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Vomiting, Lethargy, & Ataxia in a Dog

Zoey, a 4.5-kg 4-month-old intact female mixed-breed dog, was presented for vomiting, lethargy, ataxia, and pale mucous membranes of 1 hour's duration.

History. The dog had been healthy, but a container full of different pills and a bottle of eyedrops had spilled a few hours previously. The owner could not account for 1 tablet of adult low-strength aspirin (81 mg), 1 tablet of calcium supplement (200 mg), and about 3 ml of eyedrop solution (0.2% brimonidine).

Physical Examination. At presentation, the dog was depressed and ataxic and had pale mucous membranes. The dog's rectal temperature was 98.8°F, pulse rate was 40 beats/minute, mean arterial blood pressure was 100/55 mm Hg, and respiratory rate was 30 breaths/minute. Abdominal palpation was inconclusive due to a tense abdomen. The dose calculations of the missing medications were as follows: aspirin, 18 mg/kg; calcium, 44.4 mg/kg; and brimonidine, 1.32 mg/kg.

Laboratory Analysis. Analyses included measurement of hematologic values and serum biochemistry/electrolyte levels, evaluation of fecal samples, urinalysis, and abdominal radiography. The **Table** shows significant findings.

ASK YOURSELF ...

- On the basis of the history and clinical signs, which of the 3 medications is most likely the cause of the dog's condition?
- What other conditions might result in similar clinical signs in this dog?
- Are the signs of hyperglycemia incompatible with the suspected diagnosis?

Important Diagnostic Findings

Variable	Result	Reference Interval
Serum Biochemical Profile		
Alkaline phosphatase (IU/L)	130	15–127
Aspartate aminotransferance (IU/L)	50	15–43
Glucose (g/dL)	173	70–118
Fecal Flotation	Negative	n/a
Abdominal Radiographs	Normal	n/a

Diagnosis: Gastrointestinal and cardiovascular signs due to brimonidine toxicosis

Brimonidine is an α-2 adrenergic receptor agonist that acts by reducing aqueous humor production and increases uveoscleral outflow. It is more selective for α-2 than for α-1 adrenoreceptors. Its peak ocular hypotensive effect occurs 2 hours after dosing. After ocular administration of a 0.1% or 0.2% solution, plasma concentrations peak within 0.5 to 2.5 hours and decline with a systemic half-life of approximately 2 hours. In humans, brimonidine is metabolized primarily by the liver, and urinary excretion is the major route of elimination.

On the basis of cases from the ASPCA Animal Poison Control Center, clinical signs in dogs can be seen at or below 0.18 mg/kg. The most commonly reported signs are bradycardia, depression, hypotension, pallor, weakness, vomiting, and hypothermia. Other signs reported are shock, weak pulses, and poor capillary refill time.

Laboratory Tests & Diagnosis. Tentative diagnosis may be based on history and clinical signs. No significant laboratory abnormalities are expected, although in some cases transient hyperglycemia has been noted. Therefore, glucose levels should be monitored.

Treatment. The goals of successful treatment of brimonidine overdose include management of life-threatening signs and supportive care. Induction of emesis is not recommended because of the possible acute onset of central nervous system depression, which may increase the risk for aspiration. Activated charcoal at a dose of 1 to 2 g/kg may be helpful in adsorbing brimonidine, but only within 30 minutes of ingestion because brimonidine is rapidly absorbed.

Body temperature, blood pressure, and heart rate should be monitored periodically. In critically hypotensive patients, administer shock doses of isotonic intravenous fluids for volume expansion. The **Box** lists specific agents to use for brimonidine toxicity.

DID YOU ANSWER ...

- The given history and clinical signs are compatible with brimonidine toxicosis.
- Differential diagnoses may include ingestion of other hypotensive agents, such as calcium-channel blockers, β-blockers, angiotensin-converting enzyme inhibitors, clonidine, amitraz, and ivermectin.
- Hyperglycemia is occasionally reported in cases of acute brimonidine toxicosis, but other potential causes of hyperglycemia should be ruled out.

See Aids & Resources, back page, for references, contacts, and appendices.
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Tx at a glance

Clinical Signs	Treatment	Dose
Hypotension & bradycardia	Yohimbine	0.1 mg/kg IV
	Atipamezole	50 µg/kg IM
Hypotension	Isotonic fluid	IV shock dose
Respiratory depression or coma	Naloxone	0.02 mg/kg IV or IM