USING A MEDETOMIDINE-ETORPHINE COMBINATION

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Six Arabian oryx *Oryx leucoryx* were immobilized for long-duration anaesthesia using a combination of etorphine ($0,046 \pm 0,008$ mg.kg⁻¹ of body weight, i.m.) and medetomidine ($0,005 \pm 0,0002$ mg.kg⁻¹ of body weight, i.m.). The animals were kept under immobilization for the purpose of translocation during a mean period of $259,1 \pm 76,9$ minutes. Rectal temperature was monitored, and clinical parameters as well as respiratory and heart rates were taken every 20 minutes. Furthermore, blood samples for haematology (Red Blood Cells Count and Hematocrit) were taken every 30 minutes on two animals.

Temperature dropped slightly at the beginning of the anaesthesia and then remained unchanged. Respiratory rate increased from a mean value of 17 bpm at $t=30$ mn up to a mean value of 40 bpm at $t=90$ mn, then decreased to 21 bpm at $t=180$ mn. Except for one animal, heart rate remained constant. All these physiological parameters ranged between acceptable values. Haematological analysis showed a significant decrease of Ht and RBC from respectively $41,0 \pm 2,67\%$ and $7,86 \pm 0,93 \cdot 10^6 \cdot \text{m} \ell^{-1}$ at $t=30$ mn to respectively $34,3 \pm 2,7\%$ and $4,7 \pm 0,93 \cdot 10^6 \cdot \text{m} \ell^{-1}$ at $t=140$ mn. Variation in physiological parameters (heart rate, respiration rate and body temperature) and clinical parameters monitored are discussed.

Two of the animals died. One showed a false deglutition at the beginning of the protocol. Death seemed to be directly related to inadequate fasting. The second showed signs of acute septicaemia eight days after translocation. To avoid such problems a 48-hour fasting is absolutely necessary. Causes of death did not seem to be directly related to the long immobilization protocol. The possible applications of the performed long-lasting anaesthesia in translocation of Arabian oryx are discussed.

THE USE OF LONG-ACTING TRANQUILLIZERS IN THE MANAGEMENT OF TRANSLOCATED ENDANGERED SPECIES

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Translocation includes mechanical or chemical capture, confinement in restricted accommodation, transportation, relocation and adaptation to an unfamiliar environment. These activities are unnatural, dramatic, traumatic and stressful to most wild animals. Under confinement in unnatural conditions animals become aggressive and territorial, display dominant and hostile tendencies and often wound each other fatally. Animals grouped together in unfamiliar captive surroundings have conflicts with fellow animals and do not adapt to the enforced confinement. While confined under "pen or boma stress", the affected animals refuse to eat, attempt to escape and die from exhaustion, stab wounds, infections or starvation. Long-acting tranquillizers have strong sedative attributes and prolonged sedation and are invaluable for controlling psychomotor excitement, stress, injuries and aggression in recently-captured animals; for adapting wild animals to new environments; calming animals during lengthy transportation by road, sea or air; minimizing mortalities during relocation to unfamiliar destinations; habituating recently-captured wild animals to confinement in quarantine stations and at game auctions. Long-acting tranquillizers are administered in a single dose to give a therapeutically effective tissue concentration lasting for several days. The most beneficial effects are a modification of the animal's disposition towards the surroundings and other animals and the animals start eating and drinking sooner than animals that were not tranquillized. The use of long-acting tranquillizers must not be regarded as a substitute for inferior capture, holding and transportation techniques and endangered animals must always be captured competently and professionally with minimal stress by experienced personnel. Species that have been successfully tranquillized for various translocation procedures are the following : Lichtenstein's hartebeest; roan antelope; sable antelope; Cape buffalo; tsessebe; black and white rhino. Dosages for these species are discussed.
