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On leaves of *Toddalia asiatica,* Banasuran mala, Wyanad, 19.xi.1998, C.K. Biju TBGT 299, HCIO 43617.

***Meliola caesalpiniae* Hansf. & Deight. var. *indica* Hosag.& H. Biju**
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***Meliola capensis* (Kalch. & Cooke) Theiss. var. *allophylicola* Hansf. & Deight.**
On leaves of *Allophylus cobbe,* Kombe, Meenmutty, Thiruvananthapuram, 9.iii.1996, V.B. Hosagoudar TBGT 14, HCIO 42152; Idukki, 9.i.2001, Kamarudeen TBGT 390, HCIO 43826; *Allophylus* sp., Wyanad Periya, Wyanad, 27.xii.2002, M. Kamarudeen & P.A. Jose TBGT 2031.

***Meliola capensis* (Kalch. & Cooke) Theiss. var. *dimocarpi* Hosag. & Abraham**
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STUDY OF ANAESTHETIC EFFICACY OF DETOMIDINE-KETAMINE COCKTAIL IN BUDGERIGARS

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Now-a-days alpha-2-adrenocepter agonists are in common use as sedatives and anaesthetics for avian species because these are considered very effective, safe and easy to administer parenterally for surgical and non surgical procedures. Lees (1991) described that detomidine is a potent, non-narcotic, sedative, muscle relaxant and analgesic. High doses of detomidine produce deep sedation, leading to loss of consciousness and a light plane of anaesthesia. Freed and Baker (1989) reported that xylazine, detomidine and medetomidine are usually used in combination with ketamine. Valvered *et al.* (1993) stated that in most birds, intramuscular injections are best given in the pectoral muscles. In flightless birds, such as ratites, pectoral muscle mass is minimal, thus the thigh muscles are preferred. Heaton and Brauth (1992) stated that detomidine-ketamine combinations results in reduction of the required doses, smooth induction and recovery and better muscle relaxation. Muhammad *et al.* (1993) studied the anaesthetic effect of detomidine-ketamine in chicken. They reported that the use of detomidine-ketamine cocktail readily and smoothly induces loss of righting reflex, good muscle relaxation, hypoventilation while corneal reflex persists during anaesthesia. Booth and McDonald (1988) reported that among the dissociative agents, ketamine is the least potent anaesthetic and acts for the shortest period. It is a potent inhibitor of GABA binding in C.N.S. It induces amnesia and anaesthesia of stages I and II but not stage III anaesthesia. Valvered *et al*. (1993) concluded that ketamine is rarely used alone because it is associated with poor muscle relaxation, muscle tremors, myotonic contractions, opisthotonus and rough recoveries. The drug may be administered alone but is more commonly used together with either alpha-2-adrenergic drugs, diazepam or azaperone, depending on the species involved. In Pakistan different studies have been conducted on detomidine-ketamine cocktail efficacy in equine, canine, poultry and some exotic birds. This project was designed to study the anaesthetic and analgesic effect of detomidine-ketamine cocktail in budgerigars.

Experimental birds: Ten adult and healthy budgerigars (*Melopsittacus undulatus*), comprising of three males and seven females, were purchased from a local market (Lahore, Pakistan). All birds were kept in experimental room of Department of Pharmacology and Toxicology, University of Veterinary and Animal Sciences, Lahore, Pakistan. In the experimental room the birds were provided naturalistic environment and the temperature was maintained at 25^0C. Birds had *ad libitum* access to food and water.

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Fasting and pre-anaesthetic examination: Water and food were withheld 30min prior to drug administration to reduce chances of vomiting. A physical examination was carried out in all birds to assess the state of general health. This examination included recording body weights, body temperatures, respiration rates, heart rates, reflexes and checking for any injuries. Mean body weight of budgerigars was 30g.

Drug administration: For this study detomidine was used as 1% Inj. Domosedan by Farmos and ketamine was used as 5% Inj. Calypsol by Medimpex. Study was conducted in the operation theater of the surgery section, Department of Clinical Medicine and Surgery, University of Veterinary and Animal Sciences, Lahore, Pakistan.

To determine the detomidine dosage to be used in combination with ketamine at the dosage 40mg/kg b.w. (Heaton & Brauth 1992) three trial dosages of detomidine i.e. 1.2mg/kg b.w., 1.3mg/kg b.w. and 1.4mg/kg b.w. were selected within recommended dosage range for detomidine cocktails (Virtanen, 1986). Out of these dosages only one trial dosage, i.e., 1.4mg/kg b.w. induced anaesthesia as cocktail with 40mg /kg b.w. ketamine and was selected for this study.

Birds were administered detomidine-ketamine cocktail at the dosages 1.4mg/kg b.w. and 40mg/kg b.w. respectively in pectoral muscle (Valvered *et al.* 1993) using insulin syinge (1ml).

Parameters of study: The induction period, duration of anaesthesia, recovery period, degree and duration of analgesia, body reflexes (righting reflex, toe pinch reflex, feather plucking reflex, palpebral reflex, table knock reflex, pharyngeal reflex), body temperature, respiration rate and heart rate were taken as parameters of study.

In all birds respiration rate was recorded from sternal movements, heart rate was recorded with stethoscope keeping diaphragm on left costal side and temperature was recorded from axilla.

Results and Discussion: Detomidine-ketamine induced a rapid and smooth anaesthesia in all birds and mean induction period was 1.6 $\pm$ 0.64min. Anaeasthesia was smooth but light in nature. All birds showed dorsal recumbency during anaesthesia. Except three birds, eyes of all birds closed. Mean duration of anaesthesia was 70.2 $\pm$ 30.88minutes. Analgesia was very superficial and mean duration of analgesia was 27.5 $\pm$ 4.95minutes. Except toe pinch reflex all reflexes i.e. righting reflex, feather plucking reflex, table knock reflex, palpebral reflex and pharyngeal reflex were absent during anaesthesia. Birds showed severe hypothermia and body temperature dropped to 98.6 $\pm$ 3.43^{0}F during anaesthesia and it increased to 103 $\pm$ 0.10^{0}F at the time of complete recovery. Respiration rate per minute decreased to 53 + 25.48 during anaesthesia and increased to 100 $\pm$ 3.05 at the time of complete recovery. Heart rate per minute decreased to 150 $\pm$ 13.22 during anaesthesia and increased to 189 $\pm$ 21.36 at the time of complete recovery. Recovery from anaesthesia was extremely prolonged and rough due to the signs of neck and legs paralysis, fluttering and inability to lift up the head and body. Throughout the recovery period thermoregulatory measures were strictly followed to avoid aggravation of hypothermia and respiratory depression. Mean recovery period was 1132 $\pm$ 118.95min. During this study detomidine-ketamine cocktail did not cause any mortality at the dosage used and all budgerigars completely recovered after 48 hours.

Conclusion

From the results of this study this is concluded that because of prolonged and rough recovery period accompanied by severe hypothermia and respiratory depression, detomdine-ketamine cocktail is not a safe and desirable anaesthetic for budgerigars at the dose used.

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TWO CASES OF REHABILITATION OF RECUMBENT ELEPHANTS

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web supplement

Rehabilitation of recumbent large animals present a special problem for veterinarians. Once the animal becomes recumbent it develops bed sores due to unequal pressure on various areas. Fessler and Amstutz (1974) reported successful rehabilitation of a stallion having midshaft radial fracture which was immobilized with a combination of modified Thomas splint and plaster cast. They kept the stallion in a sling using a wider belly band. The present paper describes the rehabilitation methods adopted in two recumbent elephants.

Case 1: A cow elephant with swollen right hind leg at thigh region was located in the Chandaka wildlife division, Orissa. She had difficulty in walking as evidenced by drag impressions of hind legs in the path of her movement. As the animal was in dense forest it was decided to

[W] see images 1-10 in the web supplement at www.zoosprint.org

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