



VETERINARY VOICE: Tips of the Trade

Critical Care- Xylitol Toxicity

What is xylitol and why is it toxic to dogs?

- A sugar alcohol used as a sweetener in an increasing number of sugar free chewing gums, candies, baked goods and other products.
- Xylitol consumption in dogs can be life threatening. It causes a dose-related release of insulin, greater than the amount released in response to an equal dose of glucose, which could result in a dramatic drop in blood glucose concentrations. This response is triggered by ingestion of even a small amount of xylitol.

What are the signs?

Clinical signs may begin < 30 minutes or up to 12 hours after ingestion. Vomiting is usually the first sign of canine ingestion of xylitol. Other clinical signs that may follow include lethargy, ataxia, collapse and seizure.

When do clinical signs of toxicosis occur?

If a dog ingests 0.1 g/kg of xylitol or more it should be hospitalized for supportive care and monitored for hypoglycemia. Dogs ingesting > 0.1 g/kg are at risk for hypoglycemia while those ingesting > 0.5 g/kg are at risk for hepatotoxicity.

Laboratory abnormalities?

- Initial blood work most often shows profound hypoglycemia. Other common serum chemistry abnormalities include hypokalemia, because of insulin's effect on shunting potassium into cells, and hypophosphatemia since insulin can increase cellular permeability to the phosphate ion.
- Dogs that have developed acute hepatic necrosis in association with xylitol ingestion demonstrate the following: Elevated alanine transaminase, Bilirubinemia, prolonged prothrombin and partial thromboplastin times, mild SAP elevation, thrombocytopenia

Treatment recommendations?

Obtain baseline glucose, potassium, phosphorus, and total bilirubin concentrations; liver enzyme activities and coagulation measurements.

- Induce emesis if ingestion was recent.
- Activated charcoal is not needed since it does not effectively bind xylitol.
- Monitor blood glucose concentrations every 2 hours for at least the first 12 hours, and monitor the other parameters within 72 hours of admission.
 - If hypoglycemia develops, administer a 1- to 2-ml/kg bolus of 25% dextrose intravenously and provide intravenous fluids containing 2.5% to 5% dextrose in order to maintain normal glucose concentrations. Treatment may be needed for 12 to 24 hours or until glucose concentrations can be maintained without supplemental dextrose.
 - Correct severe hypokalemia (< 2.5 mEq/L) by adding potassium to the fluids.
 - Consider liver protectants and antioxidants if there is evidence of liver injury. N-acetylcysteine (140 to 280 mg/kg loading dose followed by 70 mg/kg intravenously or orally q.i.d.), S-adenosylmethionine (Denosyl 17 to 20 mg/kg/day orally), or vitamin E (100 to 400 IU orally b.i.d.) may be useful.

Plasma transfusions and/or blood transfusions may be needed if a coagulopathy develops.

Prognosis?

The prognosis for uncomplicated hypoglycemia is good with prompt treatment.

Mild increases in liver enzyme activities usually resolve within a few days with supportive care. On the other hand, if severe elevation of liver enzyme activities, hyperbilirubinemia, and coagulopathy develop, the prognosis is guarded to poor.

Questions?

Critical Care Experts:
Heather Connally, MS, DVM, DACVECC
Stacy Armstrong, DVM, DACVECC

The Veterinary Specialty Center of Tucson has a board-certified criticalist caring for critical cases every day of the week. They are also available to answer questions or accept referrals 7 days a week. The critical care service is open 24 hours a day and is staffed by highly trained doctors and technicians at all times. Board-certified criticalists have four additional years of training after veterinary school and are certified by the American College of Veterinary Emergency and Critical Care to assure competency in advanced veterinary critical care.