Phenylpropanolamine—Not Without Risk

Phenylpropanolamine (PPA) is a sympathomimetic amine with a molecular structure similar to amphetamine but is considerably less potent. This drug was removed from the human market because of a large number of reported adverse reactions, such as hypertension, cardiac arrhythmias, myocardial infarction, acute renal failure, and such neurologic abnormalities as seizures and stroke. However, the drug is still used in veterinary medicine as an effective treatment for urethral sphincter incontinence.

In this case study, a 5-year-old, 29-kg, intact female Labrador retriever presented with tachypnea, tachycardia, and ataxia after accidental ingestion of approximately 48 mg/kg PPA. Laboratory abnormalities included thrombocytopenia and elevated levels of liver enzymes, bilirubin, creatinine kinase, and cardiac troponin I. Electrocardiography showed sustained ventricular tachycardia and intermittent fusion beats. Echocardiography revealed a focal dyskinetic region in the dorsal interventricular septum and left ventricular dilatation with reduced left ventricular function. The dog improved during hospitalization after being stabilized with lidocaine, enalapril, and atenolol. She was discharged on day 6 and sent home on enalapril and atenolol. An evaluation 6 months later showed the dog to be clinically normal. Resolution of the focal dyskinesis and improved left ventricular function were observed on echocardiography. The abnormalities and their transient nature as seen in this case were consistent with myocardial necrosis from infarction or direct catecholamine-induced cardiac toxicity.

In humans, there is a narrow therapeutic index of PPA in relation to its cardiovascular effects. In dogs, the recommended dose of PPA for treating urethral sphincter incontinence is 1.1 mg/kg PO Q 8 H. The therapeutic range and toxic dosages of this drug in dogs, however, require further study. While the dog in this case ingested an unusually high amount of PPA, authors note that the therapeutic index is narrow and its potential for cardiac and other toxicity should be recognized.

COMMENTARY: Phenylpropanolamine is commonly dispensed and this is a good reminder that it is not without risks. Used for many years in humans, it was withdrawn from the market because of an increased risk for hemorrhagic strokes. The amount of PPA this dog consumed was quite high, but because the therapeutic index is narrow, awareness of the potential problems is important.—Patricia Thomblison, DVM, MS

Cardiac toxicity from phenylpropanolamine overdose in a dog. Crandell JM, Ware WA. JAAHA 41:413-420, 2005.