

Detecting Rodenticide



Anticoagulant rodenticides inhibit the production of clotting factors that depend on vitamin K₁ (ie, factors II, VII, IX, X). Without these factors, dogs can develop life-threatening bleeding. The second-generation anticoagulants (eg, brodifacoum, bromadiolone, difenacoum) have longer half-lives than first-generation anticoagulant rodenticides (eg, chlorphacinone, warfarin) and are thus more toxic.

This study evaluated a point-of-care anticoagulant rodenticide lateral flow analyzer to determine whether it could detect 6 different rodenticide compounds: warfarin, pindone, chlorphacinone, brodifacoum, bromethalin, and the bromethalin metabolite desmethylbromethalin. Each anticoagulant was added at varying concentrations to a sample of serum taken from a healthy canine donor. An anticoagulant rodenticide lateral flow analyzer was able to detect warfarin, even at low concentrations. The analyzer could not detect any of the other anticoagulant rodenticides. Because this analyzer could not detect more common second-generation anticoagulant rodenticides, caution was advised. History of exposure and clinical signs, in addition to coagulation testing, must be considered when making a diagnosis of rodenticide toxicity.

Global Commentary

In the first month of my internship, a dog presented with dyspnea, hemoptysis, epistaxis, lethargy, ventral hematomas, and signs of hypovolemic shock. Several hours after treatment was started with vitamin K₁ and blood transfusions, the owner discovered the dog had eaten an entire package of rodenticide—but what kind? First- or second-generation? I remember wishing we had a quick, specific test for rodenticide intoxication, as it would make the diagnostics easier and save time. Sadly, this is still the Achilles' heel of our approach to rodenticide intoxication: the lack of a sensitive, specific test that is easily available and provides rapid results.

An ideal test would be inexpensive, easy to interpret, performed at patient side, and would test for several rodenticides at the same time. Although recent studies have described the use of several tests with a high degree of success, they do not provide immediate results and require specialized equipment. While the test evaluated here only detected warfarin, there is still merit: negative study results need to be published, as they can promote further refinements and paradigm changes. Ultimately, the study still leaves room for hope. First, reliable detection of warfarin allows use of the test in specific circumstances. Second, this was the first work reporting application of these types of tests for evaluating rodenticide intoxication in small animal medicine; it is probably a matter of time before further refinement makes these tests successful.—*Nuno Félix, MD, DVM, MSc (Neuroscience), PhD candidate*

Source

Evaluation of a point-of-care anticoagulant rodenticide test for dogs. Istvan SA, Marks SL, Murphy LA, Dorman DC. *JVECC* 24:168-173, 2014.

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