

Glucose overload -The Diabetic dog and management clinics

(By Fiona Burke-Linnane, RVN, Glenina Veterinary Clinic, Galway)

The Pancreas gland is an organ that consists of exocrine and endocrine cells that produce both glucagon and insulin hormones. These hormones maintain blood glucose levels in the body and also power fat, carbohydrate and protein metabolism. In particular, insulin helps glucose move from the blood stream into the cells of the body where it can be used for energy.

Diabetes Mellitus is a common hormonal illness in dogs which may be caused by several factors. The inadequate insulin production or performance seen with this disease, gives rise to high blood sugar levels within the body. Once blood glucose levels are exceeded, this jeopardises the renal threshold and results in glucose being excreted in the urine.

Clinical symptoms

Patients may present because they show acute weight loss (due to protein breakdown) despite having a good appetite. They may tire quickly or show signs of weakness; this is due to failure of cells to upload glucose for energy needs. Another symptom is polyuria (increased urination) and polydypsia (increased thirst to make up for the loss of fluid). Frequent urinary infections are common due to glucose levels in the urine. When the condition has existed for a prolonged period, pruritis (skin infection), alopecia, cataracts and a sweet smell on the breath may be observed. In advanced cases a patient may collapse in a ketotic state (shaking, fitting), become dehydrated and may vomit, this is very serious and these dogs require urgent medical attention.

Diagnosis:

Based on the clinical symptoms, a complete blood count, chemistry panel, urinalysis and urine culture are generally preformed to diagnose the condition. Findings of high glucose levels in the blood and urine means that further blood testing may be carried out to determine the treatment.

Treatments:

Diabetes Mellitus cannot be cured but can be treated.

The treatment of choice is the subcutaneous administration of insulin. Regular treatment with the correct dose is absolutely essential to halt the progression of the disease. A periodic check on the urine for sugar, and at intervals, on the blood sugar also will ensure that the insulin dose remains adequate. Insufficient dosing may be recognised by increased thirst whereas overdosing is seen as an uncertain gait and perhaps even falling. Overtime it may be possible to reduce the amounts of insulin required by the patient.



Determining the correct insulin dose

A Glucose curve is a graph that is used to measure the response to insulin therapy in order to stabilise the diabetic patient. Insulin is administered and Blood samples are taken at intervals over a 24 hour period .This is done to show the highest and lowest levels of glucose in the blood in order to help determine the insulin dose required by the individual patient. This is often performed throughout the life time of the patient to ensure that the blood glucose levels are stable.

Management clinics

Many Veterinary practices now run numerous nursing clinics to support owners and their pets at various life stages and management of many disorders. The diabetic support clinic includes monitoring initial adjustments to insulin, demonstrating insulin administrative technique, urine testing, general help, counselling and most importantly, blood glucose estimations. These estimations are performed using a glucometer which requires only a drop of blood and makes frequent accurate blood glucose monitoring possible. This is useful during stabilisation periods and quick checks during routine outpatient clinics.



Example of Diabetes monitoring chart

Date	Food & Time	Fluid intake	Insulin dose & time	Blood Glucose	Urine Sample Results

Topics that are often discussed:

Diet change – A general maintenance diet is often high in sugar content therefore it is advisable to change onto a clinical diet to aid in blood glucose stabilisation. As obesity and diabetes are often linked, diets that are high in fibre promote weight loss and also help manage blood sugar levels by slowing the raised glucose levels after a meal. It is very important that accurate amounts of food are given at specific times in order to avoid blood glucose fluctuations.

Exercise - another thing that may cause fluctuations is a variation in exercise routine; therefore it is important that the dog is exercised at the same time and for the same distance each day.

Neutering - entire females' i.e. non neutered females, may become unstable on subsequent oestrous cycles. Due to the increased hormone levels at this time.

The outcome of Diabetes Mellitus depends mainly on the cause, an early diagnosis, adequate therapy and owner compliance. It is vital that the owner and veterinary practice work closely together and therefore the majority of diabetic patients can be brought to a stable condition.

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