

HYPOGLYCEMIA (LOW BLOOD SUGAR)

BASICS

OVERVIEW

- Abnormally low blood glucose (sugar) concentration

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dog and cat

SIGNS/OBSERVED CHANGES in the ANIMAL

- Seizures
- Partial paralysis of the hindquarters or rear limbs (known as “posterior paresis”)
- Weakness
- Collapse
- Involuntary muscle twitches
- Abnormal behavior
- Sluggishness (lethargy) and depression
- Wobbly gait (known as “ataxia”)
- Increased appetite (known as “polyphagia”)
- Weight gain
- Increased urination (known as “polyuria” or “PU”) and increased thirst (known as “polydipsia” or “PD”)
- Exercise intolerance
- Some animals appear normal, aside from findings associated with underlying disease
- May have episodic signs

CAUSES

Endocrine

- Tumor involving cells of the pancreas that secrete the hormone, insulin (known as an “insulinoma”); excessive levels of insulin decrease the blood glucose levels
- Hormonal disturbances caused by cancer not involving the pancreas (known as “extrapancreatic paraneoplasia”)
- Overdose of prescribed insulin for treatment of diabetes (known as “iatrogenic insulin overdose”)
- Inadequate production of steroids by the adrenal glands (known as “hypoadrenocorticism” or “Addison’s disease”)

Hepatic Disease

- Portosystemic shunt (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver)
- Damage and scarring of the liver (known as “cirrhosis”)
- Severe inflammation of the liver (known as “hepatitis”)
- Glycogen-storage diseases—inherited disorders caused by a lack of normal enzymes to convert glycogen to glucose, resulting in greater than normal accumulation of glycogen in the liver; glycogen is the primary carbohydrate reserve in the body and is converted easily into glucose (sugar) under normal body conditions; it usually is found in the liver and other tissues in the body

Overuse of Glucose by the Body

- “Hunting-dog hypoglycemia” (condition seen in some hunting dogs, in which their blood glucose drops after one to two hours of strenuous exercise in the field)
- Pregnancy
- True increase in the number of red-blood cells in the body (known as “polycythemia”)
- Cancer
- Presence of pus-forming bacteria and their poisons in the blood or tissues (known as “sepsis”)

Reduced Intake/Underproduction of Glucose by the Body

- Young puppies and kittens
- Toy-breed dogs
- Severe malnutrition or starvation

RISK FACTORS

- Low intake of food for energy increases the likelihood of low blood sugar (hypoglycemia) in patients with conditions causing overuse of body glucose or underproduction of glucose by the body
- Fasting, excitement, exercise, and eating may or may not increase the risk of low blood sugar (hypoglycemic) episodes in patients with insulin-producing tumors (insulinomas)

TREATMENT

HEALTH CARE

- Treat animals with signs of low blood sugar (hypoglycemia) as inpatients
- Treat underlying disease
- If unable to eat, the veterinarian may start intravenous fluid therapy with 2.5% dextrose; if clinical signs persist, a 5% dextrose solution may be used

ACTIVITY

- Depends on underlying disease

DIET

- If able to eat (that is, the animal is responsive and is not vomiting), feeding should be part or all of initial treatment
- Hunting dog hypoglycemia—feed moderate meal of fat, protein, and complex carbohydrates a few hours before hunting; can feed snacks (such as dog biscuits) every 3 to 5 hours during the hunt
- Toy-breed hypoglycemia—increase frequency of feeding; feed several meals a day, as directed by your pet's veterinarian
- Puppy and kitten hypoglycemia—increase frequency of feeding (nursing or hand feeding)

SURGERY

- Surgery is indicated if a portosystemic shunt (condition in which abnormal blood vessels allow blood to flow between the portal vein [vein that normally carries blood from the digestive organs to the liver] and the body circulation without first going through the liver) or insulinoma (tumor involving cells of the pancreas that secrete the hormone, insulin) is the cause of hypoglycemia

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

Emergency/Acute Treatment

- In hospital—administer 50% dextrose
- At home—do not attempt to administer medication by mouth during a seizure; seizures related to low blood sugar (known as “hypoglycemic seizures”) usually stop within 1 to 2 minutes; if a seizure is prolonged, recommend transportation to hospital; if a short seizure has ended or other signs of extremely low blood sugar (known as a “hypoglycemic crisis”) exist, recommend rubbing corn syrup or 50% dextrose on the tissues of the mouth, lining the cheek, and then followed by giving the same solution by mouth once the patient can swallow; then seek immediate veterinary medical attention
- Initiate frequent feeding of a diet low in simple sugars or, if patient is unable to eat, intravenous fluid therapy with 2.5% dextrose

FOLLOW-UP CARE

PATIENT MONITORING

- At home—for return or progression of clinical signs of low blood sugar (hypoglycemia); assess glucose levels on blood tests, if signs recur
- Single, intermittent serum glucose determinations may not truly reflect the effect of different foods on blood glucose (sugar) levels (known as “glycemic status”) of the patient
- Other monitoring is based on the underlying disease

PREVENTIONS AND AVOIDANCE

- Hunting dog hypoglycemia—feed moderate meal of fat, protein, and complex carbohydrates a few hours before hunting; can feed snacks (such as dog biscuits) every 3 to 5 hours during the hunt
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POSSIBLE COMPLICATIONS

- Recurrent, progressive episodes of low blood sugar (hypoglycemia)
- Seizures

EXPECTED COURSE AND PROGNOSIS

- Depends on underlying disease

KEY POINTS

- Abnormally low blood glucose (sugar) concentration
- Treat animals with signs of low blood sugar (hypoglycemia) as inpatients
- Treat underlying disease
- Low intake of food for energy increases the likelihood of low blood sugar (hypoglycemia) in patients with conditions causing overuse of body glucose or underproduction
- Fasting, excitement, exercise, and eating may or may not increase the risk of low blood sugar (hypoglycemic) episodes in patients with insulin-producing tumors (insulinoma)

