USE OF CABERGOLINE IN COMPANION BIRDS

John Chitty BVetMed CertZooMed MRCVS
JC Exotic Pet Consultancy Ltd.
Wombourne, Allington
Salisbury, Wilts SP4 ODD, UK

Aidan Raftery MVB CertZooMed MRCVS
Avian and Exotic Animal Clinic
221 Upper Chorlton Road
Manchester M16 0DE, UK

Alistair Lawrie BVMS MRCVS
The Lawrie Veterinary Practice
25 Griffiths Street
Falkirk FK1 5QY, UK

ABSTRACT: In many species breeding and nesting behaviours result from a hormone cascade induced by the influence of various external environmental factors. Prolactin is often the major/ initiating hormone. Cabergoline is a prolactin-inhibitor marketed for prolactin-related disorders in the bitch. This paper will present a series of cases where this drug has been used for reproductive-related disorders in psittacids, particularly persistent egg laying in cockatiels.

This paper forms an update of that presented by the authors in 2006 (Chitty et al., 2006).

INTRODUCTION

Reproductive disorders are common in companion psittacine birds. These include egg retention/ binding, dystocia, egg-related peritonitis, behavioural disorders and prolapses. One of the more common presentations is persistent egg-laying – budgerigars, cockatiels, lovebirds and finches being most commonly presented. Persistent laying may result in egg binding, osteoporosis, and malnutrition, and death (Speer, 1997; Bowles, 2006; Romagnano, 2005).

The causes of persistent laying include genetic factors, environmental factors, diet and imprinting on owner(s) or objects (Speer, 1997; Bowles, 2006; Romagnano, 2005).

Extrinsic factors will induce a hormone cascade resulting in ovarian stimulation and activity. In many species a fundamental hormone in this cascade, especially in nesting and laying behaviours, is prolactin (Vleck, 2002)

Excellent reviews on the role of prolactin have been published by Mans (Mans and Taylor, 2008; Mans, 2009) - prolactin plays a major role in incubation and breeding behaviour in a range of species. In some, mainly photoperiodic species, a rise in prolactin terminates breeding season. In budgerigars, prolactin has been shown to promote nestbox oocupation and incubation

The role of prolactin in regulation of clutch size does vary between species depending on whether they are photoperiodic or not, or whether they are synchronous/ asynchronous/ indeterminate hatching. In general prolactin is linked with cessation of laying though studies on the effects of prolactin inhibitors in gallinaceous birds do show contrasting results with increased egg laying in chickens and reduction in turkeys.

Conventional therapy includes altered management (non-removal of eggs, removal of nest site, mate (real or perceived), changes in cage location and layout), changes in photoperiod, improved nutrition, and hormonal therapy. Ultimately surgery (salpingohysterectomy) may be required (Speer, 1997; Bowles, 2006; Romagnano, 2005).

Hormonal therapies that have been advocated include medroxyprogesterone, testosterone, levonorgesterol, human chorionic gonadotrophin (hCG), and leuprolide acetate (Speer, 1997; Bowles, 2006; Romagnano, 2005).

Hormonal therapies are rarely sufficient on their own and may induce adverse side effects

These, however, often seem to reflect the concept that female reproductive behaviour is the abnormality. In fact, reproductive behaviour is normal and may be a sign of good health - the problem relates to its aberrant appearance and excessive prolongation, and this may relate to prolactin activity

Cabergoline is a prolactin antagonist. It exerts its effect by inhibiting prolactin release by direct stimulation of dopamine receptors in prolactin-releasing cells in the anterior pituitary (Bishop, 2005). In the UK it is licensed in the bitch for pseudopregnancy and suppression of lactation in bitches. It has also been used in the bitch for termination of pregnancy, behavioural modification, and in the medical management of pyometra.

MATERIALS AND METHODS

"Galastop" (cabergoline 50µg/ml; Ceva, Chesham UK) was used in the original study. The dose rate in dogs is estimated to be 5µg (3 drops)/kg daily. Therefore an estimated dose of 10-20µg/kg was the initial dose used in our cases. Higher doses were also used where there were difficulties in titrating dose or where it was felt a higher dose would be safe and more effective.

RESULTS

Case results are summarised in Table 1

TABLE 1 – CASE RESULTS

Case No	Species	Signalment and presentation	Dose	Results And Comments
1	Cockatiel	1yr. Female Egg laying	2 drops daily approx 30µg/kg	On therapy for 2.5 months with no eggs. Then started to lay again
2	Cockatiel	5yr. Female Egg laying	2 drops daily	On therapy 2 months. Egg laying stopped. Died of unknown cause
3	Cockatiel	2yr Female	1 drop daily	Egg laying stopped.
4	Cockatiel	5yr. female	5 drops daily	On therapy 7 months. No eggs
5	Red-lored Amazon	2.5yr. female Mutilating	4 drops daily approx 15µg/kg	Initially felt cyclical mutilating behaviour coincided with reproductive activity. Endoscopy confirmed ovarian activity. Cabergoline did not reduce mutilating but did reduce ovarian activity on endoscopy two weeks later. Final diagnosis = fungal encephalitis
6	Cockatiel	3.5yr Female Egg bound after persistent laying	1 drop daily approx 15 µg/kg	Egg laying stopped in conjunction with altered light cycles. No further egg laying until 2 months post-cabergoline therapy
7	Cockatiel	10yr Female Persistent laying	1 drop daily	Egg laying stopped with altered light cycles. When cycle returned to normal no further laying until cabergoline stopped. Laying stopped on resumption of therapy.
8	Cockatiel	2yr Female	1 drop daily	Egg laying stopped
9	Cockatiel	3yr female Egg bound on 4th egg of clutch	1 drop daily	Cabergoline given for 2 weeks. No further reproductive activity six months after therapy
10	Cockatiel	5.5yr female Persistent laying	0.1ml of 1:10 dilution daily for 1 week (approx 50µg/kg) Then once weekly for 8 weeks	No further eggs for eight months after therapy
11	Lovebird	Female, age unknown. Persistent laying	1 drop daily for 5 days (approx 20µg/kg) then 1 drop weekly	Temporary cessation of egg laying. Mate not removed. Suspect poor owner compliance resulted in resumption of egg laying
12	Eclectus	Female; 8 yrs Persistent nesting behaviour with regular egg-laying	4 drops daily. Approx 10µg/kg	Cessation of nesting behaviour within 48 hours

In addition three birds belonging to a cockatiel rescue were treated for persistent laying at 1 drop daily. However poor compliance was found with poor success.

Since this study was performed, cabergoline has been used in many other cases, including non-psittacids. These cases have included persistent laying problems in finches and laying soft-shelled eggs in backyard chickens. In all cases cabergoline has been combined with alteration of light cycles and behavioural modifications.

Cabergoline has also been used in combination with behavioural cases where sexual activity has been felt to be a contributing factor

DISCUSSION

Cabergoline appears to be a safe therapy in these birds. Although Case 2 died while on therapy it is believed that this was unrelated to the drug. Side-effects in the bitch include hypotension, vomition/ anorexia, coat colour changes and drowsiness. None of these were seen in our study birds and have not been observed since then even when used over several months as in one Electus parrot

It is also clear that cabergoline is not totally effective on its own and works best with changes in husbandry (eg removal of males, altered light cycle). This is similar to experiences with other drugs, eg hCG or leuprolide acetate.

It does have advantages to these drugs in that it is commercially available in a ready to use formulation, cost per bird is low and it is given orally by the owner.

A potential pitfall is the reliance on owners giving fixed daily doses over an extended period. This may be stressful to both owner and bird and hence result in poor compliance. In some cases it may result in increased owner-bird contact which may worsen the situation where the bird is sexually imprinted on the owner. It is also possible to argue the converse case where drug dosing may aid in breaking an unhealthy sexual bond between owner and bird

It also has the advantage that, unlike GnRH analogues, it does not act by initially stimulating a further hormone surge

As ever, it is hard to decide whether adding cabergoline to a behavioural regime actually improves clinical response. However, it is the authors' opinion that it does appear to reduce egg laying and sexual behaviours much faster than management changes alone. It is also apparently helpful to continue cabergoline while returning light cycles etc to normal as it certainly appears to helping prevent sexual activity recurring in this period.

Further work is needed to determine the dose rate more accurately and the use of concomitant therapies and management therapies when utilising cabergoline. It is also necessary to assess the exact effect of the drug in these birds - with many studies suggesting that prolactin blockers increase egg laying in some species it is possible that the apparent effects of cabergoline on persistent egg layers may not be via the prolactin system, but on the more fundamental dopaminergic system (Mans, 2009).

REFERENCES

Bishop, Y. 2005. The Veterinary Formulary. London, UK: Pharmaceutical Press

Bowles, HL. Evaluating and Treating the Reproductive System. In: Harrison, G and Lightfoot, T, eds. Clinical Avian Medicine. Palm Beach, FL: Spix Publishing: pp 519-539

Chitty, JR, Raftery, A, and Lawrie, A 2006. Use of Cabergoline in Companion Psittacine Birds. *Proc Assoc Avian Vet* pp 65-68

Romagnano, A. 2005. Reproduction and paediatrics. In: Harcourt-Brown, N and Chitty, J, eds. *BSAVA Manual of Psittacine Birds*. 2nd Ed. Gloucester, UK: BSAVA: pp222-233

Speer, B. 1997. Diseases of the urogenital system. In: Altman, R, Clubb, S, Dorrestein, G and Quesenberry, K, eds. Avian Medicine and Surgery. Philadelphia, PA: Saunders; pp 625-644

Mans, C and Taylor, WM. 2008. Update on Neuroendocrine Regulation and Medical Intervention of Reproduction in Birds. *Vet Clinics N Amer: Ex Anim Prac* **11**: 83-105

Mans, C 2009. Avian Prolactin: Regulation and Role in Reproductive Physiology - a Review. Proc European assoc Avian Vet pp 179-184

Vleck, CM. 2002. Hormonal control of incubation behaviour. In: Deeming, D, ed. Avian Incubation: behaviour, environment and evolution. Oxford, UK: Oxford University Press; pp 54-62