

HYPOTHYROIDISM IN BIRDS, LITERATURE REVIEW AND CLINICAL CASES



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INTRODUCTION AND OBJECTIVE

Endocrine pathologies of birds have been poorly documented in recent years and they should be included in the differential diagnosis of many clinical signs.

* The aim of this study is to do a brief review about the endocrine system and the thyroid gland of birds in order to give a detailed description about the hypothyroidism with the help of four real clinical cases.

THE ENDOCRINE SYSTEM OF BIRDS

Many anatomic structures are part of the endocrine system of birds, such as the thyroid glands. These glands are the main thyroxine (T₄) producers, and they both influence and are influenced by a wide number of physiologic, environmental and nutritional parameters (Orosz 1997).

The diseases that affect the thyroid gland can be caused by an increment of size (goiter) and a decrease (hypothyroidism) or increase (hyperthyroidism) of the normal performance (De Matos 2011).



CASE 1. QUAKER PARROT WITH OBESITY

Presenting complaint:

A 7 year old unknown gender Quaker parrot (*Mysitta monachus*) is presented with obesity.

History:

The bird lives indoor with another Quaker parrot. Its feeding is based on an exclusive seeds diet.

Physical examination findings:

On physical examination the bird appears to be overweight (190 g.).

Medical procedures:

Biochemistry	Results	Unit.	Ref. Val.
Parameter			
Total Cholesterol	876.2	mg/dL	120-400
Triglycerides	1240.3	mg/dL	50-300
Glucose	516.5	mg/dL	200-345
AST (GOT)	484	g/dL	125-345
GGT	36	U/L	0-0
Total Proteins	3.74	g/dL	3-4.2
Bile Acids Pre	52.9	μmol/L	15-55
Thyroxine (T ₄)	<0.5	μg/dL	4-11

Treatment:

600 mg of Gemfibrozil diluted in 10 mL of water PO BID, 150 mg of Silimarina diluted in 1 mL of carnitine PO BID and Levothyroxine PO 3 times a week in a 1:30 dilution.

Clinical progress:

Shock and death after recheck. Necropsy shows obesity, thyroid glands size decreased, pallor and friability of the liver with intraplasmatic vacuolization of the parenchima.



CASE 2. AMAZONA WITH CHRONIC LIVER DISEASE AND OBESITY

Presenting complaint:

A 6 year old male Amazon (*Amazona aestiva*) is presented for a recheck of liver chronic disease.

History:

The bird lives indoor. Its feeding is based on seeds, feed and fruits. It is under treatment for a liver disease since years ago.

Physical examination findings:

On physical examination the bird appears to be overweight (610 g.).

Medical procedures:

Biochemistry	Results	Unit.	Ref. Val.
Parameter			
Uric Acid	3.3	mg/dL	2.3-10
Urea	3.7	mg/dL	3.1-5.3
Total Cholesterol	675.2	mg/dL	180-305
Triglycerides	1647	mg/dL	49-190
Glucose	249	mg/dL	190-345
AST (GOT)	2460	g/dL	130-350
GGT	12	U/L	1-10
CK-NAC	270.5	U/L	55-345
Calcium	7.5	mg/dL	8.5-14
Phosphor	3.31	mg/dL	3.1-5.5
Bile Acids Pre	143.2	μmol/L	18-60
Total Proteins	2.99	g/dL	3-5
Thyroxine (T ₄)	<0.5	μg/dL	4-11

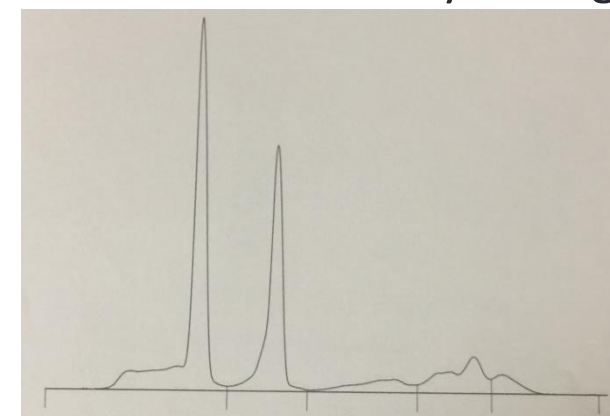
Treatment:

High quality feed and seeds prohibition. The bird keeps on treatment for the liver and Levothyroxine 20 μg/kg PO q48h is added.

Clinical progress:

The patient is losing weight. Biochemistry parameters are improving.

The treatment is being successful.



Electrophoresis of plasma proteins	%	Ref. %	Conc.
Fractions			
PreALb	48.5	55.8-66.1	1.45
Albumin	29.5	2.9-4.9	0.88
Alpha-globulin	6.4	7.1-11.8	0.19
Beta-globulin	11.6	8.4-13.1	0.35
Gamma-globulin	4.0	11.1-18.8	0.12
A/G	3.53		



CASE 3. YACKO WITH CHRONIC LIVER DISEASE AND OBESITY

Presenting complaint:

An 11 year old female Yacko (*Psittacus erithacus*) is presented for a recheck of liver chronic disease.

History:

The bird lives in a restaurant. Its feeding is based on seeds, feed and fruits. It is under treatment for a liver disease since years ago.

Physical examination findings:

On physical examination the bird appears to be overweight (665 g.).

Medical procedures:

Biochemistry	Results	Unit.	Ref. Val.
Parameter			
Total Cholesterol	1053.9	mg/dL	160-425
Triglycerides	1151.8	mg/dL	45-145
Glucose	252.3	mg/dL	190-350
AST (GOT)	205	g/dL	100-365
GGT	2	U/L	0.0-0.0
Potassium	2.01	U/L	2.9-4.6
Sodium	152.3	mg/dL	157-165
Bile Acids Pre	7.2	μmol/L	13-90
Chlorine	109.4	Mmol/L	0.0-0.0
Thyroxine (T ₄)	<0.5	μg/dL	4-11

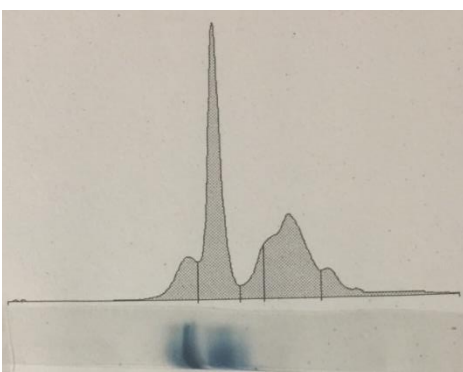
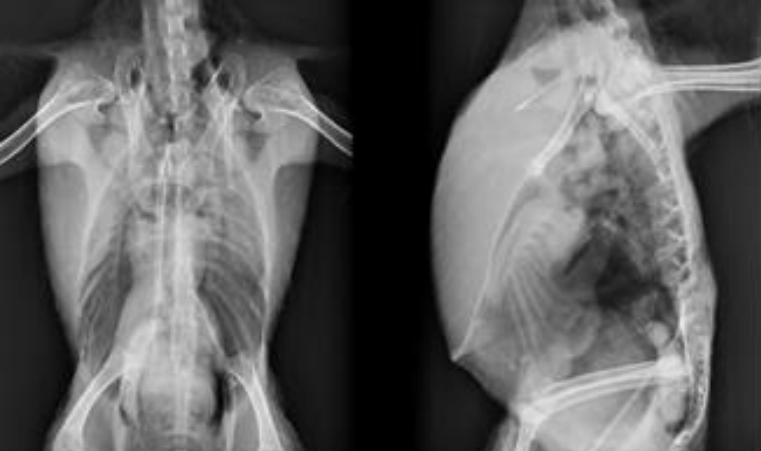
Treatment:

High quality feed and seeds prohibition. The bird keeps on treatment for the liver and Levothyroxine 20 mg/kg PO q48h in a 1:30 dilution is added.

Clinical progress:

The patient is not losing weight. Biochemistry parameters are improving. The treatment is being successful.

Electrophoresis of plasma proteins	%	Ref. %	Conc.
Fractions			
PreALb	48.5	55.8-66.1	1.45
Albumin	29.5	2.9-4.9	0.88
Alpha-globulin	6.4	7.1-11.8	0.19
Beta-globulin	11.6	8.4-13.1	0.35
Gamma-globulin	4.0	11.1-18.8	0.12
A/G	3.53		



CASE 4. ARATINGA WITH FEATHER DESTRUCTIVE BEHAVIOR

Presenting complaint:

An unknown age female Aratinga (*Aratinga mitrata*) is presented with feather destructive behavior.

History:

The bird lives indoor. Its feeding is based on high quality feed, greens and fruits and occasionally seeds. Feather picking started more than 8 months ago.

Physical examination findings:

On physical examination the bird weighted 200 g. Severe generalized feather loss and selfmutilation were seen.

Medical procedures:

FDB possible causes such as *Chlamydia psittaci*, fungal, parasitic, environmental or metabolic were discarded.

Biochemistry	Results	Unit.	Ref. Val.
Parameter			
Uric Acid	3.2	mg/dL	2.5-11
Urea	3.4	mg/dL	2.8-5.4
Total Cholesterol	848.6	mg/dL	120-400
Triglycerides	499.8	mg/dL	50-300
Glucose	344.8	mg/dL	200-345
AST (GOT)	214	g/dL	125-345
GGT	1	U/L	0-0
CK-NAC	875.8	U/L	35-355
Calcium	10.6	mg/dL	7-15
Phosphor	6.63	mg/dL	4-7.9
Bile Acids Pre	1	μmol/L	15-55
Total Proteins	2.85	g/dL	3-5
Thyroxine (T ₄)	<0.5	μg/dL	4-11

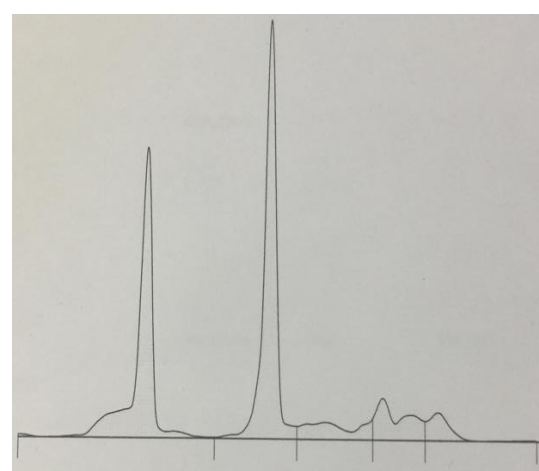
Treatment:

Levothyroxine 20 μg/kg PO q48h and recheck in two months. Since clinical signs are not improving after that time, treatment is changed to daily doses.

Clinical progress:

No more feather picking has been observed since increment of the treatment and normal plumage has grown back again.

Electrophoresis of plasma proteins	%	Ref. %	Conc.
Fractions			
PreALb	35.7	55.8-66.1	1.02
Albumin	42.7	2.9-4.9	1.22
Alpha-globulin	7.4	7.1-11.8	0.21
Beta-globulin	9.4	8.4-13.1	0.27
Gamma-globulin	4.8	11.1-18.8	0.14
A/G	3.6		



CONCLUSIONS

- The hypothyroidism is an endocrine disease with many different clinical presentations and it should be included in the differential diagnosis of FBD, obesity and chronic liver disease.
- The most commonly altered biochemical results are hypercholesterolemia, hypertriglyceridemia, hyperglycemia and bile acids increase.
- Radiographs and blood tests are not specific enough to diagnose hypothyroidism and histopathology or TSH stimulation test will be always needed in order to ensure the proper performance of the thyroid gland.
- The main problem of TSH measurement techniques, such as RIA, is the high price and the large volume of blood needed.
- Levothyroxine a 20 μg/kg PO q48h after TSH stimulation test seems to be showing successful results.
- Both the low reliability and specificity of baseline T₄ levels and the fact that they are influenced by stress, temperature, infections, food intake, drugs and handling, complicate the proper diagnosis of hypothyroidism and make it questionable in many reported cases.

LITERATURE

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