DIABETES INSIPIDUS

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Definition

Diabetes insipidus (die-uh-BEE-teze in-SIP-uh-dus) is an uncommon disorder characterized by intense thirst, despite the drinking of fluids (polydipsia), and the excretion of large amounts of urine (polyuria). In most cases, it's the result of your body not properly producing, storing or releasing a key hormone, called ADH, but diabetes insipidus can also occur when your kidneys are unable to respond properly to that hormone. Rarely, diabetes insipidus can occur during pregnancy (gestational diabetes insipidus).

You may assume diabetes insipidus and diabetes mellitus(the more common form of diabetes involving blood sugar) are related. Although the disorders share a name and have some common signs, diabetes mellitus (type 1 and type 2) and diabetes insipidus are unrelated.

Treatments are available to relieve your thirst and normalize your urine output.

Symptoms

The most common signs and symptoms of diabetes insipidus are:

- Extreme thirst
- Excretion of an excessive amount of diluted urine

Depending on the severity of the condition, urine output can range from 2 quarts (about 2 liters) a day if you have mild diabetes insipidus to 21 quarts (about 20 liters) a day if the condition is severe and if you're drinking a lot of fluids. In comparison, the average urine output for a healthy adult varies, but is in the range of 1.6 to 2.6 quarts (about 1.5 to

2.5 liters) a day. Other signs may include needing to get up at night to urinate (nocturia) and bed-wetting.

Infants and young children who have diabetes insipidus may have the following signs and symptoms:

- Unexplained fussiness or inconsolable crying
- Unusually wet diapers
- Fever, vomiting or diarrhea
- Dry skin with cool extremities
- Delayed growth
- Weight loss

When to see a doctor

See your doctor immediately if you notice the two most common signs of diabetes insipidus: excessive urination and extreme thirst.

Causes

Diabetes insipidus occurs when your body can't regulate how it handles fluids. Normally, your kidneys remove excess body fluids from your bloodstream. This fluid waste is temporarily stored in your bladder as urine, before you urinate. When your fluid regulation system is working

properly, your kidneys make less urine when your body water is decreased, such as through perspiration, to conserve fluid.

The volume and composition of your body fluids remain balanced through a combination of oral intake and excretion by the kidneys. The rate of fluid intake is largely governed

by thirst, although your habits can increase your intake far above the amount necessary. The rate of fluid excreted by your kidneys is greatly influenced by the production of anti-diuretic hormone (ADH), also called vasopressin.

Your body makes ADH in the hypothalamus and stores the hormone in your pituitary gland, a small gland located in the base of your brain. ADH is released into your bloodstream when your body starts to become dehydrated. ADH then concentrates the urine by triggering the kidney tubules to release water back into your bloodstream rather than excreting as much water into your urine.

The way in which your system is disrupted determines which form of diabetes insipidus you have:

- Central diabetes insipidus: The cause of central diabetes insipidus in adults is usually damage to the pituitary gland or hypothalamus, most commonly due to surgery, a tumor, an illness (such as meningitis), inflammation or a head injury. For children, the cause is often an inherited genetic disorder. In some cases the cause is unknown. This damage disrupts the normal production, storage and release of ADH.
- Nephrogenic diabetes insipidus: Nephrogenic diabetes insipidus occurs when there's a defect in the kidney tubules — the structures in your kidneys that cause water to be excreted or reabsorbed. This defect makes your kidneys unable to properly respond to ADH. The defect may be due to an inherited (genetic) disorder or a chronic kidney disorder. Certain drugs, such as lithium and demeclocycline (a tetracycline antibiotic), also can cause nephrogenic diabetes insipidus.
- Gestational diabetes insipidus: Gestational diabetes insipidus occurs only during pregnancy and when an enzyme made by the placenta — the system of blood vessels and other tissue that allows the exchange of nutrients and waste products between a mother and her baby - destroys ADH in the mother.
- Primary polydipsia: This condition , also known as dipsogenic diabetes insipidus or psychogenic polydipsia can cause excretion of large volumes of dilute urine. Rather than a problem with ADH production or damage, the underlying cause is intake of excessive fluids. Prolonged excessive water intake by itself can damage the kidneys and suppress ADH, making your body unable to concentrate urine. Primary polydipsia can be the result of abnormal thirst caused by damage to the thirst-regulating mechanism, situated in the hypothalamus. Primary polydipsia can also be caused by mental illness.

In some cases of diabetes insipidus, doctors never determine a cause.

Risk factors

Nephrogenic diabetes insipidus that's present at or shortly after birth usually has a genetic cause that permanently alters the kidney's ability to concentrate the urine. Nephrogenic diabetes insipidus usually affects males, through women who can pass the gene on to their children.

Complications

Dehydration

Except for primary polydipsia, which causes you to retain too much water, diabetes insipidus can cause your body to retain too little water to function properly, and you can become dehydrated. Dehydration can cause:

- Dry mouth
- Sunken appearance to your eyes
- Muscle weakness
- Fever
- Low blood pressure (hypotension)
- Headache
- Elevated blood sodium (hypernatremia)
- Rapid heart rate
- Weight loss
- Electrolyte imbalance

Diabetes insipidus can also cause an electrolyte imbalance. Electrolytes are minerals in your blood — such as sodium and potassium — that maintain the balance of fluids in your body. Electrolyte imbalance can cause symptoms, such as:

- Fatigue or lethargy
- Loss of appetite
- Irritability
- Muscle pains
- Nausea

Tests and diagnosis

Since the signs and symptoms of diabetes insipidus can be caused by other conditions, your doctor will perform a number of tests. If your doctor determines you have diabetes insipidus, he or she will need to determine which type of diabetes insipidus you have, because the treatment is different for each form of the disease.

Some of the tests doctors commonly use, to diagnose and determine the type of diabetes insipidus and in some cases, its cause, include:

Water deprivation test: This test confirms the diagnosis and helps determine the cause of diabetes insipidus. You'll be asked to stop drinking fluids several hours before the test so that your doctor can measure changes in your body weight, urine output and the concentration of your urine and blood when fluids are withheld. Your doctor may also measure blood levels of ADH or administer synthetic ADH during this test. The water deprivation test is performed under close supervision in children and pregnant women to make sure no more than 5 percent of body weight is lost during the test.

- Urinalysis: Urinalysis is the physical and chemical examination of urine. If your urine is less concentrated — meaning the amount of water is high relative to other excreted substances — it could be due to diabetes insipidus.
- Magnetic resonance imaging (MRI): An MRI of the head is a noninvasive procedure that uses a powerful magnetic field and radio waves to construct detailed pictures of brain tissues. Your doctor may want to perform an MRI to look for abnormalities in or near the pituitary gland.

Genetic screening

If your doctor suspects an inherited form of diabetes insipidus, he or she will look at your family history of polyuria and may suggest genetic screening.

Lifestyle and home remedies

If you have diabetes insipidus:

- Prevent dehydration. As long as you take your medication and have access to water when the medication's effects wear off, you'll prevent serious problems. Plan ahead by carrying water with you wherever you go, and keep a supply of medication in your travel bag, at work or at school.
- Wear a medical alert bracelet or carry a medical alert card in your wallet: If you have a medical emergency, a health care professional will recognize immediately your need for special treatment.

Source: The Mayo Clinic

Contact us

Please feel free to contact your Aon Healthcare Consultant if you have any concerns. You may also contact the **Aon Resolution Centre on 0860 835 272 or e-mail: arc@aon.co.za** for further information.

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