Insulin Lispro in Cats with Diabetic Ketoacidosis

Andrew C. Bugbee, DVM, DACVIM
University of Georgia

In the Literature

Malerba E, Mazzarino M, Del Baldo F, et al. Use of lispro insulin for treatment of diabetic ketoacidosis in cats. *J Feline Med Surg.* 2019;21(2):115-124.

Lispro cannot be considered equivalent to regular insulin when given intramuscularly or subcutaneously without further studies done in cats.

FROM THE PAGE ...

Historically, intravenous or intramuscular short-acting regular insulin formulations have been the mainstay therapy in the emergent stabilization of cats with diabetic ketoacidosis (DKA). Although insulin manufacturers have made no claims of imminent discontinuation of regular insulin production, the authors of the current study provide data for an alternative protocol to regular insulin for feline DKA management. Insulin lispro is a new-generation, short-acting insulin that is more rapidly absorbed in humans following subcutaneous injection and contributes to improved diabetic control as compared with regular insulin.[1] When administered intravenously, lispro exhibits a similar pharmacokinetic profile as regular insulin[2]; however, modifications to lispro allow for more rapid absorption as compared with unaltered human insulin. A single study in dogs with DKA showed a reduction in hospitalization time when lispro was used as compared with regular insulin, but no studies have been done in cats.[3]

Fifteen cats were enrolled in this study, representing 18 treated DKA episodes. Cats enrolled early during the study period (before 2012) were managed with regular insulin, then were managed with lispro from 2012 to 2014, and finally alternated between regular or lispro treatments until the study groups were complete. Both insulin preparations were administered as constant-rate infusions using the same rate and a dextrose supplementation chart to guide therapy during hospitalization. Variables assessed between groups included time to resolution of hyperglycemia, ketosis, acidosis, and ketoacidosis; time to transition to subcutaneous insulin; and duration of hospitalization.

There were no statistical differences between groups based on signalment or initial serum chemistry findings and no statistical differences between insulin treatments regarding time to control of hyperglycemia or resolution of ketosis, acidosis, or DKA overall. There were

also no significant differences in time to transition to subcutaneous insulin or overall duration of hospitalization. Although not specifically stated as an aim of the study, when the authors split the cats into newly diagnosed or chronically insulin-treated, the newly diagnosed diabetics had a significantly faster resolution of acidosis regardless of insulin type used.

Although both insulin preparations were well-tolerated, adverse effects included hypokalemia in all 18 DKA episodes; 2 episodes of subclinical hypoglycemia, both in the regular insulin group (glucose, <80 mg/dL); and 3 cases of hypophosphatemia requiring supplementation (2 in the regular insulin group and 1 in the lispro group).

… TO YOUR PATIENTS

Key pearls to put into practice:

1. Lispro, administered using a previously published constant-rate infusion protocol for regular insulin, is a safe and efficacious therapy for feline DKA management.
2. Adverse effects of lispro are similar to regular insulin, with hypokalemia, hypophosphatemia, and hypoglycemia most commonly encountered.
3. Lispro cannot be considered equivalent to regular insulin when given intramuscularly or subcutaneously without further studies done in cats.
4. Even with a recent manufacturer-based price reduction, lispro is currently more expensive than most regular insulin preparations.

References

1. Howey DC, Bowsher RR, Brunelle RL, Woodworth JR. [Lys(B28), Pro(B29)]-human insulin. A rapidly absorbed analogue of human insulin. *Diabetes*. 1994;43(3):396-402.
2. Stiller R, Kothny T, Gudat UHK, Anderson JH, Seger M, Johnson RD. Intravenous administration of insulin lispro versus regular insulin in patients with type 1 diabetes. *Diabetes*. 1999;48(5):SA115.
3. Sears KW, Drobatz KJ, Hess RS. Use of lispro insulin for treatment of diabetic ketoacidosis in dogs. *J Vet Emerg Crit Care (San Antonio)*. 2012;22(2):211-218.

Research Note: **Hair & Saliva Testing for Identification of Allergic Dogs**

This study evaluated the ability of a commercial hair and saliva allergy test to correctly identify allergic and non-allergic dogs through comparison of test results with a veterinary dermatologist's diagnosis. Fur and saliva samples were submitted from a known allergic dog and a known nonallergic dog; fake fur and saliva samples were also submitted. Replicate samples from the allergic and nonallergic dogs were also used to evaluate reproducibility of the test. The distribution of sample test results for allergic, nonallergic, and fake dogs was no different than what the distribution due to random chance would have been. Reproducibility was found to be poor to slight. In addition, particular allergens were overrepresented as "bad" and others as "good" across all samples, suggesting a systematic bias in allergen reporting. The authors concluded that hair and saliva testing is not a substitute for veterinary-directed allergy evaluation and diagnostics and should not be used for diagnosis of allergies in dogs.

Source

Coyner K, Schick A. Hair and saliva test fails to identify allergies in dogs. *J Small Anim Pract*. 2019;60(2):121-125.

The authors concluded that hair and saliva testing is not a substitute for veterinary-directed allergy evaluation and diagnostics and should not be used for diagnosis of allergies in dogs.