



Diabetes

Diabetes is a relatively common disease seen in dogs and cats and is characterized by elevated levels of blood glucose from an insulin deficiency. There are several predisposing factors that can lead to diabetes including, obesity, chronic pancreatitis, genetics, etc. Management does require long term care by the owner, but once a routine is established, many pets can live long happy lives.

There are three types of diabetes mellitus.

Type I Insulin-dependent

- Lack of insulin production by the pancreas beta cells
- Most commonly caused by an autoimmune disease
- Most common form in dogs
- Lifelong external insulin supplementation is required.

Type II Noninsulin-dependent

- Impaired insulin secretion by dysfunctional beta cells in the pancreas
- Peripheral insulin resistance
- Sometimes reversible and can go into remission.
- Occurs in cats, but not dogs.

Type III Gestational, hormone induced insulin resistance.

- Associated with high levels of progesterone or other hormones.
- Occurs in both dogs and cats.

Causes

There are several underlying causes of diabetes. The three most common include:

Immune Mediated Diseases – Common in dogs, this process leads to destruction of the insulin producing pancreatic beta cells.

Pancreatitis – Chronic pancreatitis can cause progressive destruction of insulin-producing beta pancreatic cells.

Genetics – Not well defined, genetics has been found to predispose pets to diabetes.

History

The most common sign of diabetes is pets will drink and urinate more. Pets may hang over the water bowl and drink all day.

Many pets with diabetes are overweight with sudden or gradual weight loss. Some will eat more, while others may vomit with diarrhea and abdominal pain. Cataracts are common in dogs while muscle weakness causing dropped hocks with a plantigrade stance is common in cats.

Diagnosis

Elevated fasting blood glucose levels is the hallmark finding with diabetes. Glucose in the urine supports diabetes when the kidney threshold is surpassed and it “spills over” into the urine. Other tests including cultures, fructosamine levels, pancreatic lipase, are available to help guide diagnosis. The A1C test is used in human medicine, but not used commonly in veterinary medicine.

Treatment

The current mainstay treatment of diabetes in our pets is diet and insulin. Few diabetics can be managed with diet alone and require insulin long term. Your veterinarian will develop the best management protocol based on your pet's needs.

Oral medications – Few oral products are available but are not frequently used in veterinary medicine.

Insulin – Insulin is almost always required in dogs and cats to control diabetes. It is usually given twice a day matching the feeding schedule. It is important to note the U-rating for the insulin as the syringes are specific and must match.

Dogs

- NPH – Human recombinant insulin U-100
- Lente – Porcine zinc insulin U-40
- PZI – Protamine zinc human recombinant insulin U-40
- Others - Detemir, Glargine, AKS/218d

Cats

- Glargine – Human analogue insulin U-100
- PZI – Protamine zinc human recombinant insulin U-40
- Lente – Porcine zinc insulin U-40
- Others – Detemir, NPH

Diets – Several prescription diets are available to aid in the management of diabetes. Feeding twice a day at 12-hour intervals is best to obtain the best glucose regulation. Diet monitoring is critical as the insulin dose will be adjusted to the amount and schedule of the feedings. Abrupt feeding changes can cause detrimental effects to blood glucose levels.

Therapy of Concurrent Diseases – Concurrent diseases can contribute to insulin resistance and make management difficult. If your pet is showing signs of other diseases or is having a hard time regulating on insulin, looking into other disease process is warranted. A few examples include acromegaly, hyperadrenocorticism, kidney disease, pancreatitis, heart disease, chronic infections, etc.

Monitoring

There are several methods to monitor diabetes. Working with your veterinarian to find what works best in your situation will help ease the stress of management.

- **Clinical Signs** – Owners monitor for decreased clinical signs. If signs return, this indicates a potential problem.
- **Blood Glucose Curve** – Patient is hospitalized for a day and blood glucose levels are checked every 2 hours throughout the day.
- **Spot Glucose Checks** – Patient is brought in the hospital for a blood glucose check at the nadir (trough)
- **Continuous Glucose Monitoring** – Subcutaneous sensor that continuously monitors levels and displays on monitor (I-phone)
- **Fructosamine Test** – Average blood glucose levels over the last 2-3 weeks
- **Urine Glucose Testing** – Urine glucose levels are monitored for “spill over”

Prognosis

Dogs-Except for type III (gestational) diabetes, remission does not occur in dogs and insulin must be given life-long. Average survival time after diagnosis is two years.

Cats - Remission in cats can sometimes be achieved and usually occurs 1-4 months after diagnosis. Although not necessarily permanent, low carbohydrate diets help with long term remission in cats.

Diabetes is disease that is managed rather than cured and requires diligent treatment and monitoring by the owner. Understanding the disease and developing a management protocol that works best for the pet and owner will greatly reduce the stress of the lifelong management. Good Luck!

