

DIABETES INSIPIDUS (“WATER DIABETES”)

BASICS

OVERVIEW

• Diabetes insipidus is a disorder of water metabolism characterized by excessive urination (polyuria) and excessive thirst (polydipsia); the urine is very watery with low levels of dissolved substances (such as salt)—the urine is described as having a low specific gravity or osmolality on the urinalysis; so-called “insipid urine” or “tasteless urine”

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dog and cat

Mean Age and Range

- Congenital (present at birth) forms—less than 1 year of age
- Acquired (condition develops at some time after birth) forms (such as caused by cancer or trauma or for unknown reasons [known as “idiopathic”])—any age

SIGNS/OBSERVED CHANGES in the ANIMAL

- Excessive urination (polyuria)
- Excessive thirst (polydipsia)
- Inability to control urination (incontinence)—occasional

CAUSES

Two general types of diabetes insipidus have been identified, based on the location of the water metabolism defect. One type is known as “central diabetes insipidus” in which the pituitary gland does not produce enough antidiuretic hormone (ADH). Antidiuretic hormone normally is involved in regulating water balance in the body. Antidiuretic hormone acts on the kidney to increase the amount of water reabsorbed so that normal levels of fluid are present in the blood. If the body has too much fluid present, the pituitary does not secrete ADH so the kidney does not reabsorb as much water, and more water enters the urine and is eliminated from the body. The other type is called “nephrogenic diabetes insipidus.” Nephrogenic refers to the kidney itself. In this type of diabetes insipidus, the kidney does not respond to the ADH, such that the kidney does not reabsorb water and excessive urine is produced.

Inadequate Secretion of ADH by the Pituitary Gland (Central Diabetes Insipidus)

- Congenital defect
- Unknown problem in the pituitary gland (idiopathic)
- Trauma to the brain/pituitary gland
- Cancer

Kidney Insensitivity to ADH (Nephrogenic Diabetes Insipidus)

- Congenital
- Secondary to drugs (such as lithium, demeclocycline, and methoxyflurane)
- Secondary to hormone/endocrine and metabolic disorders (such as excessive production of steroids by the adrenal glands [hyperadrenocorticism], low potassium levels in the blood [hypokalemia], accumulation of pus in the uterus [pyometra], and high calcium levels in the blood [hypercalcemia])
- Secondary to kidney disease or infection (such as inflammation and/or infection of the kidney [known as “pyelonephritis”], chronic kidney failure, kidney disease related to accumulation of pus in the uterus [pyometra])

TREATMENT

HEALTH CARE

• Patients should be hospitalized for the modified water deprivation test; the ADH trial uses synthetic antidiuretic hormone administered to the pet to determine if the kidneys will respond—it often is performed as an outpatient procedure

ACTIVITY

- Not restricted

DIET

- Normal, with free access to water at all times

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.

- Central diabetes insipidus—desmopressin acetate or DDAVP is a synthetic antidiuretic hormone; intranasal and oral preparations are available; your pet's veterinarian will determine the type to be used and the route of administration
- Nephrogenic diabetes insipidus—hydrochlorothiazide
- Chlorpropamide (Diabinese®) may reduce excessive urination and thirst in cases of central diabetes insipidus

FOLLOW-UP CARE

PATIENT MONITORING

- Treatment is adjusted according to the patient's signs; the ideal dosage and frequency of DDAVP administration is based on water intake
- Laboratory tests, such as packed cell volume (PCV), total solids, and serum sodium concentration to detect dehydration (could indicate inadequate DDAVP replacement)

PREVENTIONS AND AVOIDANCE

- Avoid circumstances that might increase water loss markedly
- Ensure free access to water at all times to prevent dehydration

POSSIBLE COMPLICATIONS

- Complications of primary disease (for example, pituitary tumor)

EXPECTED COURSE AND PROGNOSIS

- The condition is usually permanent, except in rare patients in which the condition was trauma induced
- Prognosis is generally good, depending on the underlying disorder
- Without treatment, dehydration can lead to stupor, coma, and death

KEY POINTS

- Diabetes insipidus is a disorder of water metabolism characterized by excessive urination (polyuria) and excessive thirst (polydipsia); the urine is very watery with low levels of dissolved substances (such as salt)
- Ensure free access to water at all times to prevent dehydration

