FURTHER NOTES ON THE USE OF CT 1341 IN BIRDS OF PREY

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CT 1341 ("Saffan", Glaxo Laboratories) was further tested on seven North American raptors. Due to reports of a possible but unproven adverse cardiac effect in cats (Edmonds 1973, Evans 1973, Evans and Austin 1972, Marshall 1972), heart and respiration rates were monitored immediately before and at intervals after intravenous injection of CT 1341. Methods were the same as in Cooper and Frank (1973); heart rate was monitored by stethoscope and respiration was counted visually.

Results

1. Golden Eagle (*Aquila chrysaetos*) OY 1100.
   Weight: 3460 g.
   Heart rate: 336
   Resp. rate: 32
   Dose: 1.0 ml (3.47 mg/kg)
   1.25 min.: eyes still open, struggling.
   Heart: 190 normal rhythm
   Resp.: 100
   2.5 min.: alert.
   Heart: 140, normal
   5 min.: standing.
   Heart: 240, abnormal rhythm
   Recovery uneventful.

2. Red-tailed Hawk (*Buteo jamaicensis*) OY 1545.
   Weight: 1170 g (low condition, one wing missing).
   Heart: 220
   Resp.: 60
   Dose: 0.8 ml (8.20 mg/kg)

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2.5 min.: No response to stimulation.
Heart: 180, abnormal rhythm
Resp.: 72
4.5 min.: leg and wing tremors.
6.25 min.: Heart: abnormal rhythm.
Resp.: 64
7.25 min.: eyes open
12.5 min.: standing
Heart: 200, normal rhythm
Recovery uneventful.

3. Red-tailed Hawk No. 2.
Weight: 1300 g.
Heart: 336
Resp.: 60
Dose: 1.0 ml (9.23 mg/kg)
1.5 min.: Heart: 170, abnormal rhythm
Apnea
2.5 min.: Heart: 120, weak
Apnea
3 min.: Heart stopped, bird died.
Post-mortem examination showed a focal hepatitis and hepatic cyst.

4. Red-tailed Hawk (immature) OP 1546.
Weight: 965 g (one wing missing)
Heart: 360
Resp.: 53
Dose: 0.6 ml (7.46 mg/kg)
0.5 min.: resumed breathing.
5 min.: no response to stimulation, flaccid.
Heart: 320+, abnormal rhythm.
Resp.: 80
7.5 min.: Resp. 44
8 min.: no response to stimulation, shivering.
9 min.: response to stimulation.
10.5 min.: eyes open.
11.5 min.: standing.
Recovery uneventful.

5. Great Horned Owl (*Bubo virginianus*) OY 1087.
Weight: 1090 g (broken wing)
Dose: 0.3 ml (3.30 mg/kg)
1 min.: no response to stimulation, wing tremors, eyes open.
2.5 min.: response to stimulation.
10 min.: struggling, unable to stand.

17 min.: standing
Recovery uneventful.

6. Short-eared Owl (*Asio flammeus*) OY 0797
   Weight: 325 g (missing left wing)
   Heart: 180
   Resp.: 58
   Dose: 0.15 ml (5.54 mg/kg)
0.5 min.: Heart: 190, normal rhythm
1.5 min.: Heart: 240, normal
   Resp.: 40
   Eyes open.
2 min.: no response to stimulation.
7 min.: no response to stimulation, slight wing tremors.
8 min.: response to stimulation.
   Heart: 240
15 min.: alert but unable to stand.
17 min.: standing.
Recovery uneventful.

7. Short-eared Owl OP 1543
   Weight: 310 g (missing right wing)
   Heart: 420
   Resp.: 50
   Dose: 0.15 ml (5.80 mg/kg)
40 sec.: Heart: 160, normal
2 min.: Heart: abnormal rhythm
4 min.: Heart: 240, normal rhythm
5 min.: Heart normal
   Resp.: 30
8 min.: no response to stimulation, body tremors.
10.5 min.: response to stimulation.
14 min.: struggling, alert.
20 min.: standing.
Recovery uneventful.

Discussion

These results are essentially similar to those obtained from African raptors; the weak effects on the Golden Eagle and Great Horned Owl were due to the light doses administered.

Abnormal cardiac rhythms were observed in six of the seven birds; the one exception was Short-eared Owl No. OY 0797, which received a dose only slightly lower than No. OP 1543 (5.54 mg/kg vs. 5.80 mg/kg). The arrhythmis was characterized by periods of very rapid fibrillation-like "flutter", often apparently superimposed on normal sinous rhythm. Normal rhythm was usually restored

by the time the bird showed response to stimulation; only in the case of the Golden Eagle was an abnormal rhythm detectable after the bird was able to stand.

The death of Red-tailed Hawk No. 2 was the first encountered using intravenously injected CT 1341; previously, a Lizard Buzzard (*Kaupifalco monogrammicus*) had succumbed after inadvertent injection of a heavy dose (82 mg/kg) into an abdominal air sac. The Red-tail failed to recover from the apnea that often occurs immediately after intravenous injection of CT 1341; normally the bird starts breathing again within 30 seconds, but in this case the heart gradually slowed and weakened, and breathing never resumed. *Post-mortem* examination showed that the bird had a focal hepatitis and a large hepatic cyst of unknown origin; death was probably associated with the liver's impaired ability to metabolize the steroid.

Because alphaxalone, the main component of CT 1341, bears a superficial resemblance to progesterone, discretion should be used in administering the drug to raptors being used in breeding experiments until more is known of its endocrinological effects in birds. Childe *et al.* (1972) tested it on rodents and reported weak antiuterotropic effects on the mouse, but no effect on growth, fertility or parturition of heavily dosed females. Offspring of tested animals were normal and fertile.

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