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Use of Continuous Glucose Monitoring system in Canine Diabetes

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Abstract

Glycemic control is crucial for managing diabetes mellitus (DM) and preventing complications. Continuous glucose monitoring systems (CGMS) are commonly used in humans with DM, providing real-time glucose levels and detecting hyperglycemic and hypoglycemic episodes. CGMS are increasingly prescribed to diabetic dogs and cats due to their well-tolerated nature. This article describes the use of CGMS in a dog with diabetes.

Keywords: Dog- diabetes- CGMS continuous glucose monitoring system

Glycemic control is crucial for managing diabetes mellitus (DM) and preventing complications in both human and veterinary medicine. Continuous glucose monitoring systems (CGMS) are commonly used in humans with DM, and clinical studies have shown their effectiveness in optimizing and titrating the insulin dosing and management of DM. CGMS measures interstitial concentration using a flexible sensor inserted into the skin. They provide real-time sensor glucose levels and allow detection of hyperglycemic and hypoglycemic episodes that might otherwise be undetected. The article describes use of CGMS in canine DM.

The present study was initiated after permission from the Institutional Ethics Committee for Veterinary Clinical Research (IEC-VCR) of Mumbai Veterinary College, Maharashtra Animal and Fishery Sciences University (MAFSU), Mumbai-India.

Sl No.	Patient details	Chief complaints	Laboratory investigations
1	Age: 05 years, 9 months; Sex: Male; Breed: Labrador; Body weight: 38 kg.	Polydipsia and polyuria.	Fasting blood glucose: 501 mg/dl; fructosamine: 449.02 µmol/L Basal cortisol: 92.96 nmol/L TT_4=43.76 nmol/L. CBC, LFT, and KFT: unremarkable. Urinalysis: glycosuria but nil urine ketones

The CGMS does not require calibration, is accurate, and well tolerated by dogs, its placement was undertaken as per the methods outlined by Tardo *et al*. (2024). A small patch of hair (approximately 3cm x 3cm) is shaved on the lateral thoracic region. The skin was cleaned of excess hair and wiped with an alcohol swab. The sensor and attached stylet were inserted through the skin. After placement of the sensor, the reading with the mobile software was undertaken after one hour. In the present clinical case, installation of the sensors proceeded without any pain reaction, and after removal of the sensor, no skin erythema was observed. The installation of CGMS and its reading are presented in Fig 1 to 3. Interstitial glucose data was automatically calculated by CGMS on the mobile application software. In 14 days, the insulin dose was titrated. Patient was stabilized (range of blood glucose 160 mg/dl to 250 mg/dl) with a soluble insulin dose of 10 units twice a day and 14 units of insulin glargine (100 IU/ml) at bedtime. CGMS wireless system provides a continuous display of interstitial glucose concentration, minimizing patient handling needs. It enabled clinicians to detect trends and quickly identify glucose fluctuations without repeated phlebotomies. The other advantages of this device are, it has an 8-hour window, connects three devices (patient, caretaker, and physician), and alarm alerts for hypoglycaemia. CGMS is a well-tolerated and pet-friendly tool for monitoring glucose levels at

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home. However, the CGMS for veterinary patients has limitations, including an inability to record glucose concentrations and complete data when detached, necessitating further research for accurate diabetes management.

Conflict of Interest declaration

The authors declare no conflict of interest.

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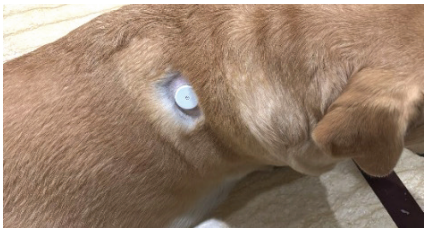

Fig. 1: Placement of CGMS in a dog at the lateral thoracic region

Fig. 2: CGMS sensor

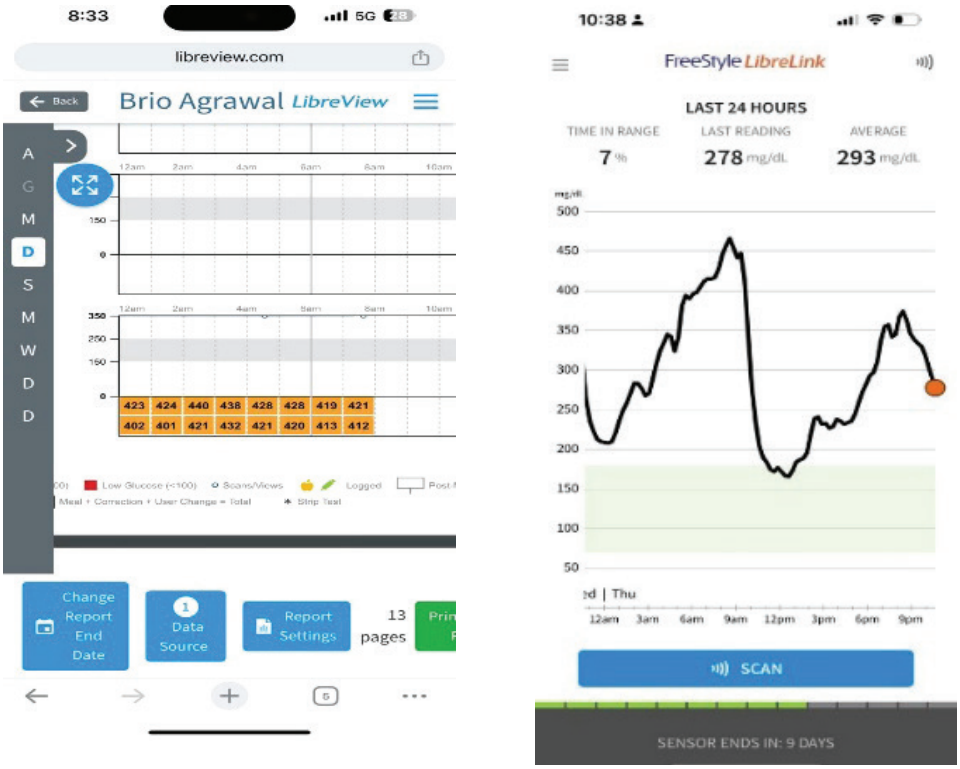

Fig. 3: CGMS reading on mobile app during insulin dose titration

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