

Monitoring Canine Diabetic Ketoacidosis Patients

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In the Literature

Malerba E, Cattani C, Del Baldo F, et al. Accuracy of a flash glucose monitoring system in dogs with diabetic ketoacidosis. *J Vet Intern Med.* 2020;34(1):83-91.

FROM THE PAGE ...

Glycemic monitoring is a cornerstone of managing diabetic ketoacidosis (DKA) and is generally performed using portable blood glucose meters. Minimally invasive flash glucose monitoring systems (FGMSs) continuously measure interstitial blood glucose (IG) concentrations. IG can be evaluated as often as every minute through FGMSs, but the sensor needs to be scanned with a reader to obtain a measurement rather than having the glucose continuously displayed (as with continuous glucose monitoring). IG has been shown to closely reflect circulating blood glucose concentrations in steady state conditions, but when blood glucose rapidly increases or decreases, IG lags and will be lower or higher, respectively.^{1,2} The FGMS has recently been evaluated in uncomplicated diabetic dogs but not in dogs with DKA.³

In this study, the performance of an FGMS was assessed in 14 dogs with DKA, during the DKA crisis and after its resolution. IG measurements obtained with the FGMS were compared with blood glucose concentrations obtained via a validated portable blood glucose meter. BCS, lactate concentration, severity of ketosis, acidosis, and time wearing the device were evaluated for their effects on sensor accuracy.

The FGMS provided clinically accurate estimates of blood glucose concentration as compared with the portable blood glucose meter and can be a useful device for monitoring blood glucose concentration in critically ill dogs with DKA. Changes in metabolic variables (eg, acid-base status, ketosis, lactate concentrations), BCS, and time wearing the device did not seem to influence sensor accuracy. Application of the FGMS appeared to be painless and easy to perform and was well tolerated by all dogs. No relevant adverse events were recorded. One dog had mild erythema at the application site that resolved spontaneously within 24 hours of removal.

Further studies are required to evaluate precision, effects of hydration status, skin and SC adipose tissue thickness at the site of application, and location of the sensor on the accuracy of the device.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** FGMSs are less invasive than portable blood glucose meters and have acceptable clinical accuracy. They can minimize pain and prevent complications secondary to frequent phlebotomies (eg, iatrogenic anemia), particularly in small-breed dogs and cats. They are cost effective and productive for ≤ 2 weeks.
- 2** FGMSs provide IG results every minute across a wide range of glucose concentrations between 40 mg/dL and 500 mg/dL. Glucose readings are stored every 15 minutes for ≤ 8 hours on the sensor and uploaded to the reader when scanned, allowing pattern and trend generation that can be used to guide treatment decisions. The authors of this review article discharge their DKA patients wearing the FGMS to optimize insulin dosing in the subsequent 1 to 2 weeks.
- 3** Evaluating blood glucose concentration with a validated portable blood glucose meter is strongly recommended when unexpected or low FGMS results (< 70 mg/dL) are obtained.

References

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2. Cengiz E, Tamborlane WV. A tale of two compartments: interstitial versus blood glucose monitoring. *Diabetes Technol Ther*. 2009;11(1):S11-S16.
3. Corradini S, Pilosio B, Dondi F, et al. Accuracy of a flash glucose monitoring system in diabetic dogs. *J Vet Intern Med*. 2016;30(4):983-988.

Flash glucose monitoring systems are less invasive than portable blood glucose meters and have acceptable clinical accuracy.



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1. Data on file at Boehringer Ingelheim.

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