



Toxicology

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Chief Complaint

- “Brutus” is a 7 year old male Husky who as presented with a history of vomiting, lethargy, ataxia and head tremors.

Brutus



History

- Brutus became acutely ill .
- Vomiting – 3 times this morning
- Very lethargic and depressed
- Head tremors
- Ataxia
- Polyuria/Polydipsea

Physical Examination

- Temperature 37 degree C
- Heart Rate – 110 bpm
- Lethargic
- Ataxia with knuckling
- Decreased withdrawal reflex
- Head Tremors

Problem List

- Head tremors
- Ataxia with knuckling
- PU/PD

Rule Outs

- List of all the possible diagnoses
- This is your Rule Out List

Rule Outs

- Marijuana Toxicosis
- Ketoacidotic diabetes mellitus
- Pancreatitis
- Central Nervous System Disease (CNS)
- Toxin – poisoning

Plan

- Make a Plan – Diagnostic Tests
- List the Diagnostic Tests

Plan

- CBC and Serum Chemistry
- U/A
- cPL

CBC and Blood Chemistry

- WBC - 22×10^3 (6-17)
- Neutrophils - $12.3 \times 10^3 \text{ mm}^3$ (3.2-10.8)
- Lymphocytes - $0.25 \times 10^3 \text{ mm}^3$ (0.54 – 3.44)
- PCV – 60 (37-55)
- K^+ - 6.0 nmol/l (3.4 -4.9)
- Ca – 0.85 nmol/l (1.12-1.4)
- Glucose 160 mg/dl (70-143)
- Phosphorus 9.2 mg/dl (2.5-6.8)
- BUN – 60 mg/dl (7.0-27)
- SCr. – 15 mg/dl (0.5-1.8)
- Low Total PCO_2 , plasma bicarbonate and blood pH,

Blood Gases

- Does the Blood Gases in our case:
- (Decreased Total CO₂, HCO₃, Blood pH)

Indicate

- Metabolic Acidosis or Metabolic Alkalosis?

Blood Gases

- Metabolic Acidosis

Urinalysis

- USG – 1.010 (> 1.030)
- pH – 5.8 (7.35-7.45)
- Sediment: crystals

Crystals found in the Urine

What type of crystals are these?



Crystals found in the urine

- Calcium Oxalate Crystals

New Rule out List

- After seeing the laboratory results do you want to add or subtract Rule Outs from your list?
- If so list the additions or subtractions to your Rule Out list. Give reasons for your choices.

Rule Out List (original)

- *Which ones do you want to keep or subtract?*
- Marijuana Toxicosis
- Ketoacidotic diabetes mellitus
- Pancreatitis
- Gastroenteritis
- Central Nervous System Disease
- Toxin – poisoning

New Rule Out List

- Marijuana Toxicosis – unlikely does not have renal failure
- *Ketoacidotic diabetes mellitus* – subtract – not supported by laboratory results – no urine ketones
- *Pancreatitis* – subtract – not supported by laboratory results – amylase/lipase and cPL normal
- **Central Nervous System Disease** – likely - ataxia
- **Toxin – poisoning** - likely – head tremors - ataxia

Rule Out List (Additions)

- Which Rule Outs would you like to add after seeing the laboratory results ?

Rule Out List

- Central Nervous System Disease
- Toxin – poisoning
- **Addition:** Renal Disease

Renal Disease: Etiology?

- List the possible etiologies of the renal disease.

Renal Disease: Etiology?

- Renal Disease
- Etiology?
- Nephrotoxins: aminoglycoside, ethylene glycol
- Plants: lily (cats only) grapes, raisins
- End Stage Chronic Renal Failure

New Rule Out List

- Central Nervous System Disease
- Toxin – poisoning
- Nephrotoxins: aminoglycoside, ethylene glycol
- Plants: lily (cats only) grapes, raisins
- End Stage Chronic Renal Failure

Diagnosis?

- Which disease causes (CNS) Central Nervous System signs together with renal failure and metabolic acidosis in dogs?

Diagnosis?

- Ethylene Glycol Poisoning

Additional Test

- EGT (Ethylene Glycol Test Kit)

What is the Treatment?

- Treatment?

Treatment

- Goal – stop the metabolism of Ethylene Glycol
- IV fluids + bicarbonate to correct acidosis
- Fomipizole – Alcohol dehydrogenase (ADH) inhibitor – stops the metabolism of ethylene glycol
- Ethanol – inhibits ethylene glycol metabolism by having a high affinity to ADH

Prognosis?

- What is the prognosis

Prognosis?

- Untreated – death due to renal failure
- Treated within 5 hours – excellent
- Treated within 8 hours – most recover
- Treated greater than 8 hours - guarded



The End























































