

GRAPE AND RAISIN TOXICITY IN DOGS

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Grapes and raisins
can be toxic to dogs.



The phone rings at the clinic and a concerned owner is on the other end. A few hours ago, her 80-lb (36-kg), 5-year-old German shepherd, Muffin, had ingested 1 lb (0.45 kg) of grapes. The owner says that Muffin appears fine and is currently at the water bowl. However, the owner had just read something in the paper about grapes being toxic to dogs. She wants to know if what she had read was true.

Dogs are exposed to grapes and raisins in many ways. Frequently, dogs will eat fruit off the vine, steal from plates, and even eat wine pressings. Grapes and raisins have been recommended as treats and training aids because fruit is tasty and relatively low in calories. Unfortunately, dogs can have dangerous reactions to grapes and raisins. Between January 2001 and August 2004, over 200 calls were made to the ASPCA Animal Poison Control Center¹ involving potential exposures to grapes or raisins in dogs. Sensitive dogs have a risk of initial gastrointestinal upset followed by acute renal failure (ARF). This column discusses clinical signs and treatment of grape and raisin toxicosis in dogs.

MECHANISM OF ACTION

In cases of grape or raisin toxicosis in dogs, the actual mechanism of

action remains unknown. The exact pathophysiology of ARF following the ingestion of grapes or raisins remains undetermined.² Theories include metabolic disruption, a nephrotoxic mycotoxin, and an idiosyncratic reaction.^{2,3} Dogs that have developed ARF were exposed in various ways. Ingestions included grapes purchased from a grocery store as well as grapes found in the backyard, grape pressings from wineries, and both the seedless and seeded varieties. Some of the grapes involved were tested for pesticides, heavy metals, and mycotoxins (all findings were negative). It is unclear if the skin of the grape must be ingested for ARF to occur. Currently, grape-seed extract is not considered a threat; only the grape or raisin itself is considered a danger. So far, dogs are the primary species affected. Whether other species are affected remains unknown.⁴

CLINICAL SIGNS

At this time, the lowest documented toxic grape or raisin dose is 0.32 to 0.65 oz/kg.⁵ Without knowing the exact mechanism of action, all cases of grape or raisin ingestion should be considered potentially serious. Vomiting is one of the initial signs of grape or raisin toxicity and can occur within the first 2 hours. Other initial signs that can occur within the first 5 to 6 hours of exposure include diarrhea, lethargy, and polydipsia. Signs of ARF may develop either within 24 hours or several days after exposure. Signs of ARF may include anorexia, lethargy, depression, vomiting, diarrhea, abdominal pain, tremors, and hypovolemia. Changes in the patient's blood chemistry may be noted and mainly involve hypercalcemia, blood urea nitrogen, creatinine, and hyperphosphatemia.¹⁻⁷ Tubular degeneration and necrosis of the kidneys may follow. Tubular necrosis may be seen on histopathology.² Mineralization of the kidneys has also been seen in some cases.²

DIAGNOSIS

Clinical signs of grape or raisin toxicosis are similar to those of other causes of ARF. Diagnosis of grape tox-

icity is based on history of exposure, type of clinical signs, and evidence of ARF. Chemistry profiles should be used to evaluate the function of the kidney. Other common differentials for ARF, such as ethylene glycol ingestion, trauma, and other disease processes, should be discussed.

TREATMENT

Management of a patient with grape or raisin toxicosis depends on the animal's initial presentation. Decontamination by emesis, followed by administration of activated charcoal, is important in all recent ingestions. Emesis should be induced within the first 2 hours after exposure.¹ The longer emesis is delayed after exposure, the less likely it is to be effective. Fluid diuresis for the first 48 hours may help prevent ARF from developing. Blood chemistry values, including renal enzymes, should be monitored for 72 hours. Medications such as furosemide, dopamine, or mannitol can be used in anuric renal failure. Hemodialysis or peritoneal dialysis may be of benefit if available. Basic supportive care and monitoring during hospitalization is important.^{1,5,7}

ROLE OF THE TECHNICIAN

The role of the veterinary technician is very important in these exposures. Dog owners need to be educated that grapes and raisins may cause serious illness in their pets. A potentially life-threatening situation may be avoided if owners are aware of the risk.

PROGNOSIS

Prognosis depends on many factors. Condition of the animal on presentation, success of decontamination, and progression of clinical signs can help determine the outcome. Prognosis is favorable if the basement membrane of the kidneys remains intact and supportive care is implemented. If the dog becomes anuric, the prognosis is poor.^{2,4,5}

After successful decontamination and fluid diuresis, Muffin returned home. Only a few years ago, Muffin

might have died from an unexpected and overlooked toxicosis. Today, with new knowledge, technicians can make a life-saving difference in the lives of their patients.

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