Hypercholesterolaemia in Some Recent Clinical Cases

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A review of the last 200 parrot blood profiles done at the Knox Bird Veterinary Clinic over the last 18 months revealed that six of the tested birds had blood cholesterol levels over 20 mmol/L. Fewer blood profiles were done on other species including pigeons and chickens during this time. None of these had cholesterol levels over 20.

In most parrot species, a cholesterol reading over 7 mmol/L is regarded as high.[1] A cholesterol value over 20 is therefore regarded as very high. A clinical summary of each of these six cases with cholesterol values in this very high range is outlined below:

1. A three year old female cockatiel was presented in thin condition with ascites and a history of being maintained exclusively on a dry seed diet. The bird's cholesterol reading was 30.9 mmol/L. Other abnormalities on the blood profile included an elevated GLDH (35 IU/L), elevated glucose (26.4 mmol/L), elevated white cell count ($22x10^9$/L), a low haematocrit (0.34 L/L), high calcium(3.3 mmol/L) and low total protein (25 g/L). On collection the blood was visibly lipaemic. It was thought that the marked lipemia may have affected some results, notably the Ca and total protein (TP) but that the results did confirm significant changes in lipid metabolism and liver parenchymal damage. This was thought to be due to the diet and associated hepatic lipidosis. The bird responded well to short term antibiotics and multivitamins and longer term dietary changes.

2. 'Buster' was a 28 year old female Sulphur Crested Cockatoo that was presented with massive abdominal distension. Blood was drawn and the results showed a cholesterol reading of 24.7 mmol/L together with an elevated urea (2.6 mmol/L), elevated Ca (5.1 mmol/L), elevated TP (42 g/L) and elevated white cell count ($15x10^9$). The haematocrit was normal but the mean corpuscular volume (MCV) was elevated (186 fL). The blood was markedly lipaemic. GLDH and bile acid levels were normal. Plain and contrast radiographs showed a large abdominal mass. The bird was taken to surgery where a laparotomy revealed a large tumor with multiple bowel adhesions. The decision was made to euthanise the bird. Histology was not done on the neoplasm or other tissues and the cause of the elevated cholesterol remains unclear, however the high fat diet given over many years was thought to be a principal factor.

3. A six year old female lutino cockatiel was presented because of a lump on her back. The lump was an enlarged uropygial gland. The gland was impacted with a high viscosity creamy white fatty substance. The bird was in generally poor condition, lethargic and had an unusual golden coloured plumage. Blood testing showed an elevated cholesterol (28.3 mmol/L), slight

anaemia (haematocrit 0.39 L/L) that was normochromic and normocytic.

Figure 1: Hypothyroidic cockatiel - impacted uropygial gland

Because of the elevated cholesterol, the nature of the anaemia and the overall clinical picture in particular the feather changes, thyroidal disease was considered. The bird was not obese however, but to the contrary, in light condition. Blood was drawn for a free T4 estimate. The free T4 estimate was <3.0 pmol/L. Based on the blood and feather changes and the free T4 result, thyroxin treatment was commenced. The suggested dose is 0.015 – 0.02 mg/kg.[4] A compounding chemist was contacted who formulated a thyroxin liquid to deliver a dose of 0.0015 – 0.002 mg in 1 - 2 drops twice daily. Treatment commenced in June 2006. The bird continues on treatment and remains well.

It was interesting that the hypercholesterolaemia, normochromic normocytic anaemia, lethargy, feather changes and low T4 were all consistent with hypothyroidism but the bird's light condition was not.[3] It may be that further testing at the time may have shown other concurrent health problems. Also interesting was that, after treatment commenced, the bird moulted the exceptionally gold feathers which were gradually replaced with the more muted yellow feathers of a normal lutino.

Figure 2: Hypothyroidic cockatiel – replacement of golden feathers with normally coloured feathers after the commencement of treatment.

4. 'Pretty Boy' is a 12 year old male budgerigar that lives in a retirement village near the clinic. He had been visited regularly, about every two months for two years to have his elongated upper beak trimmed. His owner had been advised that this may indicate a liver problem and that 'Pretty Boy' should be encouraged to eat a more nutritious diet and not his current diet made up exclusively of dry seed. In May 2007 'Pretty Boy's' owner contacted the clinic to say that 'Pretty Boy' was quiet and fluffed. He was collected and brought to the clinic. On examination, 'Pretty Boy' had an elongated upper beak, was thin and had green urates. A gram stain of his droppings showed a large number of gram negative rods. Blood was collected and showed an inflammatory leukogram (WCC $48x10^9$, band heterophils 8%, monocytes 30%) with an elevated cholesterol (37.6 mmol/L), elevated GLDH (8 IU/L), elevated bile acids (696 µmol/L), elevated AST (4211 IU/L) and low albumin (8 g/L), all reflecting a functional hepatopathy and hepatitis. 'Pretty Boy' was admitted, placed in a brooder and given antibiotics, multivitamins and crop fed Harrison's adult high potency formula. Early in the morning two days later, 'Pretty Boy' was found to be ataxic with a head tilt and circling. Based on his history, a CVA was suspected. With continued treatment and hospitalization, the head tilt resolved in three days. 'Pretty Boy' completed his conversion to pellets and was returned to the retirement village after another week.

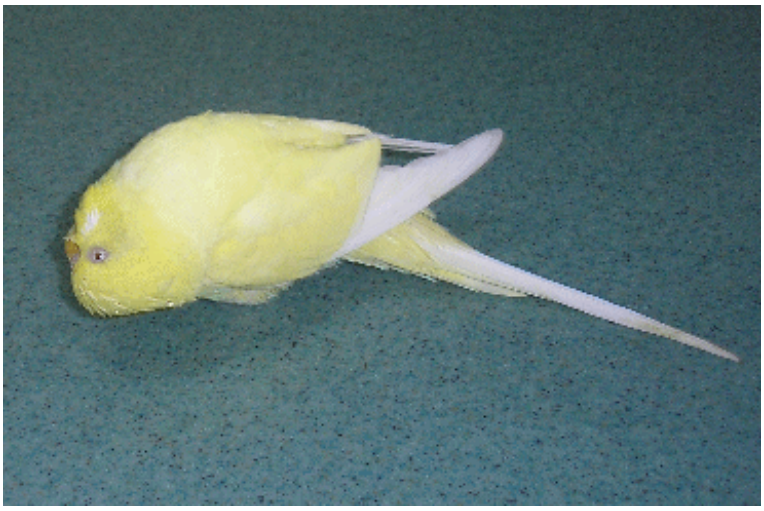

Figure 3: "Pretty Boy' – suspect CVA

5. An eight year old blue mutation Indian Ringneck was presented at the clinic after referral from another clinic with apparent neurological signs. On presentation the bird had a wide based stance and was leaning back on its tail which it was using for additional support. It had an upright posture with its head and neck drooping forward. With great regularity (approx 10 times per minute), it would shake and lift its head and had a generally decreased level of awareness. The bird had been fed a diet of sunflower seeds exclusively for at least the previous three years. The blood on collection was visibly pink rather than red and was reminiscent of a strawberry milkshake. The outstanding feature of the blood results was a cholesterol of 41.7 mmol/L. Other changes reflected the high level of fat in the diet and secondary hepatic lipidosis. As sunflower seeds are reported not to contain cholesterol it is likely that the hypercholesterolaemia was not associated with cholesterol intake directly but the overall high fat content of the diet and associated liver changes.[1] It was suggested that the oxygen carrying capacity of the blood and peripheral perfusion were sufficiently compromised to account for the fluctuating level of awareness, particularly as this worsened on exertion. The owner was advised to improve the bird's diet and a follow up phone call four weeks later revealed the bird to be still alive and apparently improved.

6. An 18 year old male Galah was presented for a beak trim. On presentation the bird had an elongated upper beak and was thin with a palpably enlarged liver. Interestingly, areas of grey on the wing coverts were developing a pinkish hue. The bird was maintained exclusively on a diet of dry seed. Blood was drawn and showed a cholesterol of 29.3 mmol/L. The blood was lipaemic. Other changes included an elevated AST (477 IU/L), globulins (27 g/L), an elevated Ca (2.5 mmol/L) and an elevated white cell count ($14.3x10^9$). The GLDH and TBA values were normal. It was thought that the hypercholesterolaemia reflected the sample's lipaemia and that the other changes were not of clinical significance. The owner declined further diagnostic work, which could have included radiography, a biopsy of the enlarged liver and testing for chlamydia. It does, however, appear as if the birds high cholesterol level in the absence of any significant other biochemistry changes was due to the high fat content of its diet. The bird's beak was trimmed and the owner was advised to improve the bird's diet.

Commonly described causes of hypercholesterolaemia include hypothyroidism, liver disease, bile duct obstruction, starvation and a high fat diet.[2,3] The causes of hypercholesterolaemia in this extremely small number of cases reflect these causes. In five cases (1, 2, 4, 5, and 6) the birds were fed high fat diets and in three of these (1, 4 and 5) there was evidence of concurrent liver disease. In the other case (3) the hypercholesterolaemia appears associated with hypothyroidism.

References

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