

Insulinoma in the Ferret

Insulinoma or pancreatic beta cell tumor is an abnormal growth of the pancreas that secretes excess amounts of insulin. Unfortunately, insulinoma is an extremely common disease of middle-aged to older ferrets. As insulin levels rise, blood sugar or blood glucose levels fall. Blood sugar is needed for the brain to function and for muscles to work normally.

Clinical Signs

Signs of falling blood glucose levels in the ferret may include a dazed, glassy-eyed stare, lethargy, weakness, collapse, and even seizures. Low blood glucose levels or hypoglycemia can also manifest as rear leg weakness and/or wobbliness in the ferret. Hypoglycemia is also often associated with nausea in the ferret. A nauseous ferret may drool or paw at its mouth vigorously.

Diagnosis

Insulinoma is so common in the older ferret that persistently low fasting blood glucose is highly suggestive of disease. High blood insulin levels are used in rare cases to confirm the diagnosis, and in some cases pancreatic nodules may be identified using ultrasound. A definitive diagnosis is obtained with a surgical biopsy.

Therapy

The treatment of choice for insulinoma is surgical removal of as much of the pancreatic tumor as possible. Unfortunately, there is no way to remove all tumor cells and even if entire sections of the pancreas are removed, signs of insulinoma will eventually recur. Within weeks to months, in rare cases years, medical management will become necessary.

Prednisone and diazoxide are most commonly used for medical management of insulinoma. Prednisone helps the body make blood sugar. Usually the dose of prednisone must be gradually increased as the disease progresses. Eventually prednisone alone is not enough to control signs of hypoglycemia, and diazoxide can be added. For a time, prednisone and diazoxide controls the signs of hypoglycemia, but eventually these medications will no longer be sufficient. Although there are experimental drugs available, there is no consistently reliable third medication that can be offered at this time.

Prognosis

Although surgical and medical management may control signs for a time, there is no known permanent cure for insulinoma. Eventually insulinoma leads to the death of the affected animal.

Home Care

1. Give all prescribed drugs as directed. Prednisone frequently increases water intake and appetite, so fresh water and litter pans must always be available.
2. Make sure high quality, high protein ferret or cat food is available at all times.
 - a. Avoid semi-moist foods, which are high in sugar.
 - b. Avoid sweet snacks as well. Ferrets are notorious for their “sweet tooth”.
Offering a ferret with insulinoma a sweet snack is analogous to a person eating a candy bar. First a “sugar high” occurs and the person feels full of energy, but this is followed by the all too familiar “crash” or decrease in blood sugar. The insulinoma ferret does not have the reserves to handle such a crash and severe signs of hypoglycemia may occur such as collapse or seizures.
3. Recognize situations that can use blood sugar, such as excitement, exercise, or stress.
 - a. Limit the amount of time that your ferret rough houses.
 - b. Encourage your pet to eat a high protein, high quality snack after exercise, excitement, and/or stress.
4. If signs of hypoglycemia are observed at home, encourage your pet to eat since this will help to stabilize blood glucose levels.
 - a. If severe weakness, collapse, or even seizures are observed and your pet is not capable of eating, rub sweet syrup (i.e. Karo syrup[®], Ach Food Companies) on the gums. Take care of being bitten if seizures are observed—use a cotton-tipped applicator rather than your fingers!
 - b. Once your pet is more alert, feed a high quality, high protein meal such as kibble or Lafeber Company’s Emerald Carnivore.
 - c. Contact a small mammal veterinarian immediately if signs of hypoglycemia persist or if seizures or collapse are observed.
5. Consider keeping a log that records episodes of hypoglycemia. This will help your veterinarian to best evaluate the efficacy of your ferret’s medication(s).