Diabetes Insipidus

Dr. Ed Neufeld B.A. M.Div. D.V.M.

Chief Complaint

Lady is a 6 year old female spayed poodle with a chief complaint of drinking excessive amounts of water during the past 30 days.

Lady

History

- Lady is a 9 year old 15 kg spayed Poodle
- Lady is drinking excessive amounts of water during the past 30 days. She seems to thirsty all the time.

Physical Examination

- Bright and alert
- Temperature 38.0 degrees C
- Heart rate 100 bpm
- Respiratory rate 15 per minute
- Appears normal on physical examination

Problem List

- PU/PD

Rule Outs

- List all the Possible Diagnoses
- *This list is your Rule Out list*

Rule Outs

- Hyperadrenocorticism
- Diabetes Mellitus
- Liver Disease
- Hypoadrenocorticism
- Pyometria
- Diabetes Insipitus
- Hyperthyroidism in cats
- Hypercalcemia
- Psychogenic polydipsia
- Renal failure

The Plan

- What is your PLAN ?

Plan

- CBC/Chemistry/Urinalysis
- Ask owner to measure exactly how water does Lady drink.

CBC/Chemistry/Urinalysis

- RBC – 5.5 x 103 (5.5-11.0)
- PCV – 45 (37-55)
- Phosphorus 3.1 mg/dl (3.1-7.5)
- Bilirubin 0.5 mg/dl (0.0-0.9)
- ALT – 200 u/l (12-130)
- ALKP – 150 u/l (14-111)
- USG – 1.006
- Lady is drinking 8 cups/day (4.8 cups/day – 60-80 cc/kg/day)

Interpretation of lab results

- USG – 1006 – hyposthenia
- Excessive water consumption

What is your diagnosis?

- Hyperadrenocorticism (Cushings Disease)
- Diabetes Mellitus - should have high blood glucose
- Liver Disease
- Hypoadrenocorticism (Addison's Disease)
- Pyometria
- Diabetes Insipitus)
- Hyperthyroidism in cats
- Hypercalcemia
- Psychogenic polydipsia
- Renal failure

What is your diagnosis?

- Hyperadrenocorticism - should have a high serum alkaline phosphtase (SAP)
- Diabetes Mellitus - should have high blood glucose
- Liver Disease – should have high liver enzymes
- Hypoadrenocorticism – should have low Na and high K
- Pyometria – should have a very high WBC
- Diabetes Insipitus – **Likely** USG < 1.010 (hyposthenuria)
- Hyperthyroidism in cats – should have a high T4
- Hypercalcemia – should have a high calcium
- Psychogenic polydipsia – USG of 1.012 or greater
- Renal failure – should have increased BUN, sCr, and isosthenuria urine (1.010)

What is your Diagnosis?

Diabetes Insipitus : suspected not confirmed

- Other possible causes of PU/PD have been ruled out
- USG < 1.010 (hyposthenuria) our dog was 1.006

- What is the etiology? Two types
  - CDI (Central Diabetes Insipitus) inadequate secreation of ADH (Antidiuretic Hormone)
  - NDI (Nephrogenic Diabetes Insipiutus) kidney insensitive to ADH

Tests to confirm Diabetes Insipitus (DI)

- Modified water deprivation test
  - Decreasing the water intake should increase USG in a normal dog
  - Decrease the water intake over a few days
  - If USG increases the dog does not have DI
  - If the USG stays the same the dog has DI
- ADH supplementation trial
  - Inject synthetic ADH (DDAVP) positive test – water intake decreases by 50%

Results of these tests

- Modified water deprivation test
  - The USG stays at 1.006

ADH supplementation trial

The water intake decreases by at least 50%

So what is your final diagnosis?

Final Diagnosis

- Diabetes Insipitus
- Type:
  - decrease in production of ADH OR
  - renal insensitivity to ADH

Treatment Plan

- For inadequate secretion of ADH
  - Desmopressin (1-2 drops intranasal or into the conjunctival sac.
- For renal insensitivity to ADH
  - Hydrochlorothiazide

Why does a diuretic work with NDI?

- Hydrochlorothiazide is a thiazide diuretic that **decreases urinary volume in the absence of ADH**. It may induce mild volume depletion and cause proximal salt and water retention, thereby reducing flow to the ADH-sensitive distal nephron

Prognosis

- Prognosis is good
  - Drugs are expensive
  - CDI – Central Diabetes Insipitus – easier to treat than NDI