



Tranquilization and translocation of elephants

Jacob V Cheeran, K. Chandrasekharan and K. Radhakrishnan

The word tranquillisation, though mean only peace-of-mind it is extensively used for drug immobilisation of wild animals. Elephants pose a unique problem both as a wild animal as well as a domesticated animal in elephant range countries. Hence a thorough knowledge is required about the animal, drug, and behaviour after dosing and care of the immobilised animal.

This is intended as a practical guide to the field veterinarians and biologists. The topic is divided into domesticated elephants as well as wild elephants.

Domesticated elephants

Most important indication of drug immobilisation of a domesticated elephant is loss of control of the mahout over the animal. The animal will bolt away and refused to obey the mahout, owner or any other person who can command the animal in normal condition.

Often the animal will be in musth and hence aggressive in behaviour. Some times the animal would have killed the mahouts. There were several occasions in which the animal will not allow the mahout who is riding on the elephant to climb down. Darting an animal with a man riding on is risky and has to be done with caution. If the animal is attempting the shake down the mahout or tries to catch him jumping

down is not advisable.

In such instances lead the animal to a compound wall of two meters height and let the rider jump over the wall. Simultaneously the elephant's attention can be diverted. Climbing on to a tree holding a branch is all right if the elephant is not keen on getting the individual.

The elephant can step back and hold the man with its trunk. Elephant can stand on the hind limb, place the forelimb on the tree and stretch the trunk. If the man has to spend more time on the elephant he can be given bottled water to quench the thirst as well as fruits like banana throwing from a distance. Considerable time spend on the animal can exhaust the individual. The legs may be come benumbed by sitting astride for a long period.

Drug immobilisation is the only sure or safe and quick method in these conditions.

Drugs

A combination of xylazine 100 mg. along with acepromazine 40-60 mg. per metric tone is quite effective. If the animal is to be exposed to hot sun, this may resulting photosensitization and burning of the skin on the back of the animal. A triangular portion beginning from the dorsal aspect of the neck gets burned.

Combination of xylazine with ketamine is also effective. But here also there is a risk of photosensitization. The synergy of ketamine-xylazine combination seen in other animals like carnivores is not noticed in elephants.

A very popular drug Immobilon LA (etorphine with acepromazine) is effective. But the animal lies down quickly and hence translocation is not possible. If the animal need not be translocated this is very effective. This is extensively used in wild elephants and details are given where wild elephants are discussed.

XYLAZINE (ROMPUN)

This is an alpha-2-adrenoceptor against first time to be used extensively in veterinary practice. It has also some alpha-1 adrenergic effect that may be responsible for some of its peripheral vascular effect. It is metabolised in the liver and excreted through urine. It may also block the AV conduction at times. Sedation analgesia, amxiolysis, bradycardia, mild depression of respiration, diuresis, and inhibition of secretion and motor functions of the GA tract is

*Dr. Jacob V Cheeran,
Dr. K. Chandrasekharan &
Dr. K. Radhakrishnan
Retd. Professors, Thrissur.*





noticed. Disturbance during induction can prolong the onset of sedation. Vomiting seen in carnivores is not noticed in elephants. Another interesting feature with xylazine is that the animal obeys the command as if in a hypnotic trance if right dose is given.

Dose recommended is 100 - 120 mg/MT of body weight. Extreme aggressiveness, musth, painful conditions, and ambient disturbances may necessitate higher doses.

Preparation

2% solution (20 mg/ML)

10% solution (100 mg/ML)

500 mg. dry powder in vials with diluent.

Azaperone

Azaperone has been used for sedation and tranquillisation of a number of species including elephants. It gives good results with Opioids. In Asian captive elephants total dose for adult elephants is 80-100 mg. In large animal even up to 140 mg are used. It is better used in situation with elephants in a quite area. There could be occasional excited reaction when they are stimulated during the induction phase. Induction from IM injection is usually 20-30 minutes. Animal will continue to respond to commands but very slowly. They also will continue to consume food (slowly). The nature and type of sedation is similar to Xylazine. The duration of sedation is about 45 minutes to 1 hour.

It has got very wide margin of safety and normal dosages appear to have no significant adverse effect on CVS or on thermo-regulation. There is no specific antagonist.

Preparation:

Formulation 40 mg /ml

Solution 50ml vials.

Reversal

Yohimbine is recommended @ 0.125 mg/KG, atipamezol (Antisedan) @ 1mg/every 8-12 mg of xylazine will result in quick reversal. Respiratory stimulant like doxapram (Dopram) @ 100 mg/T can also be used. Administration of 4 amino pyridine along with Yohimbine is used. There are some commercial preparations containing Yohimbine with 4 AP. (Antagozil SA). If given separately each solution should be taken in separate syringes because of chemical incompatibility.

Tolazoline and phentolamine can also be used. Ephedrine is good in reversing the action. But the stupor may remain.

Darting

There are different types of syringe projectors and dart syringes available for drug immobilisation. A

captive elephant is often to be darted only when it is aggressive and does not obey the mahout. Hence, any approach by a person to dart will be aggressively responded. Unlike the wild elephant the captive elephant has lost the fear of the man. Hence he has to be very careful about his safety as well as people around. Very often it could be in a festival ground where it is very difficult to control the crowd which is eager to see the operation. Hence crowd management will be a big problem and assistance from local law and order enforcing authorities like police is to be sought. The darter can take up a vantage point and the animal can be teased to come to or pass through the place. The animal can also be stalked. Being intelligent animal stalking is easily noted, hence attention, diversion is a must to get close to the animal. But however make sure that no body stands on the opposite side of the elephant in the line of dart course to avoid accident.

Extra long range syringe projector which works on explosive charges, usually 0.22 is convenient because we do not know at what distance we will be able to dart the animal. Being a large animal (adult) even if a higher charge than what is necessarily required can be borne by the elephant. The dart syringe mechanism can be that of explosive capsules to get quick injection. In Africa, Kruger syringe is recommended to get the injection deep intra-muscular. But I have no personal experience. The animal may try to knock off the dart with its tail, rub off on a leaning branch or take out with the trunk if shoulder is a site.

Since the drug is given IM it may take anything from 6-8 minutes as the latent period before the drug starts taking the effect. The animal is to be translocated on foot and hence, only bare minimum is given first. So it takes 40-45 minutes to get the peak effect. Horizontal targetry is a must to penetrate the thick skin and also for the explosion of syringe charge.

The dart kit should always be dry and any left over liquid/water in the syringes inside the kit can dampen the charge, resulting in the failure of explosion. Hence every time when the charges are put, whether it is 0.22 blank or syringe charges it may be rubbed between the hands to warm it and to ensure that the charge will explode. Keep the powder dry an old maxim. The charges can be kept in a dessicator or dried keeping in direct sun light or in a hot air oven.

The darting kit should carry hypodermic syringes and needles, scalpels, artery forceps, cotton, surgical spirits, antibiotics, and intra-mammary infusions.

Actual procedures

Darting more than 420 elephants (June 2001) during the last two decades developed this technique of tranquillisation and translocation. Practically almost





all of them had been in musth and aggressive. Initially nicotine was used which was discontinued. On one occasion Xylazine with Ketamine and once Gallamine was used.

Xylazine was used @100 mg/MT of body weight with Acepromazine 40 -60 mg/MT body weight. Tranquillisation was done either in the festivals, villages, towns and timber yards or occasionally in forests where lumbering operations were done. No kunkies (monitor elephants) were used. Darting was done invariably on foot, except on rare occasions from the tope of a building or from a tree. The animal after sedation has to be translocated for short distances to a safe tethering site till it is amenable to safe handling by the mahout. At times mahout would have been killed also. On certain other occasions animal will have to be darted with the mahout still being on the top of the elephant. Elephant do not allow the mahout to climb down from the elephant. Ketamine, Xylazine did not produce much synergism as is seen in carnivores. Ketamine also produced photo sensitisation. When the animal is to stand in the hot sun a triangular portion beginning from the neck to the thoracic portion on the back got the 'burn'.

A large number of animals were controlled using Acepromazine plus Xylazine combination. The sedation and manipulation was good. But some of the elephants that were exposed to the direct sunlight developed photo sensitisation on the dorsal aspect. The area, which got the sunburn, was triangular in shape with the dimension of 45 x 90 x 90 cms approximately with the base beginning from the neck. To prevent the sunburn, as well as to arouse the animal from sedation, water was poured over the animal. However, to avoid the occurrence of photo sensitisation the Acepromazine, which is a Phenothiazine derivative was avoided and only Xylazine was used @ 100-120 mg/MT. The equipment used was either, Palmer's Cap-chur gun, or Dist inject using detonating mechanism (syringe charge) for the drug injection. Any disturbance during the injection prolonged the induction period to a considerable time. Since most the darting was in crowded areas it was very difficult to contain the jubilant crowd and their enthusiasm. The initial symptoms of induction were noticed by the relaxation of the penis. This symptom will be noted, within 5-8 minutes after the dart syringe injects the drug. This setting up of symptoms will be there only if there is no disturbance. If there are disturbance, from the crowd, fireworks of the festivals etc the onset will be delayed. Gradually the movements of the tail become less and less, the ear flapping and trunk movement is reduced. The animal almost remains motionless.

Snoring may be noticed at times. But this snoring should not be considered as an indication for the depth of anaesthesia. The animal can be aroused explosively if handled. The peak action of the drug is attained by around 40-45 minutes after the darting. The body temperature usually remains within the limits unlike that of the Etorphine. The animal while feeding stops feeding with fodder kept in the mouth. It is neither dropped nor consumed. Animal will be in a standing position and if by any chance it attempts to lie down, which is rare should be discouraged. If it lies down it may go to deep sleep and will be difficult to translocate. Animal will still retain certain amount of ambulatory property. This is required to translocate the animal on foot.

Touching the rump area or any portion on either side of the tail of the standing animal will help to test the level of sedation. This is done with a long pole, usually bamboo. If the response is little or very mild, the translocation process can be started. If there is not enough sedation depending up on the requirement an additional dose is given after 1 hour of the darting. Once satisfactory level of sedation is achieved noosing with polypropylene ropes can be started. A slow response is often due to subcutaneous injection of the drug or a haematoma, which may be formed at the site of injection. Haematoma formation is not rare when injection mechanism is a syringe charge. Subcutaneous injection may take place if the dart is hit tangentially.

Noosing

Polypropylene ropes are preferred over the chain, for throwing from a distance and pulling to the site of translocation. Four ropes are ordinarily used. There are preferably of polypropylene with 2 cm. diameter and 8 meters long. A ring made of iron with 8 -10 cms in diameter is tied at one end. If ring is nor readily available a use knot can be put at one end of the rope. But some thing heavy at the tip will help to throw the rope to a distance for this at times a piece of stone can be tied at the end if no metal ring is used. The rope is thrown from the back between the two hind limbs. The ring, which is to fall between the forelimb and the hind limb, is lifted and pulled back and the loose end is threaded through the ring and one of the hind limb is noosed. The threading of the loose end should be done as quickly as possible. While pulling the ring raise as much as possible. These are required since the animal is likely to lift its leg and escaped the noosed. The opposite fore leg is noosed in the same fashion. Noose the forelimb by throwing the rope between the forelimbs from the side of the elephants and not standing in front of the elephant.

Do the noosing standing close to the animal on its





side. The other handling and corresponding opposite forelimb is also used similarly. The elephant at times may try to hold the rope, bite or even pull. Giving oral commands as well as percussion commands could discourage this. At times prodding on the trunk will be necessary.

When all the four is noosed with rope, translocation can start. 10-15 people will hold and the elephant is coaxed to move by giving commands. Stern commands both oral percussion and even mild prodding be given. However, animal is insensitive to pain and hence and punishment causing pain or injury is of no use. Pulling of the rope on the forelimb simultaneously supports this, if the animal is to be moved forward. If the animal is to be moved backward the rope on the hind limb is pulled backward. The pulling is done alternatively with left or right limb. The animal's subconscious mind will work and obeys commands it will appear that the animal is obeying as if it is in a hypnotic trance. On many occasions it has been found that after certain distance of translocation if the animal is taken to the regular tethering site it refuses to move to the site proper. Probably the smell gives it an impression that it is to be tethered. The mahout or any other person with whom the animal is angry or harbours vengeance should not be employed. His or her voice or even smell can make animal aggressive. Even calling out for the chain or its sound will result in restlessness and response in the animal. The chain is physically lifted and carried in a gunny bag. The usual practice of hauling the chain on the ground will produce characteristic sound, which may make the animal restless.

Animal can be coaxed and translocated for a distance of 100-200 metres easily. If long distances are to be translocated mahout can mount on the animal and give commands. The animal will obey oral percussion and toe commands. This is also done if the terrain is uneven and the animal is likely to stumble. The hind limb is usually tied first at tethering site. Then the rope on the forelimb is extended and tied on to another tree. This is to prevent the animal to turn back while mahouts operate at the back. Then chains replace the ropes. Enough space, usually a distance of 60 cms is to be provided between the tree and the hind limb. This will enable the animal to lie down and get up without difficulty. A standard ball and socket joint chain is used to tie the hind limb. This will provide enough freedom for the moment. Water is pour all over the body particularly on the face to reverse the sedation. However, the animal is not allowed to lie down and sleep immediately. Care should be taken that the ground surface of the tethering site is even and level. This is to avoid difficulty for lying down and getting up. Too much of a slope is also to be

avoided. Reversal with Yohimbine or Yohimbine +4 Amino Pyridine is rarely done, since the animal by this time will be reasonably recovered. If severe sedation still persists anti dote can be given.

The team for the immobilisation usually carries necessary ropes with rings, detachable long hook in addition to the drugs and accessories.

Post-darting care

Disturbance, usually by the jubilant crowd around or the impatient mahout can pass delay in the complete on set up deep sedation. Not only darted animal may run long distances but also at times sedation may not set in at all. There had been occasions where elephants after darting have gone to tanks, river and even to sea. Once sedation sets in the water it is very critical. Animal will be unable to lift the trunk and breath. If the elephant is not towed to the side or bank accident can happen. Partially sedated animal can easily be towed to the side. However, after a couple of deep breath the animal can quickly swing back to violent and aggressive mood.

Lightening of sedation is another risk. This will happen in conditions like heavy fireworks after some degree of sedation or a quick sudden shower. In these context the animal has to be again checked for the depth of sedation before nosing.

Attempt to lie down by the animal is to be resisted. If it lies down it may go to sleep and may not be possible to make the animal to get up and translocated. When animal shows tendency to lie down disturb the animal with sounds, commands or even by prodding with stick or pole. Running in to darkness during night after darting is to be avoided. Hence dart the animal in the night only if you are sure that the moment can be controlled by, say compound walls as well as plenty of lights before, during and after darting. A laser beam sight if available can be used. Usually a good flashlight from the back of the syringe projector to the site of dart is good enough.

Animal after being hit by the dart is likely to attract or mock charge the darter. So make sure the strategy of your safety like building, hide, compound wall narrow lane, big tree, large trench, bridges etc. It may be noted that elephant can stand on its hind limb, hook the forelimb on the tree and reach out its trunk for the target O "you".

The penis will be protruded during the sedation and while translocating injury to penis especially by hitting on the chain has to be avoided. Take care of any wound or injury before the animal is fully revived.

Abscess formation at the site of injection can





happen since darting is not often possible by taking all the antiseptic precautions. Hence injections/infusions of an antiseptic to the site can be done as follows:

1. Remove the pressure inside the syringe unscrewing the tail piece, and then remove the barrel retaining the nosepiece (needle) on the animal body. Inject 3-5 ml of any broad spectrum of antibiotic (e.g. oxytetracycline) using a hand syringe through the dart needle. Remove the hand syringe put back the barrel on the nosepiece and pull out the entire dart. Pull out the syringe dart perpendicular to the body. If the dart is pull from the ground level the needle may get bent.

Drug immobilisation data sheet.

Date

Veterinarian

Area

Weather and climate

Temperature

Time Purpose.

Age Sex Weight (Appox.)

Other Details (E.g. Pregnant, injured, singleton etc.)

Time of tracking Time of Darting

Site of Dart

Drug Details

1.

2.

3.

Induction of Chronology

Time in Minutes 0 Darting Time

3

7

10 Etc.

Condition of the animal:

Veterinary attention given:

Undertaking

It is safe to have an undertaking got from the owner before tranquillisation is attended. A specimen is given below.

Undertaking for using tranquilliser gun on elephants.

Place _____

Date _____

I _____ son of _____ Under take that elephant named _____ aged _____ belongs to me and is uncontrollable. I have been properly appraised of the risk involved in darting the elephant with tranquilliser gun. I am prepared to bear the damage and loss including possible death of the animal, if any arising out of it. I am also prepared to pay for the cost and Consultancy charges.

Witnesses

Signature

1.

2.

Name

Tranquillisation and Elephant Welfare Association

Realising the importance of developing a safe method and protocol for tranquillisation and translocation of captive rogue bull elephants in Kerala, the Kerala Agricultural University launched a project. The project had Jacob V. Cheeran as the Principal Investigator and an elephant immobilisation team comprising of K.C. Panicker and K Radhakrishna Kaimal as members of the immobilising team. This team did its first darting on 24th April 1979 and completed 168 darting. Then the University discontinued the project, but it was taken over by the EWA and till so far 459 darting (September 2002) has been done. University conducted training programme every year for the field veterinarians in batches comprising of 10 -12 vets with resource persons from the EWA. It is heartening to note that these trained veterinarians are doing these works and at present there are such 6 teams working in Kerala. The EWA is often called upon for different situations both in the state and outside the state.

The expertise of the EWA members has been made available to treat wild elephants, translocating herds of wild elephants, radio collaring and various other research projects. Members of EWA have conducted various training programmes on elephant and other wild animals in various parts of India. They have also presented papers, both at National and International fora.

