Ketamine-xylazine anaesthesia in Snow Leopard (*Uncia uncia*)

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Chemical immobilization in wild mammals has been in practice since prehistoric times. Opium preparations appear to be the drugs of choice during hunting of wild animals in those times. Today, the most commonly used narcotics are etorphine (M-99) and carfentanil. The dissociative and other tranquilizers are ketamine, xylazine, medetomidine etc. These drugs appear to have wide safety margins and are found suitable for most mammalian species.

A male adult (4 years) Snow Leopard named Prabhat weighing about 30kg showed symptoms of occasional limping of right hind limb. For the purpose of physical examination, the animal was tranquilized with a combination of ketamine* & xylazine** on 20.x.06. The doses of drugs used were as follows: ketamine - 5mg/kg body wt. & xylazine - 1mg/kg body wt. The combined drug (1.5ml : 0.3ml - ketamine: xylazine) was taken into a plastic projectile syringe (3ml capacity) and administered in the thigh region with pressure gun.

The injection was given at 1100hr and induction of anaesthesia took about 10min. Respiration was normal, salivation was minimal and eyes remained open. There was excellent level of analgesia and anaesthesia. The animal was shifted from its enclosure to enclosure having squeeze cage for daily treatment, dressing and observation. The hind leg had moisture sores between the foot pads that led to irritation on walking and occasional limping. The examination and necessary clinical procedures were completed within 25min. Complete recovery occurred 45min (1155hr) after injection of xylazine and ketamine.

Wallach & Boever (1983) reported ketamine and xylazine combination as the most commonly used chemical agent in wild carnivores. The drug potency of the combined drug is useful for achieving the requisite complete immobilization instantaneously. The sedative analgesic and muscle relaxation properties of xylazine have also been found to be useful in combination with ketamine for Snow Leopards without any side effects.

* - Ketamil injection: 100mg/ml ketamine (as hydrochloride)
** - Ilium xylazil - 100 injection: 100mg/ml xylazine (as hydrochloride)

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Mass vasectomy in Black Bucks (*Antilope cervicapra*)

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Sri Chamarajendra Zoological Gardens, Mysore, has a good breeding record of all the deers and antelopes, including Black Bucks. This results in overcrowding and related problems in the limited space. Population management measures like rehabilitation, shifting or zoo exchange programme, use of oral contraceptives, separation of the sexes etc., have been tried. However, these measures have their own limitations. Hence, surgical sterilization of these animals was considered as an alternative.

As countable number of animals in the Zoo, of either sex were considered for sterilization. Sterilization of female is an invasive, time consuming and highly technical procedure that requires proper post-operative care. On the other hand, sterilization of males is less cumbersome, less time consuming and hardly requires any post-operative care. As many male-specific characters sustained by the male hormones like testosterone produced in the testicles need to be retained, vasectomy is preferred to castration in wild animals.

Procedure

Totally, 24 male black bucks were vasectomised in two phases.

Phase one - two adult animals, aged about 2yr and weighting around 30kg were selected for operation to standardize the tranquilizing and surgical techniques and to study the limitations and related problems peri-operatively.

Each animal was darted with a total dose of 150mg of ketamine hydrochloride (HCl) and 30mg of xylazine HCl. The animals were in complete lateral recumbency with good muscle relaxation within 10min after darting; were shifted to the zoo hospital and intravenous fluids were administered throughout the surgical procedure.

Surgical site was prepared aseptically and the spermatic cords were exteriorized from the separate incisions on the caudo-dorsal aspect of the scrotum. A small nick was made on the tunica vaginalis exactly over the vas deferens and later was separated from the mesorchium. A centimeter of vas deferens was excised and the cut ends were ligated with '0' catgut. The skin incisions were closed with '0' vicryl. A single dose of long acting oxytetracycline was injected intramuscularly and the animals were shifted back to the main enclosure.

One of the animal showed head righting reflex in 40min and complete recovery within 45min. Another animal, which required an additional dose of 50mg ketamine HCl, showed head righting reflex in one-and-a-half hour and required 3hr for complete recovery. Both the animals were alert and active by the next day and further observation for a period of 4 months did not reveal any surgical related problems.

Phase two - 22 Black Bucks (2 sub-adults and 20 adults) were vasectomised following the same procedure as in phase one along with special arrangements made in the animal enclosure. Corners of the enclosure were covered with tree branches to act as camouflage for easy darting, a makeshift operation theater was arranged to reduce the duration of anesthesia required for to-and-fro shifting of the animals from main enclosure to the hospital and a barricaded small isolation area was constructed to keep the operated animals under close observation for 7-10 days and left ear of all the animals was notched for future identification. The operation was conducted in batches of 3-5 animals over a period of three months.

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Results and discussion: Vasectomy in captive animals is reported in Giraffe (Vogelnest & Ralph, 1997), Chimpanzee (Hoffman *et al*., 2002) and in Lion (Vasanth *et al*., 2002) and is found to be a better alternative to other measures in controlling of breeding in captivity.

Black Bucks are very timid animals and unplanned attempt to tranquilize may results in severe causalities. Darting from behind a camouflage will help to a greater extent in tranquiling these animals without exciting them. A smooth induction of anaesthesia and recovery was noticed using ketamine HCl and xylazine HCl combination that varied form 150-325mg and 5-30mg depending on the estimated body weight.

Post-operatively, one of the animal showed unilateral swelling of the scrotum on second day that might have been due to accumulation of blood from a small capillary bleeding. Treatment with oral anti-inflammatory drugs for a period of five days brought back the condition to normal. Otherwise, all the animals recovered uneventfully.

Subsequent observation over a period of eight months did not reveal any related complications and all the animals showed normal mating behaviour.

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Infighting leading to injury in bull elephant

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An injured bull Asian Elephant (Image 1[w]), 9ft, was detected in Manikchua reserve, Angul Forest Division, Orissa. It was an adult bull, approximately 30 years old. The Elephant was moving slowly and a foul smell was noted.

It was decided to examine and treat the elephant under sedation on 30.iii.2006. The injured animal was in a forest patch that was very bushy and thorny and not ideal for darting. The animal was driven to open land by loud noise. The first darting, near Makarkanda nalah was not successful. As the animal then moved further a second dart was fired at 12.23hr. The dart consisted of 350mg of xylazine (3.5ml), 0.3mg atropine sulphate (0.5ml) and 100mg ketamine (1ml) in a 5ml syringe dart. After 11min the animal was still standing with drooping trunk and relaxed penis, but movement of ears and forelimb persisted. At 12.40hr another injection of 200mg xylazine and 100mg of ketamine was injected intramuscularly in the left hind limb, 5min after which the elephant was in deep sedation emitting deep snores.

On examination, three wounds were detected on the left side; one in the gluteal region, one in the abdominal region and the third on the forelimb. On the right side 11 punctured wounds were observed in the temporal and cervical regions, at the base of the ear and throughout the pinna. All the wounds were examined for presence of any metallic foreign body using a metal detector. No metallic object was noted. Then the wounds were dressed with hydrogen peroxide and turpentine oil. The wound cavities were irrigated with 5% povidone-iodine lotion and painted with Himax™ ointment.

As the elephant was in standing sedation the wounds of temporal and head region were dressed using a long stick wrapped with gauze and medicines. Other medicines administered were penidure-LA-24 lac i/u, esgipyrine-40ml, dexona-30ml and avil-10ml intramuscularly at different sites. All these procedures continued up to 1340hr and 5ml of yohimbine hydrochloride was injected intramuscularly for reversal. After 10min the elephant started moving and entered the thick forest cover.

The wounds might have been caused due to infighting between males for acquiring a mate. The tail of the elephant was without brush. The wounds were suspected to be one week old. It was deemed necessary to keep constant check on the movement of the elephant. However, by the next day the animal was found dead by forest officials about 5km away from the treatment site.

Post-mortem examination revealed large amount of blood clots with perforation of abdominal organs. The wounds were deeper and abscessed. Detailed and thorough check-up of the organs did not reveal any metallic objects. The histopathological examination of heart, liver, lungs, kidneys, intestine and stomach did not show any significant changes. The elephant may have succumbed to internal haemorrhage with septicemia.

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[w] See Image 1[w] in the web supplement at www.zoosprint.org

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Oesophageal obstruction in an Indian Mud Turtle *Lissemys punctata*

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plus web supplement of 2 pages

Ingestion of fishing hooks can cause severe oesophageal, stomach and intestinal lesions in turtles. Depending on their position in the digestive tract, foreign bodies and fishing hooks can either be removed by hand, with an endoscope or by means of a surgical operation (Bentivegna, 2004). The present paper describes removal of a fishing hook from the oesophagus of an Indian Mud Turtle *Lissemys punctata*.

An Indian Mud Turtle which had swallowed a fishing hook attached to a braided synthetic thread commonly used for fishing was presented to the surgery clinic of Orissa Veterinary College (Images 1 & 2[w]). History revealed that the turtle was caught in the fishing equipment from a pond on the outskirts of Bhubaneswar city. The general body condition of the turtle was good; weight of 2.2kg. Then it was radiographed in a dorso-ventral view using 57kV &10m as at 100cm FFD. The radiograph revealed a barbed fishing hook attached to a thread embedded in the oesophageal muscle (Image 6[w]). Ketamine hydrochloride 80mg was injected intramuscularly into gluteal muscle by drawing its hind limb. Within 5min the turtle was anaesthetized with its limbs and head prolapsed out of carapace. Examination of oral cavity did not reveal presence of

[w] See Images 1-8[w] in the web supplement at www.zoosprint.org

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